NAVFAC
Naval Facilities Engineering Command

Groundwater Sample Results, Electronic Data Deliverable, Data Validation Report, and the Sample Location Report, SDG 16C129

Naval Air Warfare Center Weapons Division China Lake
China Lake, California

November 2019

facility_id	facility_code	sys_loc_code	sys_sample_code	sample_name	sample_date	sample_type_code	start_depth	end_depth	depth_unit	matrix_code	task_code	field_sdg	parent_sample_code	analysis_location	lab_sample_id	lab_matrix_code	lab_name_code	analytic_method	analysis_date
10177	NAWS China Lake	FQC	KCH067-042	KCH067-042	3/15/2016	SB				WQ	PLOU	16C129		LB	K1602709-001	W	CASK	E537	3/30/2016
10177	NAWS China Lake	FQC	KCH067-042	KCH067-042	3/15/2016	SB				WQ	PLOU	16C129		LB	K1602709-001	W	CASK	E537	3/30/2016
10177	NAWS China Lake	FQC	KCH067-042	KCH067-042	3/15/2016	SB				WQ	PLOU	16C129		LB	K1602709-001	W	CASK	E537	3/30/2016

column_number	fraction	test_type	prep_method	leachate_method	lab_sdg	percent_moisture	dilution_factor	test_id	cas_rn	chemical_name	organic_yn	report_result_text	report_result_value	report_result_unit	report_result_limit	reportable_result	detect_flag
NA	T	INITIAL	SW3535A		K1602709		1	1794715	335-67-1	Perfluorooctanoic acid - PFOA	Y	< 0.80	0.8	ng/L	0.80	Yes	N
NA	T	INITIAL	SW3535A		K1602709		1	1794715	45187-15-3	Perfluorobutane Sulfonate - PFBS		< 1.2	1.2	ng/L	1.2	Yes	N
NA	T	INITIAL	SW3535A		K1602709		1	1794715	45298-90-6	Perfluorooctane sulfonate - PFOS		< 1.2	1.2	ng/L	1.2	Yes	N

interpreted_qualifiers	validator_qualifiers	lab_qualifiers	quantitation_limit	method_detection_limit	reporting_detection_limit	detection_limit_unit	approval_code	result_text	result_numeric	result_unit	result_type_code
U	U	J	4.3	0.27	0.80	ng/L	07	0.80	0.8	ng/L	TRG
U		U	4.3	0.41	1.2	ng/L				ng/L	TRG
U		U	4.3	0.60	1.2	ng/L				ng/L	TRG

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

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439
ATTN: Ms. Karin Kaiser

May 25, 2016

SUBJECT: China Lake, CTO 067, Data Validation

Dear Ms. Kaiser,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on May 2, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #36282:

SDG #	Fraction
16C070 16C074 16C129 78915 78998 K1602494 K1602709	Volatiles, PAHs, Chlorinated Pesticides, PCBs, Metals, TPH as Gasoline, TPH as Extractables, Explosives, Perchlorate, Polychlorinated Dioxins/Dibenzofurans, Perfluorinated Alkyl Acids

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

- Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43 and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California , February 2016
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.0, July 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, August 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, August 2014
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Hold HC & CD for KK approval- EM;

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

Sincerely,

Pei Geng
Project Manager/Senior Chemist

6,096 pages-SF

Attachment 1

EDD Client Select IV

LDC #36282 (Kleinfelder-Evergreen, CO / China Lake, CTO 067)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260B)		PAHs (8270C-SIM)		Pest. (8081A)		PCBs (8082)		Metals (6020A/7470A)		TPH-G (8015B)		TPH-E (8015B)		Dioxins (8290A)		Expl. (8330A)		CLO_4 (6850)		PFCs (537M)		Cr(VI) (7199)													
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	16C070	05/02/16	05/16/16	1	8	0	3	0	3	0	3	0	23	1	8	0	17	-	-	0	13	0	13	-	-	0	16												
A	16C070	05/02/16	05/16/16	0	2	0	1	0	1	0	1	0	4	0	2	0	2	-	-	0	1	0	1	-	-	0	2												
B	16C074	05/02/16	05/16/16	2	0	1	0	1	0	1	0	1	0	2	0	1	0	-	-	1	0	1	0	-	-	1	0												
C	16C129	05/02/16	05/16/16	2	0	2	1	2	14	1	0	2	9	2	0	2	1	-	-	2	8	2	8	-	-	2	1												
C	16C129	05/02/16	05/16/16	0	0	0	1	0	2	0	0	0	2	0	0	0	1	-	-	0	1	0	1	-	-	0	1												
D	78915	05/02/16	05/16/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	13	-	-	-	-	-	-	-	-												
D	78915	05/02/16	05/16/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	-	-	-	-	-	-	-	-												
E	78998	05/02/16	05/16/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-												
E	78998	05/02/16	05/16/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	-	-	-	-	-	-	-	-												
F	K1602494	05/02/16	05/16/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	7	-	-												
F	K1602494	05/02/16	05/16/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	-	-												
G	K1602709	05/02/16	05/16/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	-	-												
Total	T/PG			5	10	3	6	3	20	2	4	3	38	5	10	3	21	3	16	3	23	3	23	2	8	3	20	0	0	0	0	0	0	0	0	0	0	0	237

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS/MSD, and DUPs

L:\Kleinfelder\China Lake\36282ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 11, 2016

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C070

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-002	16C070-02	Soil	03/08/16
KCH067-004**	16C070-04**	Soil	03/08/16
KCH067-006	16C070-06	Soil	03/08/16
KCH067-008	16C070-08	Soil	03/08/16
KCH067-010	16C070-10	Soil	03/08/16
KCH067-011	16C070-11	Soil	03/08/16
KCH067-013	16C070-13	Soil	03/08/16
KCH067-014	16C070-14	Soil	03/08/16
KCH067-016**	16C070-16**	Soil	03/08/16
KCH067-018	16C070-18	Soil	03/08/16
KCH067-020	16C070-19	Water	03/08/16
KCH067-016MS	16C070-16MS	Soil	03/08/16
KCH067-016MSD	16C070-16MSD	Soil	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260B

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

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

Average relative response factors (RRF) for all compounds were within validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
02/26/16	tert-Butyl alcohol	0.007 (≤0.01)	All water samples in SDG 16C070	UJ (all non-detects)	A

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
03/14/17	tert-Butyl alcohol	0.007 (≤0.01)	All water samples in SDG 16C070	UJ (all non-detects)	A

V. Laboratory Blanks

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

VI. Field Blanks

Sample KCH067-020 was identified as a trip blank. No contaminants were found.

Sample KCH067-019 (from SDG 16C074) was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
KCH067-019	03/08/16	Carbon disulfide	0.40 ng/L	All soil samples in SDG 16C070

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated field blanks.

VII. Surrogates

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

VIII. Matrix Spike/Matrix Spike Duplicates

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

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

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
KCH067-016MS/MSD (KCH067-016**)	tert-Butyl alcohol	24 (≤20)	NA	-

IX. Laboratory Control Samples

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

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

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

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

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

XIV. System Performance

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

XV. Overall Assessment of Data

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

Due to initial calibration and continuing calibration RRF, data were qualified as estimated in one sample.

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

China Lake CTO 067
Volatiles - Data Qualification Summary - SDG 16C070

Sample	Compound	Flag	A or P	Reason (Code)
KCH067-020	tert-Butyl alcohol	UJ (all non-detects)	A	Initial calibration (RRF) (5)
KCH067-020	tert-Butyl alcohol	UJ (all non-detects)	A	Continuing calibration (RRF) (5)

China Lake CTO 067
Volatiles - Laboratory Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Volatiles - Field Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 12:10
Sample ID	: KCH067-002	Date Analyzed:	03/15/16 12:10
Lab Samp ID	: C070-02	Dilution Factor:	1.01
Lab File ID	: RCB171	Matrix	: SOIL
Ext Btch ID	: VS03C08	% Moisture	: 9.0
Calib. Ref.	: RCB100	Instrument ID	: T-003

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	5.5	0.55	1.1
1,1,1-TRICHLOROETHANE	ND	5.5	0.55	1.1
1,1,2,2-TETRACHLOROETHANE	ND	5.5	0.55	1.1
1,1,2-TRICHLOROETHANE	ND	5.5	0.55	1.1
1,1-DICHLOROETHANE	ND	5.5	0.55	1.1
1,1-DICHLOROETHENE	ND	5.5	0.55	1.1
1,1-DICHLOROPROPENE	ND	5.5	0.55	1.1
1,2,3-TRICHLOROBENZENE	ND	5.5	1.1	2.2
1,2,3-TRICHLOROPROPANE	ND	5.5	1.1	2.2
1,2,4-TRICHLOROBENZENE	ND	5.5	1.1	2.2
1,2,4-TRIMETHYLBENZENE	ND	5.5	0.61	2.2
1,2-DIBROMO-3-CHLOROPROPANE	ND	5.5	1.1	2.2
1,2-DIBROMOETHANE	ND	5.5	0.55	1.1
1,2-DICHLOROBENZENE	ND	5.5	0.55	1.1
1,2-DICHLOROETHANE	ND	5.5	0.55	1.1
1,2-DICHLOROPROPANE	ND	5.5	0.55	1.1
1,3,5-TRIMETHYLBENZENE	ND	5.5	0.65	2.2
1,3-DICHLOROBENZENE	ND	5.5	0.58	1.1
1,3-DICHLOROPROPANE	ND	5.5	0.55	1.1
1,4-DICHLOROBENZENE	ND	5.5	0.55	1.1
2,2-DICHLOROPROPANE	ND	5.5	1.1	2.2
2-BUTANONE	ND	11	2.8	5.5
2-CHLOROTOLUENE	ND	5.5	0.91	2.2
2-HEXANONE	ND	11	3.2	5.5
4-CHLOROTOLUENE	ND	5.5	0.74	2.2
ACETONE	ND	11	3.4	5.5
BENZENE	ND	5.5	0.55	1.1
BROMOBENZENE	ND	5.5	0.55	1.1
BROMOCHLOROMETHANE	ND	5.5	0.55	1.1
BROMODICHLOROMETHANE	ND	5.5	0.55	1.1
BROMOFORM	ND	5.5	1.1	2.2
BROMOMETHANE	ND	11	2.0	2.2
CARBON DISULFIDE	ND	5.5	0.55	1.1
CARBON TETRACHLORIDE	ND	5.5	0.60	1.1
CHLOROBENZENE	ND	5.5	0.55	1.1
CHLOROETHANE	ND	5.5	1.4	2.2
CHLOROFORM	ND	5.5	0.55	1.1
CHLOROMETHANE	ND	5.5	1.1	2.2
CIS-1,2-DICHLOROETHENE	ND	5.5	0.55	1.1
CIS-1,3-DICHLOROPROPENE	ND	5.5	0.55	1.1
DIBROMOCHLOROMETHANE	ND	5.5	0.55	1.1
DIBROMOMETHANE	ND	5.5	0.55	1.1
DICHLORODIFLUOROMETHANE	ND	5.5	1.3	2.2
ETHYLBENZENE	ND	5.5	0.55	1.1
HEXACHLOROBUTADIENE	ND	5.5	1.1	2.2
ISOPROPYLBENZENE	ND	5.5	0.71	2.2
M/P-XYLENES	ND	11	1.1	2.2
4-METHYL-2-PENTANONE	ND	11	3.1	5.5
METHYLENE CHLORIDE	ND	11	2.2	5.5
METHYL TERT-BUTYL ETHER	ND	5.5	0.55	1.1
NAPHTHALENE	ND	11	1.1	2.2
N-BUTYLBENZENE	ND	5.5	0.78	2.2
N-PROPYLBENZENE	ND	5.5	0.72	2.2
O-XYLENE	ND	5.5	0.55	1.1
P-ISOPROPYLTOLUENE	ND	5.5	0.69	2.2
SEC-BUTYLBENZENE	ND	5.5	0.74	2.2
STYRENE	ND	5.5	1.1	2.2
TERT-BUTYLBENZENE	ND	5.5	0.69	2.2
TETRACHLOROETHENE	ND	5.5	0.55	1.1
TOLUENE	ND	5.5	0.55	1.1
TRANS-1,2-DICHLOROETHENE	ND	5.5	0.55	1.1
TRANS-1,3-DICHLOROPROPENE	ND	5.5	0.55	1.1
TRICHLOROETHENE	ND	5.5	0.55	1.1
TRICHLOROFLUOROMETHANE	ND	5.5	1.2	2.2
VINYL CHLORIDE	ND	5.5	1.6	2.2
TERTIARY BUTYL ALCOHOL	ND	22	10	11

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	53.8	55.49	97.0	71-136
4-BROMOFLUOROBENZENE	52.0	55.49	93.8	79-119
TOLUENE-D8	53.3	55.49	96.1	85-116
DIBROMOFLUOROMETHANE	53.9	55.49	97.2	78-119

3/17/16

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 12:38
Sample ID:	KCH067-004	Date Analyzed:	03/15/16 12:38
Lab Samp ID:	C070-04	Dilution Factor:	0.91
Lab File ID:	RCB172	Matrix	: SOIL
Ext Btch ID:	VS03C08	% Moisture	: 4.9
Calib. Ref.:	RCB100	Instrument ID	: T-003

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	4.8	0.48	0.96
1,1,1-TRICHLOROETHANE	ND	4.8	0.48	0.96
1,1,2,2-TETRACHLOROETHANE	ND	4.8	0.48	0.96
1,1,2-TRICHLOROETHANE	ND	4.8	0.48	0.96
1,1-DICHLOROETHANE	ND	4.8	0.48	0.96
1,1-DICHLOROETHENE	ND	4.8	0.48	0.96
1,1-DICHLOROPROPENE	ND	4.8	0.48	0.96
1,2,3-TRICHLOROBENZENE	ND	4.8	0.96	1.9
1,2,3-TRICHLOROPROPANE	ND	4.8	0.96	1.9
1,2,4-TRICHLOROBENZENE	ND	4.8	0.96	1.9
1,2,4-TRIMETHYLBENZENE	ND	4.8	0.53	1.9
1,2-DIBROMO-3-CHLOROPROPANE	ND	4.8	0.96	1.9
1,2-DIBROMOETHANE	ND	4.8	0.48	0.96
1,2-DICHLOROBENZENE	ND	4.8	0.48	0.96
1,2-DICHLOROETHANE	ND	4.8	0.48	0.96
1,2-DICHLOROPROPANE	ND	4.8	0.48	0.96
1,3,5-TRIMETHYLBENZENE	ND	4.8	0.56	1.9
1,3-DICHLOROBENZENE	ND	4.8	0.50	0.96
1,3-DICHLOROPROPANE	ND	4.8	0.48	0.96
1,4-DICHLOROBENZENE	ND	4.8	0.48	0.96
2,2-DICHLOROPROPANE	ND	4.8	0.96	1.9
2-BUTANONE	ND	9.6	2.4	4.8
2-CHLOROTOLUENE	ND	4.8	0.78	1.9
2-HEXANONE	ND	9.6	2.8	4.8
4-CHLOROTOLUENE	ND	4.8	0.64	1.9
ACETONE	ND	9.6	3.0	4.8
BENZENE	ND	4.8	0.48	0.96
BROMOBENZENE	ND	4.8	0.48	0.96
BROMOCHLOROMETHANE	ND	4.8	0.48	0.96
BROMODICHLOROMETHANE	ND	4.8	0.48	0.96
BROMOFORM	ND	4.8	0.96	1.9
BROMOMETHANE	ND	9.6	1.7	1.9
CARBON DISULFIDE	ND	4.8	0.48	0.96
CARBON TETRACHLORIDE	ND	4.8	0.52	0.96
CHLOROBENZENE	ND	4.8	0.48	0.96
CHLOROETHANE	ND	4.8	1.2	1.9
CHLOROFORM	ND	4.8	0.48	0.96
CHLOROMETHANE	ND	4.8	0.96	1.9
CIS-1,2-DICHLOROETHENE	ND	4.8	0.48	0.96
CIS-1,3-DICHLOROPROPENE	ND	4.8	0.48	0.96
DIBROMOCHLOROMETHANE	ND	4.8	0.48	0.96
DIBROMOMETHANE	ND	4.8	0.48	0.96
DICHLORODIFLUOROMETHANE	ND	4.8	1.1	1.9
ETHYLBENZENE	ND	4.8	0.48	0.96
HEXACHLOROBUTADIENE	ND	4.8	0.96	1.9
ISOPROPYLBENZENE	ND	4.8	0.61	1.9
M/P-XYLENES	ND	9.6	0.96	1.9
4-METHYL-2-PENTANONE	ND	9.6	2.7	4.8
METHYLENE CHLORIDE	ND	9.6	1.9	4.8
METHYL TERT-BUTYL ETHER	ND	4.8	0.48	0.96
NAPHTHALENE	ND	9.6	0.96	1.9
N-BUTYLBENZENE	ND	4.8	0.67	1.9
N-PROPYLBENZENE	ND	4.8	0.62	1.9
O-XYLENE	ND	4.8	0.48	0.96
P-ISOPROPYLTOLUENE	ND	4.8	0.59	1.9
SEC-BUTYLBENZENE	ND	4.8	0.64	1.9
STYRENE	ND	4.8	0.96	1.9
TERT-BUTYLBENZENE	ND	4.8	0.59	1.9
TETRACHLOROETHENE	ND	4.8	0.48	0.96
TOLUENE	ND	4.8	0.48	0.96
TRANS-1,2-DICHLOROETHENE	ND	4.8	0.48	0.96
TRANS-1,3-DICHLOROPROPENE	ND	4.8	0.48	0.96
TRICHLOROETHENE	ND	4.8	0.48	0.96
TRICHLOROFLUOROMETHANE	ND	4.8	1.1	1.9
VINYL CHLORIDE	ND	4.8	1.3	1.9
TERTIARY BUTYL ALCOHOL	ND	19	8.8	9.6

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	47.1	47.84	98.4	71-136
4-BROMOFLUOROBENZENE	45.2	47.84	94.4	79-119
TOLUENE-D8	46.1	47.84	96.3	85-116
DIBROMOFLUOROMETHANE	44.7	47.84	93.5	78-119

D5 17/16

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:06
Sample ID:	KCH067-006	Date Analyzed:	03/15/16 13:06
Lab Samp ID:	C070-06	Dilution Factor:	0.92
Lab File ID:	RCB173	Matrix	: SOIL
Ext Btch ID:	VS03C08	% Moisture	: 2.2
Calib. Ref.:	RCB100	Instrument ID	: T-003

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	4.7	0.47	0.94
1,1,1-TRICHLOROETHANE	ND	4.7	0.47	0.94
1,1,2,2-TETRACHLOROETHANE	ND	4.7	0.47	0.94
1,1,2-TRICHLOROETHANE	ND	4.7	0.47	0.94
1,1-DICHLOROETHANE	ND	4.7	0.47	0.94
1,1-DICHLOROETHENE	ND	4.7	0.47	0.94
1,1-DICHLOROPROPENE	ND	4.7	0.47	0.94
1,2,3-TRICHLOROBENZENE	ND	4.7	0.94	1.9
1,2,3-TRICHLOROPROPANE	ND	4.7	0.94	1.9
1,2,4-TRICHLOROBENZENE	ND	4.7	0.94	1.9
1,2,4-TRIMETHYLBENZENE	ND	4.7	0.52	1.9
1,2-DIBROMO-3-CHLOROPROPANE	ND	4.7	0.94	1.9
1,2-DIBROMOETHANE	ND	4.7	0.47	0.94
1,2-DICHLOROBENZENE	ND	4.7	0.47	0.94
1,2-DICHLOROETHANE	ND	4.7	0.47	0.94
1,2-DICHLOROPROPANE	ND	4.7	0.47	0.94
1,3,5-TRIMETHYLBENZENE	ND	4.7	0.56	1.9
1,3-DICHLOROBENZENE	ND	4.7	0.49	0.94
1,3-DICHLOROPROPANE	ND	4.7	0.47	0.94
1,4-DICHLOROBENZENE	ND	4.7	0.47	0.94
2,2-DICHLOROPROPANE	ND	4.7	0.94	1.9
2-BUTANONE	ND	9.4	2.4	4.7
2-CHLOROTOLUENE	ND	4.7	0.77	1.9
2-HEXANONE	ND	9.4	2.7	4.7
4-CHLOROTOLUENE	ND	4.7	0.63	1.9
ACETONE	ND	9.4	2.9	4.7
BENZENE	ND	4.7	0.47	0.94
BROMOBENZENE	ND	4.7	0.47	0.94
BROMOCHLOROMETHANE	ND	4.7	0.47	0.94
BROMODICHLOROMETHANE	ND	4.7	0.47	0.94
BROMOFORM	ND	4.7	0.94	1.9
BROMOMETHANE	ND	9.4	1.7	1.9
CARBON DISULFIDE	ND	4.7	0.47	0.94
CARBON TETRACHLORIDE	ND	4.7	0.51	0.94
CHLOROBENZENE	ND	4.7	0.47	0.94
CHLOROETHANE	ND	4.7	1.2	1.9
CHLOROFORM	ND	4.7	0.47	0.94
CHLOROMETHANE	ND	4.7	0.94	1.9
CIS-1,2-DICHLOROETHENE	ND	4.7	0.47	0.94
CIS-1,3-DICHLOROPROPENE	ND	4.7	0.47	0.94
DIBROMOCHLOROMETHANE	ND	4.7	0.47	0.94
DIBROMOMETHANE	ND	4.7	0.47	0.94
DICHLORODIFLUOROMETHANE	ND	4.7	1.1	1.9
ETHYLBENZENE	ND	4.7	0.47	0.94
HEXACHLOROBUTADIENE	ND	4.7	0.94	1.9
ISOPROPYLBENZENE	ND	4.7	0.60	1.9
M/P-XYLENES	ND	9.4	0.94	1.9
4-METHYL-2-PENTANONE	ND	9.4	2.6	4.7
METHYLENE CHLORIDE	ND	9.4	1.9	4.7
METHYL TERT-BUTYL ETHER	ND	4.7	0.47	0.94
NAPHTHALENE	ND	9.4	0.94	1.9
N-BUTYLBENZENE	ND	4.7	0.66	1.9
N-PROPYLBENZENE	ND	4.7	0.61	1.9
O-XYLENE	ND	4.7	0.47	0.94
P-ISOPROPYLTOLUENE	ND	4.7	0.58	1.9
SEC-BUTYLBENZENE	ND	4.7	0.63	1.9
STYRENE	ND	4.7	0.94	1.9
TERT-BUTYLBENZENE	ND	4.7	0.58	1.9
TETRACHLOROETHENE	ND	4.7	0.47	0.94
TOLUENE	ND	4.7	0.47	0.94
TRANS-1,2-DICHLOROETHENE	ND	4.7	0.47	0.94
TRANS-1,3-DICHLOROPROPENE	ND	4.7	0.47	0.94
TRICHLOROETHENE	ND	4.7	0.47	0.94
TRICHLOROFLUOROMETHANE	ND	4.7	1.0	1.9
VINYL CHLORIDE	ND	4.7	1.3	1.9
TERTIARY BUTYL ALCOHOL	ND	19	8.7	9.4

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	44.1	47.03	93.9	71-136
4-BROMOFLUOROBENZENE	44.7	47.03	95.0	79-119
TOLUENE-D8	44.9	47.03	95.6	85-116
DIBROMOFLUOROMETHANE	44.2	47.03	94.0	78-119

3/25/16

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:34
Sample ID	: KCH067-008	Date Analyzed:	03/15/16 13:34
Lab Samp ID	: C070-08	Dilution Factor:	1.05
Lab File ID	: RCB174	Matrix	: SOIL
Ext Btch ID	: VS03C08	% Moisture	: 1.5
Calib. Ref.	: RCB100	Instrument ID	: T-003

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	5.3	0.53	1.1
1,1,1-TRICHLOROETHANE	ND	5.3	0.53	1.1
1,1,2,2-TETRACHLOROETHANE	ND	5.3	0.53	1.1
1,1,2-TRICHLOROETHANE	ND	5.3	0.53	1.1
1,1-DICHLOROETHANE	ND	5.3	0.53	1.1
1,1-DICHLOROETHENE	ND	5.3	0.53	1.1
1,1-DICHLOROPROPENE	ND	5.3	0.53	1.1
1,2,3-TRICHLOROBENZENE	ND	5.3	1.1	2.1
1,2,3-TRICHLOROPROPANE	ND	5.3	1.1	2.1
1,2,4-TRICHLOROBENZENE	ND	5.3	1.1	2.1
1,2,4-TRIMETHYLBENZENE	ND	5.3	0.59	2.1
1,2-DIBROMO-3-CHLOROPROPANE	ND	5.3	1.1	2.1
1,2-DIBROMOETHANE	ND	5.3	0.53	1.1
1,2-DICHLOROBENZENE	ND	5.3	0.53	1.1
1,2-DICHLOROETHANE	ND	5.3	0.53	1.1
1,2-DICHLOROPROPANE	ND	5.3	0.53	1.1
1,3,5-TRIMETHYLBENZENE	ND	5.3	0.63	2.1
1,3-DICHLOROBENZENE	ND	5.3	0.55	1.1
1,3-DICHLOROPROPANE	ND	5.3	0.53	1.1
1,4-DICHLOROBENZENE	ND	5.3	0.53	1.1
2,2-DICHLOROPROPANE	ND	5.3	1.1	2.1
2-BUTANONE	ND	11	2.7	5.3
2-CHLOROTOLUENE	ND	5.3	0.87	2.1
2-HEXANONE	ND	11	3.1	5.3
4-CHLOROTOLUENE	ND	5.3	0.71	2.1
ACETONE	ND	11	3.3	5.3
BENZENE	ND	5.3	0.53	1.1
BROMOBENZENE	ND	5.3	0.53	1.1
BROMOCHLOROMETHANE	ND	5.3	0.53	1.1
BROMODICHLOROMETHANE	ND	5.3	0.53	1.1
BROMOFORM	ND	5.3	1.1	2.1
BROMOMETHANE	ND	11	1.9	2.1
CARBON DISULFIDE	ND	5.3	0.53	1.1
CARBON TETRACHLORIDE	ND	5.3	0.58	1.1
CHLOROBENZENE	ND	5.3	0.53	1.1
CHLOROETHANE	ND	5.3	1.4	2.1
CHLOROFORM	ND	5.3	0.53	1.1
CHLOROMETHANE	ND	5.3	1.1	2.1
CIS-1,2-DICHLOROETHENE	ND	5.3	0.53	1.1
CIS-1,3-DICHLOROPROPENE	ND	5.3	0.53	1.1
DIBROMOCHLOROMETHANE	ND	5.3	0.53	1.1
DIBROMOMETHANE	ND	5.3	0.53	1.1
DICHLORODIFLUOROMETHANE	ND	5.3	1.3	2.1
ETHYLBENZENE	ND	5.3	0.53	1.1
HEXACHLOROBUTADIENE	ND	5.3	1.1	2.1
ISOPROPYLBENZENE	ND	5.3	0.68	2.1
M/P-XYLENES	ND	11	1.1	2.1
4-METHYL-2-PENTANONE	ND	11	3.0	5.3
METHYLENE CHLORIDE	ND	11	2.1	5.3
METHYL TERT-BUTYL ETHER	ND	5.3	0.53	1.1
NAPHTHALENE	ND	11	1.1	2.1
N-BUTYLBENZENE	ND	5.3	0.75	2.1
N-PROPYLBENZENE	ND	5.3	0.69	2.1
O-XYLENE	ND	5.3	0.53	1.1
P-ISOPROPYLTOLUENE	ND	5.3	0.66	2.1
SEC-BUTYLBENZENE	ND	5.3	0.71	2.1
STYRENE	ND	5.3	1.1	2.1
TERT-BUTYLBENZENE	ND	5.3	0.66	2.1
TETRACHLOROETHENE	ND	5.3	0.53	1.1
TOLUENE	ND	5.3	0.53	1.1
TRANS-1,2-DICHLOROETHENE	ND	5.3	0.53	1.1
TRANS-1,3-DICHLOROPROPENE	ND	5.3	0.53	1.1
TRICHLOROETHENE	ND	5.3	0.53	1.1
TRICHLOROFLUOROMETHANE	ND	5.3	1.2	2.1
VINYL CHLORIDE	ND	5.3	1.5	2.1
TERTIARY BUTYL ALCOHOL	ND	21	9.8	11

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	51.6	53.30	96.9	71-136
4-BROMOFLUOROBENZENE	52.1	53.30	97.7	79-119
TOLUENE-D8	51.7	53.30	97.0	85-116
DIBROMOFLUOROMETHANE	49.3	53.30	92.5	78-119

3/25/16

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 14:02
Sample ID	: KCH067-010	Date Analyzed:	03/15/16 14:02
Lab Samp ID	: C070-10	Dilution Factor:	0.91
Lab File ID	: RCB175	Matrix	: SOIL
Ext Btch ID	: VS03C08	% Moisture	: 3.8
Calib. Ref.	: RCB100	Instrument ID	: T-003

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	4.7	0.47	0.95
1,1,1-TRICHLOROETHANE	ND	4.7	0.47	0.95
1,1,2,2-TETRACHLOROETHANE	ND	4.7	0.47	0.95
1,1,2-TRICHLOROETHANE	ND	4.7	0.47	0.95
1,1-DICHLOROETHANE	ND	4.7	0.47	0.95
1,1-DICHLOROETHENE	ND	4.7	0.47	0.95
1,1-DICHLOROPROPENE	ND	4.7	0.47	0.95
1,2,3-TRICHLOROBENZENE	ND	4.7	0.95	1.9
1,2,3-TRICHLOROPROPANE	ND	4.7	0.95	1.9
1,2,4-TRICHLOROBENZENE	ND	4.7	0.95	1.9
1,2,4-TRIMETHYLBENZENE	ND	4.7	0.52	1.9
1,2-DIBROMO-3-CHLOROPROPANE	ND	4.7	0.95	1.9
1,2-DIBROMOETHANE	ND	4.7	0.47	0.95
1,2-DICHLOROBENZENE	ND	4.7	0.47	0.95
1,2-DICHLOROETHANE	ND	4.7	0.47	0.95
1,2-DICHLOROPROPANE	ND	4.7	0.47	0.95
1,3,5-TRIMETHYLBENZENE	ND	4.7	0.56	1.9
1,3-DICHLOROBENZENE	ND	4.7	0.49	0.95
1,3-DICHLOROPROPANE	ND	4.7	0.47	0.95
1,4-DICHLOROBENZENE	ND	4.7	0.47	0.95
2,2-DICHLOROPROPANE	ND	4.7	0.95	1.9
2-BUTANONE	ND	9.5	2.4	4.7
2-CHLOROTOLUENE	ND	4.7	0.78	1.9
2-HEXANONE	ND	9.5	2.7	4.7
4-CHLOROTOLUENE	ND	4.7	0.63	1.9
ACETONE	ND	9.5	2.9	4.7
BENZENE	ND	4.7	0.47	0.95
BROMOBENZENE	ND	4.7	0.47	0.95
BROMOCHLOROMETHANE	ND	4.7	0.47	0.95
BROMODICHLOROMETHANE	ND	4.7	0.47	0.95
BROMOFORM	ND	4.7	0.95	1.9
BROMOMETHANE	ND	9.5	1.7	1.9
CARBON DISULFIDE	ND	4.7	0.47	0.95
CARBON TETRACHLORIDE	ND	4.7	0.51	0.95
CHLOROBENZENE	ND	4.7	0.47	0.95
CHLOROETHANE	ND	4.7	1.2	1.9
CHLOROFORM	ND	4.7	0.47	0.95
CHLOROMETHANE	ND	4.7	0.95	1.9
CIS-1,2-DICHLOROETHENE	ND	4.7	0.47	0.95
CIS-1,3-DICHLOROPROPENE	ND	4.7	0.47	0.95
DIBROMOCHLOROMETHANE	ND	4.7	0.47	0.95
DIBROMOMETHANE	ND	4.7	0.47	0.95
DICHLORODIFLUOROMETHANE	ND	4.7	1.1	1.9
ETHYLBENZENE	ND	4.7	0.47	0.95
HEXACHLOROBUTADIENE	ND	4.7	0.95	1.9
ISOPROPYLBENZENE	ND	4.7	0.61	1.9
M/P-XYLENES	ND	9.5	0.95	1.9
4-METHYL-2-PENTANONE	ND	9.5	2.6	4.7
METHYLENE CHLORIDE	ND	9.5	1.9	4.7
METHYL TERT-BUTYL ETHER	ND	4.7	0.47	0.95
NAPHTHALENE	ND	9.5	0.95	1.9
N-BUTYLBENZENE	ND	4.7	0.66	1.9
N-PROPYLBENZENE	ND	4.7	0.61	1.9
O-XYLENE	ND	4.7	0.47	0.95
P-ISOPROPYLTOLUENE	ND	4.7	0.59	1.9
SEC-BUTYLBENZENE	ND	4.7	0.63	1.9
STYRENE	ND	4.7	0.95	1.9
TERT-BUTYLBENZENE	ND	4.7	0.59	1.9
TETRACHLOROETHENE	ND	4.7	0.47	0.95
TOLUENE	ND	4.7	0.47	0.95
TRANS-1,2-DICHLOROETHENE	ND	4.7	0.47	0.95
TRANS-1,3-DICHLOROPROPENE	ND	4.7	0.47	0.95
TRICHLOROETHENE	ND	4.7	0.47	0.95
TRICHLOROFLUOROMETHANE	ND	4.7	1.0	1.9
VINYL CHLORIDE	ND	4.7	1.3	1.9
TERTIARY BUTYL ALCOHOL	ND	19	8.7	9.5

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	46.9	47.30	99.1	71-136
4-BROMOFLUOROBENZENE	45.6	47.30	96.3	79-119
TOLUENE-D8	45.2	47.30	95.5	85-116
DIBROMOFLUOROMETHANE	46.4	47.30	98.2	78-119

8051716

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C070	Date Extracted: 03/15/16 14:29
Sample ID: KCH067-011	Date Analyzed: 03/15/16 14:29
Lab Samp ID: C070-11	Dilution Factor: 0.9
Lab File ID: RCB176	Matrix : SOIL
Ext Btch ID: VS03C08	% Moisture : 3.1
Calib. Ref.: RCB100	Instrument ID : T-003

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	4.6	0.46	0.93
1,1,1-TRICHLOROETHANE	ND	4.6	0.46	0.93
1,1,2,2-TETRACHLOROETHANE	ND	4.6	0.46	0.93
1,1,2-TRICHLOROETHANE	ND	4.6	0.46	0.93
1,1-DICHLOROETHANE	ND	4.6	0.46	0.93
1,1-DICHLOROETHENE	ND	4.6	0.46	0.93
1,1-DICHLOROPROPENE	ND	4.6	0.46	0.93
1,2,3-TRICHLOROBENZENE	ND	4.6	0.93	1.9
1,2,3-TRICHLOROPROPANE	ND	4.6	0.93	1.9
1,2,4-TRICHLOROBENZENE	ND	4.6	0.93	1.9
1,2,4-TRIMETHYLBENZENE	0.68J	4.6	0.51	1.9
1,2-DIBROMO-3-CHLOROPROPANE	ND	4.6	0.93	1.9
1,2-DIBROMOETHANE	ND	4.6	0.46	0.93
1,2-DICHLOROBENZENE	ND	4.6	0.46	0.93
1,2-DICHLOROETHANE	ND	4.6	0.46	0.93
1,2-DICHLOROPROPANE	ND	4.6	0.46	0.93
1,3,5-TRIMETHYLBENZENE	ND	4.6	0.55	1.9
1,3-DICHLOROBENZENE	ND	4.6	0.48	0.93
1,3-DICHLOROPROPANE	ND	4.6	0.46	0.93
1,4-DICHLOROBENZENE	ND	4.6	0.46	0.93
2,2-DICHLOROPROPANE	ND	4.6	0.93	1.9
2-BUTANONE	ND	9.3	2.3	4.6
2-CHLOROTOLUENE	ND	4.6	0.76	1.9
2-HEXANONE	ND	9.3	2.7	4.6
4-CHLOROTOLUENE	ND	4.6	0.62	1.9
ACETONE	5.0J	9.3	2.9	4.6
BENZENE	ND	4.6	0.46	0.93
BROMOBENZENE	ND	4.6	0.46	0.93
BROMOCHLOROMETHANE	ND	4.6	0.46	0.93
BROMODICHLOROMETHANE	ND	4.6	0.46	0.93
BROMOFORM	ND	4.6	0.93	1.9
BROMOMETHANE	ND	9.3	1.7	1.9
CARBON DISULFIDE	ND	4.6	0.46	0.93
CARBON TETRACHLORIDE	ND	4.6	0.50	0.93
CHLOROBENZENE	ND	4.6	0.46	0.93
CHLOROETHANE	ND	4.6	1.2	1.9
CHLOROFORM	ND	4.6	0.46	0.93
CHLOROMETHANE	ND	4.6	0.93	1.9
CIS-1,2-DICHLOROETHENE	ND	4.6	0.46	0.93
CIS-1,3-DICHLOROPROPENE	ND	4.6	0.46	0.93
DIBROMOCHLOROMETHANE	ND	4.6	0.46	0.93
DIBROMOMETHANE	ND	4.6	0.46	0.93
DICHLORODIFLUOROMETHANE	ND	4.6	1.1	1.9
ETHYLBENZENE	ND	4.6	0.46	0.93
HEXACHLOROBUTADIENE	ND	4.6	0.93	1.9
ISOPROPYLBENZENE	ND	4.6	0.59	1.9
M/P-XYLENES	ND	9.3	0.93	1.9
4-METHYL-2-PENTANONE	ND	9.3	2.6	4.6
METHYLENE CHLORIDE	ND	9.3	1.9	4.6
METHYL TERT-BUTYL ETHER	ND	4.6	0.46	0.93
NAPHTHALENE	2.6J	9.3	0.93	1.9
N-BUTYLBENZENE	ND	4.6	0.65	1.9
N-PROPYLBENZENE	ND	4.6	0.60	1.9
O-XYLENE	ND	4.6	0.46	0.93
P-ISOPROPYLTOLUENE	ND	4.6	0.58	1.9
SEC-BUTYLBENZENE	ND	4.6	0.62	1.9
STYRENE	ND	4.6	0.93	1.9
TERT-BUTYLBENZENE	ND	4.6	0.58	1.9
TETRACHLOROETHENE	ND	4.6	0.46	0.93
TOLUENE	0.48J	4.6	0.46	0.93
TRANS-1,2-DICHLOROETHENE	ND	4.6	0.46	0.93
TRANS-1,3-DICHLOROPROPENE	ND	4.6	0.46	0.93
TRICHLOROETHENE	ND	4.6	0.46	0.93
TRICHLOROFLUOROMETHANE	ND	4.6	1.0	1.9
VINYL CHLORIDE	ND	4.6	1.3	1.9
TERTIARY BUTYL ALCOHOL	ND	19	8.5	9.3

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	47.5	46.44	102	71-136
4-BROMOFLUOROBENZENE	51.2	46.44	110	79-119
TOLUENE-D8	48.7	46.44	105	85-116
DIBROMOFLUOROMETHANE	46.7	46.44	101	78-119

8/25/16

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 17:03
Sample ID	: KCH067-013	Date Analyzed:	03/15/16 17:03
Lab Samp ID	: C070-13	Dilution Factor:	0.82
Lab File ID	: RCB181	Matrix	: SOIL
Ext Btch ID	: VS03C08	% Moisture	: 5.0
Calib. Ref.	: RCB100	Instrument ID	: T-003

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	4.3	0.43	0.86
1,1,1-TRICHLOROETHANE	ND	4.3	0.43	0.86
1,1,2,2-TETRACHLOROETHANE	ND	4.3	0.43	0.86
1,1,2-TRICHLOROETHANE	ND	4.3	0.43	0.86
1,1-DICHLOROETHANE	ND	4.3	0.43	0.86
1,1-DICHLOROETHENE	ND	4.3	0.43	0.86
1,1-DICHLOROPROPENE	ND	4.3	0.43	0.86
1,2,3-TRICHLOROBENZENE	ND	4.3	0.86	1.7
1,2,3-TRICHLOROPROPANE	ND	4.3	0.86	1.7
1,2,4-TRICHLOROBENZENE	ND	4.3	0.86	1.7
1,2,4-TRIMETHYLBENZENE	ND	4.3	0.47	1.7
1,2-DIBROMO-3-CHLOROPROPANE	ND	4.3	0.86	1.7
1,2-DIBROMOETHANE	ND	4.3	0.43	0.86
1,2-DICHLOROBENZENE	ND	4.3	0.43	0.86
1,2-DICHLOROETHANE	ND	4.3	0.43	0.86
1,2-DICHLOROPROPANE	ND	4.3	0.43	0.86
1,3,5-TRIMETHYLBENZENE	ND	4.3	0.51	1.7
1,3-DICHLOROBENZENE	ND	4.3	0.45	0.86
1,3-DICHLOROPROPANE	ND	4.3	0.43	0.86
1,4-DICHLOROBENZENE	ND	4.3	0.43	0.86
2,2-DICHLOROPROPANE	ND	4.3	0.86	1.7
2-BUTANONE	ND	8.6	2.2	4.3
2-CHLOROTOLUENE	ND	4.3	0.71	1.7
2-HEXANONE	ND	8.6	2.5	4.3
4-CHLOROTOLUENE	ND	4.3	0.58	1.7
ACETONE	ND	8.6	2.7	4.3
BENZENE	ND	4.3	0.43	0.86
BROMOBENZENE	ND	4.3	0.43	0.86
BROMOCHLOROMETHANE	ND	4.3	0.43	0.86
BROMODICHLOROMETHANE	ND	4.3	0.43	0.86
BROMOFORM	ND	4.3	0.86	1.7
BROMOMETHANE	ND	8.6	1.6	1.7
CARBON DISULFIDE	ND	4.3	0.43	0.86
CARBON TETRACHLORIDE	ND	4.3	0.47	0.86
CHLOROBENZENE	ND	4.3	0.43	0.86
CHLOROETHANE	ND	4.3	1.1	1.7
CHLOROFORM	ND	4.3	0.43	0.86
CHLOROMETHANE	ND	4.3	0.86	1.7
CIS-1,2-DICHLOROETHENE	ND	4.3	0.43	0.86
CIS-1,3-DICHLOROPROPENE	ND	4.3	0.43	0.86
DIBROMOCHLOROMETHANE	ND	4.3	0.43	0.86
DIBROMOMETHANE	ND	4.3	0.43	0.86
DICHLORODIFLUOROMETHANE	ND	4.3	1.0	1.7
ETHYLBENZENE	ND	4.3	0.43	0.86
HEXACHLOROBUTADIENE	ND	4.3	0.86	1.7
ISOPROPYLBENZENE	ND	4.3	0.55	1.7
M/P-XYLENES	ND	8.6	0.86	1.7
4-METHYL-2-PENTANONE	ND	8.6	2.4	4.3
METHYLENE CHLORIDE	ND	8.6	1.7	4.3
METHYL TERT-BUTYL ETHER	ND	4.3	0.43	0.86
NAPHTHALENE	ND	8.6	0.86	1.7
N-BUTYLBENZENE	ND	4.3	0.60	1.7
N-PROPYLBENZENE	ND	4.3	0.56	1.7
O-XYLENE	ND	4.3	0.43	0.86
P-ISOPROPYLTOLUENE	ND	4.3	0.54	1.7
SEC-BUTYLBENZENE	ND	4.3	0.58	1.7
STYRENE	ND	4.3	0.86	1.7
TERT-BUTYLBENZENE	ND	4.3	0.54	1.7
TETRACHLOROETHENE	ND	4.3	0.43	0.86
TOLUENE	ND	4.3	0.43	0.86
TRANS-1,2-DICHLOROETHENE	ND	4.3	0.43	0.86
TRANS-1,3-DICHLOROPROPENE	ND	4.3	0.43	0.86
TRICHLOROETHENE	ND	4.3	0.43	0.86
TRICHLOROFLUOROMETHANE	ND	4.3	0.95	1.7
VINYL CHLORIDE	ND	4.3	1.2	1.7
TERTIARY BUTYL ALCOHOL	ND	17	7.9	8.6

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	44.7	43.16	104	71-136
4-BROMOFLUOROBENZENE	39.7	43.16	92.0	79-119
TOLUENE-D8	40.4	43.16	93.6	85-116
DIBROMOFLUOROMETHANE	45.3	43.16	105	78-119

3/15/16

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 17:32
Sample ID	: KCH067-014	Date Analyzed:	03/15/16 17:32
Lab Samp ID	: C070-14	Dilution Factor:	0.87
Lab File ID	: RCB182	Matrix	: SOIL
Ext Btch ID	: VS03C08	% Moisture	: 3.9
Calib. Ref.	: RCB100	Instrument ID	: T-003

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	4.5	0.45	0.91
1,1,1-TRICHLOROETHANE	ND	4.5	0.45	0.91
1,1,2,2-TETRACHLOROETHANE	ND	4.5	0.45	0.91
1,1,2-TRICHLOROETHANE	ND	4.5	0.45	0.91
1,1-DICHLOROETHANE	ND	4.5	0.45	0.91
1,1-DICHLOROETHENE	ND	4.5	0.45	0.91
1,1-DICHLOROPROPENE	ND	4.5	0.45	0.91
1,2,3-TRICHLOROBENZENE	ND	4.5	0.91	1.8
1,2,3-TRICHLOROPROPANE	ND	4.5	0.91	1.8
1,2,4-TRICHLOROBENZENE	ND	4.5	0.91	1.8
1,2,4-TRIMETHYLBENZENE	ND	4.5	0.50	1.8
1,2-DIBROMO-3-CHLOROPROPANE	ND	4.5	0.91	1.8
1,2-DIBROMOETHANE	ND	4.5	0.45	0.91
1,2-DICHLOROBENZENE	ND	4.5	0.45	0.91
1,2-DICHLOROETHANE	ND	4.5	0.45	0.91
1,2-DICHLOROPROPANE	ND	4.5	0.45	0.91
1,3,5-TRIMETHYLBENZENE	ND	4.5	0.53	1.8
1,3-DICHLOROBENZENE	ND	4.5	0.47	0.91
1,3-DICHLOROPROPANE	ND	4.5	0.45	0.91
1,4-DICHLOROBENZENE	ND	4.5	0.45	0.91
2,2-DICHLOROPROPANE	ND	4.5	0.91	1.8
2-BUTANONE	ND	9.1	2.3	4.5
2-CHLOROTOLUENE	ND	4.5	0.74	1.8
2-HEXANONE	ND	9.1	2.6	4.5
4-CHLOROTOLUENE	ND	4.5	0.61	1.8
ACETONE	ND	9.1	2.8	4.5
BENZENE	ND	4.5	0.45	0.91
BROMOBENZENE	ND	4.5	0.45	0.91
BROMOCHLOROMETHANE	ND	4.5	0.45	0.91
BROMODICHLOROMETHANE	ND	4.5	0.45	0.91
BROMOFORM	ND	4.5	0.91	1.8
BROMOMETHANE	ND	9.1	1.6	1.8
CARBON DISULFIDE	ND	4.5	0.45	0.91
CARBON TETRACHLORIDE	ND	4.5	0.49	0.91
CHLOROBENZENE	ND	4.5	0.45	0.91
CHLOROETHANE	ND	4.5	1.2	1.8
CHLOROFORM	ND	4.5	0.45	0.91
CHLOROMETHANE	ND	4.5	0.91	1.8
CIS-1,2-DICHLOROETHENE	ND	4.5	0.45	0.91
CIS-1,3-DICHLOROPROPENE	ND	4.5	0.45	0.91
DIBROMOCHLOROMETHANE	ND	4.5	0.45	0.91
DIBROMOMETHANE	ND	4.5	0.45	0.91
DICHLORODIFLUOROMETHANE	ND	4.5	1.1	1.8
ETHYLBENZENE	ND	4.5	0.45	0.91
HEXACHLOROBUTADIENE	ND	4.5	0.91	1.8
ISOPROPYLBENZENE	ND	4.5	0.58	1.8
M/P-XYLENES	ND	9.1	0.91	1.8
4-METHYL-2-PENTANONE	ND	9.1	2.5	4.5
METHYLENE CHLORIDE	ND	9.1	1.8	4.5
METHYL TERT-BUTYL ETHER	ND	4.5	0.45	0.91
NAPHTHALENE	ND	9.1	0.91	1.8
N-BUTYLBENZENE	ND	4.5	0.63	1.8
N-PROPYLBENZENE	ND	4.5	0.59	1.8
O-XYLENE	ND	4.5	0.45	0.91
P-ISOPROPYLTOLUENE	ND	4.5	0.56	1.8
SEC-BUTYLBENZENE	ND	4.5	0.61	1.8
STYRENE	ND	4.5	0.91	1.8
TERT-BUTYLBENZENE	ND	4.5	0.56	1.8
TETRACHLOROETHENE	ND	4.5	0.45	0.91
TOLUENE	ND	4.5	0.45	0.91
TRANS-1,2-DICHLOROETHENE	ND	4.5	0.45	0.91
TRANS-1,3-DICHLOROPROPENE	ND	4.5	0.45	0.91
TRICHLOROETHENE	ND	4.5	0.45	0.91
TRICHLOROFLUOROMETHANE	ND	4.5	1.0	1.8
VINYL CHLORIDE	ND	4.5	1.3	1.8
TERTIARY BUTYL ALCOHOL	ND	18	8.3	9.1

SURROGATE PARAMETERS	RESULTS	SPK AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	46.5	45.27	103	71-136
4-BROMOFLUOROBENZENE	40.1	45.27	88.5	79-119
TOLUENE-D8	43.0	45.27	95.1	85-116
DIBROMOFLUOROMETHANE	47.2	45.27	104	78-119

SK 3/17/16

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:36
Sample ID:	KCH067-016	Date Analyzed:	03/15/16 16:36
Lab Samp ID:	C070-16	Dilution Factor:	0.95
Lab File ID:	RCB180	Matrix	: SOIL
Ext Btch ID:	VS03C08	% Moisture	: 2.8
Calib. Ref.:	RCB100	Instrument ID	: T-003

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	4.9	0.49	0.98
1,1,1-TRICHLOROETHANE	ND	4.9	0.49	0.98
1,1,2,2-TETRACHLOROETHANE	ND	4.9	0.49	0.98
1,1,2-TRICHLOROETHANE	ND	4.9	0.49	0.98
1,1-DICHLOROETHANE	ND	4.9	0.49	0.98
1,1-DICHLOROETHENE	ND	4.9	0.49	0.98
1,1-DICHLOROPROPENE	ND	4.9	0.49	0.98
1,2,3-TRICHLOROBENZENE	ND	4.9	0.98	2.0
1,2,3-TRICHLOROPROPANE	ND	4.9	0.98	2.0
1,2,4-TRICHLOROBENZENE	ND	4.9	0.98	2.0
1,2,4-TRIMETHYLBENZENE	ND	4.9	0.54	2.0
1,2-DIBROMO-3-CHLOROPROPANE	ND	4.9	0.98	2.0
1,2-DIBROMOETHANE	ND	4.9	0.49	0.98
1,2-DICHLOROBENZENE	ND	4.9	0.49	0.98
1,2-DICHLOROETHANE	ND	4.9	0.49	0.98
1,2-DICHLOROPROPANE	ND	4.9	0.49	0.98
1,3,5-TRIMETHYLBENZENE	ND	4.9	0.58	2.0
1,3-DICHLOROBENZENE	ND	4.9	0.51	0.98
1,3-DICHLOROPROPANE	ND	4.9	0.49	0.98
1,4-DICHLOROBENZENE	ND	4.9	0.49	0.98
2,2-DICHLOROPROPANE	ND	4.9	0.98	2.0
2-BUTANONE	ND	9.8	2.4	4.9
2-CHLOROTOLUENE	ND	4.9	0.80	2.0
2-HEXANONE	ND	9.8	2.8	4.9
4-CHLOROTOLUENE	ND	4.9	0.65	2.0
ACETONE	ND	9.8	3.0	4.9
BENZENE	ND	4.9	0.49	0.98
BROMOBENZENE	ND	4.9	0.49	0.98
BROMOCHLOROMETHANE	ND	4.9	0.49	0.98
BROMODICHLOROMETHANE	ND	4.9	0.49	0.98
BROMOFORM	ND	4.9	0.98	2.0
BROMOMETHANE	ND	9.8	1.8	2.0
CARBON DISULFIDE	ND	4.9	0.49	0.98
CARBON TETRACHLORIDE	ND	4.9	0.53	0.98
CHLOROBENZENE	ND	4.9	0.49	0.98
CHLOROETHANE	ND	4.9	1.3	2.0
CHLOROFORM	ND	4.9	0.49	0.98
CHLOROMETHANE	ND	4.9	0.98	2.0
CIS-1,2-DICHLOROETHENE	ND	4.9	0.49	0.98
CIS-1,3-DICHLOROPROPENE	ND	4.9	0.49	0.98
DIBROMOCHLOROMETHANE	ND	4.9	0.49	0.98
DIBROMOMETHANE	ND	4.9	0.49	0.98
DICHLORODIFLUOROMETHANE	ND	4.9	1.2	2.0
ETHYLBENZENE	ND	4.9	0.49	0.98
HEXACHLOROBUTADIENE	ND	4.9	0.98	2.0
ISOPROPYLBENZENE	ND	4.9	0.63	2.0
M/P-XYLENES	ND	9.8	0.98	2.0
4-METHYL-2-PENTANONE	ND	9.8	2.7	4.9
METHYLENE CHLORIDE	ND	9.8	2.0	4.9
METHYL TERT-BUTYL ETHER	ND	4.9	0.49	0.98
NAPHTHALENE	ND	9.8	0.98	2.0
N-BUTYLBENZENE	ND	4.9	0.68	2.0
N-PROPYLBENZENE	ND	4.9	0.64	2.0
O-XYLENE	ND	4.9	0.49	0.98
P-ISOPROPYLTOLUENE	ND	4.9	0.61	2.0
SEC-BUTYLBENZENE	ND	4.9	0.65	2.0
STYRENE	ND	4.9	0.98	2.0
TERT-BUTYLBENZENE	ND	4.9	0.61	2.0
TETRACHLOROETHENE	ND	4.9	0.49	0.98
TOLUENE	ND	4.9	0.49	0.98
TRANS-1,2-DICHLOROETHENE	ND	4.9	0.49	0.98
TRANS-1,3-DICHLOROPROPENE	ND	4.9	0.49	0.98
TRICHLOROETHENE	ND	4.9	0.49	0.98
TRICHLOROFLUOROMETHANE	ND	4.9	1.1	2.0
VINYL CHLORIDE	ND	4.9	1.4	2.0
TERTIARY BUTYL ALCOHOL	ND	20	9.0	9.8

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	48.8	48.87	99.8	71-136
4-BROMOFLUOROBENZENE	45.0	48.87	92.2	79-119
TOLUENE-D8	46.0	48.87	94.2	85-116
DIBROMOFLUOROMETHANE	48.7	48.87	99.7	78-119

3/25/16

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 18:00
Sample ID:	KCH067-018	Date Analyzed:	03/15/16 18:00
Lab Samp ID:	C070-18	Dilution Factor:	0.87
Lab File ID:	RCB183	Matrix	: SOIL
Ext Btch ID:	VS03C08	% Moisture	: 2.1
Calib. Ref.:	RCB100	Instrument ID	: T-003

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	4.4	0.44	0.89
1,1,1-TRICHLOROETHANE	ND	4.4	0.44	0.89
1,1,2,2-TETRACHLOROETHANE	ND	4.4	0.44	0.89
1,1,2-TRICHLOROETHANE	ND	4.4	0.44	0.89
1,1-DICHLOROETHANE	ND	4.4	0.44	0.89
1,1-DICHLOROETHENE	ND	4.4	0.44	0.89
1,1-DICHLOROPROPENE	ND	4.4	0.44	0.89
1,2,3-TRICHLOROBENZENE	ND	4.4	0.89	1.8
1,2,3-TRICHLOROPROPANE	ND	4.4	0.89	1.8
1,2,4-TRICHLOROBENZENE	ND	4.4	0.89	1.8
1,2,4-TRIMETHYLBENZENE	ND	4.4	0.49	1.8
1,2-DIBROMO-3-CHLOROPROPANE	ND	4.4	0.89	1.8
1,2-DIBROMOETHANE	ND	4.4	0.44	0.89
1,2-DICHLOROBENZENE	ND	4.4	0.44	0.89
1,2-DICHLOROETHANE	ND	4.4	0.44	0.89
1,2-DICHLOROPROPANE	ND	4.4	0.44	0.89
1,3,5-TRIMETHYLBENZENE	ND	4.4	0.52	1.8
1,3-DICHLOROBENZENE	ND	4.4	0.46	0.89
1,3-DICHLOROPROPANE	ND	4.4	0.44	0.89
1,4-DICHLOROBENZENE	ND	4.4	0.44	0.89
2,2-DICHLOROPROPANE	ND	4.4	0.89	1.8
2-BUTANONE	ND	8.9	2.2	4.4
2-CHLOROTOLUENE	ND	4.4	0.73	1.8
2-HEXANONE	ND	8.9	2.6	4.4
4-CHLOROTOLUENE	ND	4.4	0.60	1.8
ACETONE	ND	8.9	2.8	4.4
BENZENE	ND	4.4	0.44	0.89
BROMOBENZENE	ND	4.4	0.44	0.89
BROMOCHLOROMETHANE	ND	4.4	0.44	0.89
BROMODICHLOROMETHANE	ND	4.4	0.44	0.89
BROMOFORM	ND	4.4	0.89	1.8
BROMOMETHANE	ND	8.9	1.6	1.8
CARBON DISULFIDE	ND	4.4	0.44	0.89
CARBON TETRACHLORIDE	ND	4.4	0.48	0.89
CHLOROBENZENE	ND	4.4	0.44	0.89
CHLOROETHANE	ND	4.4	1.2	1.8
CHLOROFORM	ND	4.4	0.44	0.89
CHLOROMETHANE	ND	4.4	0.89	1.8
CIS-1,2-DICHLOROETHENE	ND	4.4	0.44	0.89
CIS-1,3-DICHLOROPROPENE	ND	4.4	0.44	0.89
DIBROMOCHLOROMETHANE	ND	4.4	0.44	0.89
DIBROMOMETHANE	ND	4.4	0.44	0.89
DICHLORODIFLUOROMETHANE	ND	4.4	1.1	1.8
ETHYLBENZENE	ND	4.4	0.44	0.89
HEXACHLOROBUTADIENE	ND	4.4	0.89	1.8
ISOPROPYLBENZENE	ND	4.4	0.57	1.8
M/P-XYLENES	ND	8.9	0.89	1.8
4-METHYL-2-PENTANONE	ND	8.9	2.5	4.4
METHYLENE CHLORIDE	ND	8.9	1.8	4.4
METHYL TERT-BUTYL ETHER	ND	4.4	0.44	0.89
NAPHTHALENE	ND	8.9	0.89	1.8
N-BUTYLBENZENE	ND	4.4	0.62	1.8
N-PROPYLBENZENE	ND	4.4	0.58	1.8
O-XYLENE	ND	4.4	0.44	0.89
P-ISOPROPYLTOLUENE	ND	4.4	0.55	1.8
SEC-BUTYLBENZENE	ND	4.4	0.60	1.8
STYRENE	ND	4.4	0.89	1.8
TERT-BUTYLBENZENE	ND	4.4	0.55	1.8
TETRACHLOROETHENE	ND	4.4	0.44	0.89
TOLUENE	ND	4.4	0.44	0.89
TRANS-1,2-DICHLOROETHENE	ND	4.4	0.44	0.89
TRANS-1,3-DICHLOROPROPENE	ND	4.4	0.44	0.89
TRICHLOROETHENE	ND	4.4	0.44	0.89
TRICHLOROFLUOROMETHANE	ND	4.4	0.98	1.8
VINYL CHLORIDE	ND	4.4	1.2	1.8
TERTIARY BUTYL ALCOHOL	ND	18	8.2	8.9

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	46.0	44.43	104	71-136
4-BROMOFLUOROBENZENE	40.6	44.43	91.3	79-119
TOLUENE-D8	42.3	44.43	95.1	85-116
DIBROMOFLUOROMETHANE	46.6	44.43	105	78-119

3/17/16

METHOD SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/14/16 13:59
Sample ID	: KCH067-020	Date Analyzed:	03/14/16 13:59
Lab Samp ID	: C070-19	Dilution Factor:	1
Lab File ID	: RCC265	Matrix	: WATER
Ext Btch ID	: VO67C11	% Moisture	: NA
Calib. Ref.	: RBC337	Instrument ID	: 67

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.10	0.20
1,1,1-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.11	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHENE	ND	1.0	0.10	0.20
1,1-DICHLOROPROPENE	ND	1.0	0.10	0.20
1,2,3-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,3-TRICHLOROPROPANE	ND	2.0	0.25	0.50
1,2,4-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,4-TRIMETHYLBENZENE	ND	1.0	0.11	0.20
1,2-DIBROMO-3-CHLOROPROPANE	ND	2.0	0.25	0.50
1,2-DIBROMOETHANE	ND	1.0	0.10	0.20
1,2-DICHLOROBENZENE	ND	1.0	0.10	0.20
1,2-DICHLOROETHANE	ND	1.0	0.10	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.10	0.20
1,3,5-TRIMETHYLBENZENE	ND	1.0	0.13	0.20
1,3-DICHLOROBENZENE	ND	1.0	0.11	0.20
1,3-DICHLOROPROPANE	ND	1.0	0.10	0.20
1,4-DICHLOROBENZENE	ND	1.0	0.10	0.20
2,2-DICHLOROPROPANE	ND	1.0	0.16	0.30
2-BUTANONE	ND	10	2.0	5.0
2-CHLOROTOLUENE	ND	1.0	0.12	0.20
2-HEXANONE	ND	10	2.3	5.0
4-CHLOROTOLUENE	ND	1.0	0.11	0.20
ACETONE	ND	10	2.6	5.0
BENZENE	ND	1.0	0.10	0.20
BROMOBENZENE	ND	1.0	0.10	0.20
BROMOCHLOROMETHANE	ND	1.0	0.11	0.20
BROMODICHLOROMETHANE	ND	1.0	0.10	0.20
BROMOFORM	ND	1.0	0.15	0.30
BROMOMETHANE	ND	1.0	0.16	0.30
CARBON DISULFIDE	ND	1.0	0.25	0.50
CARBON TETRACHLORIDE	ND	1.0	0.10	0.20
CHLOROBENZENE	ND	1.0	0.10	0.20
CHLOROETHANE	ND	1.0	0.27	0.30
CHLOROFORM	ND	1.0	0.10	0.20
CHLOROMETHANE	ND	1.0	0.15	0.30
CIS-1,2-DICHLOROETHENE	ND	1.0	0.10	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.10	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.10	0.20
DIBROMOMETHANE	ND	1.0	0.10	0.20
DICHLORODIFLUOROMETHANE	ND	1.0	0.15	0.30
ETHYLBENZENE	ND	1.0	0.10	0.20
HEXACHLOROBUTADIENE	ND	1.0	0.22	0.30
ISOPROPYLBENZENE	ND	1.0	0.10	0.20
M/P-XYLENES	ND	2.0	0.21	0.40
4-METHYL-2-PENTANONE	ND	10	2.1	5.0
METHYLENE CHLORIDE	ND	2.0	0.50	1.0
METHYL TERT-BUTYL ETHER	ND	1.0	0.13	0.20
NAPHTHALENE	ND	2.0	0.50	1.0
N-BUTYLBENZENE	ND	1.0	0.17	0.30
N-PROPYLBENZENE	ND	1.0	0.13	0.20
O-XYLENE	ND	1.0	0.10	0.20
P-ISOPROPYLTOLUENE	ND	1.0	0.14	0.20
SEC-BUTYLBENZENE	ND	1.0	0.13	0.20
STYRENE	ND	1.0	0.25	0.50
TERT-BUTYLBENZENE	ND	1.0	0.13	0.20
TETRACHLOROETHENE	ND	1.0	0.15	0.20
TOLUENE	ND	1.0	0.10	0.20
TRANS-1,2-DICHLOROETHENE	ND	1.0	0.10	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.11	0.20
TRICHLOROETHENE	ND	1.0	0.10	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.15	0.30
VINYL CHLORIDE	ND	1.0	0.12	0.20
TERTIARY BUTYL ALCOHOL	ND UJ(5)	10	2.5	5.0

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	9.68	10.00	96.8	81-118
4-BROMOFLUOROBENZENE	9.97	10.00	99.7	85-114
TOLUENE-D8	10.0	10.00	100	89-112
DIBROMOFLUOROMETHANE	9.97	10.00	99.7	80-119

SLC 3/17/16

LDC #: 36282A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C070 Standard/Full Page: 1 of 2
Laboratory: EMAX Laboratories Inc. Reviewer: EM
2nd Reviewer: M

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / D	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW/A	% RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration / ending CCV	SW	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	EB = KCH067-019 (SDG# 16C074) *TB= 11
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	A	was IR
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Standard validation.
XIII.	Target compound identification	A	Not reviewed for Standard validation.
XIV.	System performance	A	Not reviewed for Standard validation.
XV.	Overall assessment of data	A	

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

** Indicates sample underwent Full validation

	Client ID	Lab ID	Matrix	Date
1	KCH067-002	16C070-02	Soil	03/08/16
2	KCH067-004**	16C070-04**	Soil	03/08/16
3	KCH067-006	16C070-06	Soil	03/08/16
4	KCH067-008	16C070-08	Soil	03/08/16
5	KCH067-010	16C070-10	Soil	03/08/16
6	KCH067-011	16C070-11	Soil	03/08/16
7	KCH067-013	16C070-13	Soil	03/08/16
8	KCH067-014	16C070-14	Soil	03/08/16
9	KCH067-016**	16C070-16**	Soil	03/08/16
10	KCH067-018	16C070-18	Soil	03/08/16
11	KCH067-020 TB	16C070-19	Water	03/08/16
12	KCH067-016MS	16C070-16MS	Soil	03/08/16
13	KCH067-016MSD	16C070-16MSD	Soil	03/08/16

LDC #: 36282A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C070 Standard/Full Page: 2 of 2
Laboratory: EMAX Laboratories Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				
17				
18				

Notes:

	MBLK1W						
	MBLK1S						
	MBLK2S						
	MBLK3S						

LDC #: 36282A 1

VALIDATION FINDINGS CHECKLIST

Reviewer: FB
2nd Reviewer: DC

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were all percent relative standard deviations (%RSD) ≤ ~~30%~~/15% and relative response factors (RRF) ≥ 0.05?	1	✓		
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?		✓		
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	

LDC #: 36282A1

VALIDATION FINDINGS CHECKLIST

Reviewer: F
2nd Reviewer: FC

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 36282A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: FT
2nd Reviewer: SC

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

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

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15 %RSD and ≥0.05 RRF ?

code = 5

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30/15%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	2/26/16	VB67B26-ICAL	ZZZ		0.007 (20.01)	all water	J+/UJ/A (ND)

LDC #: 36282A /

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer: DC

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

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

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

work = 5

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	3/14/17	RCC 257-ccv	ZZZ		0.007 (I 0.01)	All water	J/UJ/A (ND)

LDC #: 36282A1

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT
2nd Reviewer: SK

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

(Y) N N/A Were field blanks identified in this SDG? EB = KCH067-019 (SDG # 160074)
Y N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/Kg
Sampling date: 3/8/16
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: EB Associated Samples: All soils (ND)

Compound	Blank ID	Sample Identification								
	EB									
G	0.40									

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC #: 36282A1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: FT
2nd Reviewer: [illegible]

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

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

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

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

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

code = 9

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	12 + 13	ZZZ	( )	( )	24 (20)	9	J det / A (ND)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 36282A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50 std)	Recalculated RRF (50 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	V003C1D	3/10/16	C (1st internal standard)	0.389	0.389	0.358	0.358	13.88	13.88
			CC (2nd internal standard)	1.608	1.608	1.683	1.683	6.90	6.90
			BB (3rd internal standard)	1.311	1.311	1.409	1.409	4.62	4.62
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

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

LDC #: 36282A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: AC

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

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

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

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

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	RCB162	3/15/16	C (IS1)	0.358	0.325	0.325	9.2	9.2
			CC (IS2)	1.683	1.701	1.701	1.1	1.1
			BB (IS3)	1.409	1.408	1.408	0.1	0.1
			(IS4)					
			(IS5)					
2			(IS1)					
			(IS2)					
			(IS3)					
			(IS4)					
			(IS5)					
3								
4								

LDC #: 36282A)

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer: [signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #9

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane	50.0	49.86	99.7	99.7	0
1,2-Dichloroethane-d4	↓	49.89	99.8	99.8	↓
Toluene-d8	↓	47.11	94.2	94.2	↓
Bromofluorobenzene	↓	46.08	92.2	92.2	↓

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 36282A1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 8260B)

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

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

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

MS/MSD sample: 12 + 13

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	45.8	46.3	ND	48.7	45.1	106	106	97	97	9	9
Trichloroethene	↓	↓	↓	49.5	46.3	108	108	100	100	8	8
Benzene	↓	↓	↓	~~45.8~~ F1 46.1	~~46.3~~ F1 43.4	101	101	94	94	7	7
Toluene	↓	↓	↓	48.0	45.6	105	105	99	99	6	6
Chlorobenzene	↓	↓	↓	47.8	46.2	104	104	100	100	4	4

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

LDC #: 36282A1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 8260B)

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

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

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

LCS ID: VS03C08L1C

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	50.0	50.0	44.4	48.6	89	89	97	97	9	9
Trichloroethene	↓	↓	51.1	53.4	102	102	107	107	4	4
Benzene			47.1	49.4	94	94	99	99	5	5
Toluene			50.6	52.5	101	101	105	105	4	4
Chlorobenzene			51.2	53.6	102	102	107	107	5	5

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

LDC #: 36282A1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

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

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

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. VC5 , V :

Conc. = $\frac{(2869118)(50)}{(1831262)(1.663)(5.0)}$

= 47.1 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 12, 2016

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C070

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-001	16C070-01	Soil	03/08/16
KCH067-002	16C070-02	Soil	03/08/16
KCH067-003	16C070-03	Soil	03/08/16
KCH067-004**	16C070-04**	Soil	03/08/16
KCH067-003MS	16C070-03MS	Soil	03/08/16
KCH067-003MSD	16C070-03MSD	Soil	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270C using Selected Ion Monitoring (SIM)

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

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

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

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

V. Laboratory Blanks

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

VI. Field Blanks

Sample KCH067-019 (from SDG 16C074) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

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

VIII. Matrix Spike/Matrix Spike Duplicates

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

IX. Laboratory Control Samples

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

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

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

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

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

XIV. System Performance

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

XV. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

METHOD SW3550B/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS SIM

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 11:10
Sample ID:	KCH067-001	Date Analyzed:	03/16/16 14:09
Lab Samp ID:	C070-01	Dilution Factor:	1
Lab File ID:	RCJ209	Matrix	: SOIL
Ext Btch ID:	SVC013S	% Moisture	: 4.3
Calib. Ref.:	RBJ007	Instrument ID	: T-OE4

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ACENAPHTHENE	ND	10	1.3	2.6
ACENAPHTHYLENE	ND	10	1.3	2.6
ANTHRACENE	ND	10	1.3	2.6
BENZO(A)ANTHRACENE	ND	10	2.6	5.2
BENZO(A)PYRENE	ND	10	1.3	2.6
BENZO(B)FLUORANTHENE	1.6J	10	1.3	2.6
BENZO(K)FLUORANTHENE	ND	10	1.3	2.6
BENZO(G,H,I)PERYLENE	3.3J	10	1.3	2.6
CHRYSENE	ND	10	2.3	5.2
DIBENZO(A,H)ANTHRACENE	ND	10	1.3	2.6
FLUORANTHENE	1.6J	10	1.3	2.6
FLUORENE	ND	10	1.3	2.6
INDENO(1,2,3-CD)PYRENE	1.5J	10	1.3	2.6
NAPHTHALENE	ND	10	1.3	2.6
PHENANTHRENE	ND	10	1.3	2.6
PYRENE	1.5J	10	1.3	2.6
2-METHYLNAPHTHALENE	ND	10	1.3	2.6
1-METHYLNAPHTHALENE	ND	10	1.3	2.6

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	643	696.7	92.3	46-115
NITROBENZENE-D5	677	696.7	97.2	44-125
TERPHENYL-D14	833	696.7	120	58-133

KC01716

METHOD SW3550B/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS SIM

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C070	Date Extracted: 03/15/16 11:10
Sample ID: KCH067-002	Date Analyzed: 03/16/16 14:28
Lab Samp ID: C070-02	Dilution Factor: 1
Lab File ID: RCJ210	Matrix : SOIL
Ext Btch ID: SVC013S	% Moisture : 9.0
Calib. Ref.: RBJ007	Instrument ID : T-0E4

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ACENAPHTHENE	ND	11	1.4	2.7
ACENAPHTHYLENE	ND	11	1.4	2.7
ANTHRACENE	ND	11	1.4	2.7
BENZO(A)ANTHRACENE	ND	11	2.7	5.5
BENZO(A)PYRENE	ND	11	1.4	2.7
BENZO(B)FLUORANTHENE	ND	11	1.4	2.7
BENZO(K)FLUORANTHENE	ND	11	1.4	2.7
BENZO(G,H,I)PERYLENE	3.6J	11	1.4	2.7
CHRYSENE	ND	11	2.4	5.5
DIBENZO(A,H)ANTHRACENE	ND	11	1.4	2.7
FLUORANTHENE	ND	11	1.4	2.7
FLUORENE	ND	11	1.4	2.7
INDENO(1,2,3-CD)PYRENE	ND	11	1.4	2.7
NAPHTHALENE	ND	11	1.4	2.7
PHENANTHRENE	ND	11	1.4	2.7
PYRENE	ND	11	1.4	2.7
2-METHYLNAPHTHALENE	2.3J	11	1.4	2.7
1-METHYLNAPHTHALENE	2.4J	11	1.4	2.7

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	603	732.6	82.4	46-115
NITROBENZENE-D5	648	732.6	88.4	44-125
TERPHENYL-D14	815	732.6	111	58-133

8/05/16

METHOD SW3550B/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS SIM

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C070	Date Extracted: 03/15/16 11:10
Sample ID: KCH067-003	Date Analyzed: 03/16/16 14:48
Lab Samp ID: C070-03	Dilution Factor: 1
Lab File ID: RCJ211	Matrix : SOIL
Ext Btch ID: SVC013S	% Moisture : 6.9
Calib. Ref.: RBJ007	Instrument ID : T-OE4

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ACENAPHTHENE	2.6J	11	1.3	2.7
ACENAPHTHYLENE	2.5J	11	1.3	2.7
ANTHRACENE	ND	11	1.3	2.7
BENZO(A)ANTHRACENE	2.9J	11	2.6	5.4
BENZO(A)PYRENE	ND	11	1.3	2.7
BENZO(B)FLUORANTHENE	4.9J	11	1.3	2.7
BENZO(K)FLUORANTHENE	ND	11	1.3	2.7
BENZO(G,H,I)PERYLENE	2.6J	11	1.3	2.7
CHRYSENE	3.7J	11	2.4	5.4
DIBENZO(A,H)ANTHRACENE	ND	11	1.3	2.7
FLUORANTHENE	ND	11	1.3	2.7
FLUORENE	1.8J	11	1.3	2.7
INDENO(1,2,3-CD)PYRENE	ND	11	1.3	2.7
NAPHTHALENE	3.4J	11	1.3	2.7
PHENANTHRENE	ND	11	1.3	2.7
PYRENE	2.7J	11	1.3	2.7
2-METHYLNAPHTHALENE	2.7J	11	1.3	2.7
1-METHYLNAPHTHALENE	2.7J	11	1.3	2.7

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	653	716.1	91.3	46-115
NITROBENZENE-D5	696	716.1	97.2	44-125
TERPHENYL-D14	803	716.1	112	58-133

051716

METHOD SW3550B/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS SIM

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 11:10
Sample ID:	KCH067-004	Date Analyzed:	03/16/16 15:08
Lab Samp ID:	C070-04	Dilution Factor:	1
Lab File ID:	RCJ212	Matrix :	SOIL
Ext Btch ID:	SVC013S	% Moisture :	4.9
Calib. Ref.:	RBJ007	Instrument ID :	T-OE4

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ACENAPHTHENE	ND	11	1.3	2.6
ACENAPHTHYLENE	ND	11	1.3	2.6
ANTHRACENE	ND	11	1.3	2.6
BENZO(A)ANTHRACENE	ND	11	2.6	5.3
BENZO(A)PYRENE	ND	11	1.3	2.6
BENZO(B)FLUORANTHENE	ND	11	1.3	2.6
BENZO(K)FLUORANTHENE	ND	11	1.3	2.6
BENZO(G,H,I)PERYLENE	ND	11	1.3	2.6
CHRYSENE	ND	11	2.3	5.3
DIBENZO(A,H)ANTHRACENE	ND	11	1.3	2.6
FLUORANTHENE	ND	11	1.3	2.6
FLUORENE	ND	11	1.3	2.6
INDENO(1,2,3-CD)PYRENE	ND	11	1.3	2.6
NAPHTHALENE	ND	11	1.3	2.6
PHENANTHRENE	ND	11	1.3	2.6
PYRENE	ND	11	1.3	2.6
2-METHYLNAPHTHALENE	ND	11	1.3	2.6
1-METHYLNAPHTHALENE	ND	11	1.3	2.6

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	621	701.1	88.6	46-115
NITROBENZENE-D5	663	701.1	94.6	44-125
TERPHENYL-D14	803	701.1	115	58-133

3/25/16

LDC #: 36282A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C070 Standard/Full Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/Δ	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/Δ	%RSD ≤ 15, r² ICV ≤ 20
IV.	Continuing calibration /ending ccv	Δ	ccv ≤ 20
V.	Laboratory Blanks	Δ	
VI.	Field blanks	ND	EB= KCH067-019 (SDG # 16C071)
VII.	Surrogate spikes	Δ	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	Δ	
XII.	Compound quantitation RL/LOQ/LODs	Δ	Not reviewed for Standard validation.
XIII.	Target compound identification	Δ	Not reviewed for Standard validation.
XIV.	System performance	Δ	Not reviewed for Standard validation.
XV.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-001	16C070-01	Soil	03/08/16
2	KCH067-002	16C070-02	Soil	03/08/16
3	KCH067-003	16C070-03	Soil	03/08/16
4	KCH067-004**	16C070-04**	Soil	03/08/16
5	KCH067-003MS	16C070-03MS	Soil	03/08/16
6	KCH067-003MSD	16C070-03MSD	Soil	03/08/16
7				
8				
9				

Notes:

	MBLK1S						

LDC #: 36282A2b

VALIDATION FINDINGS CHECKLIST

Reviewer: EP
2nd Reviewer: K

Method: Semivolatiles (EPA SW 846 Method 8270C-SIM)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check (Not required)				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 15% and relative response factors (RRF) ≥ 0.05?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤20% or percent recoveries (%R) 80-120%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent differences (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	

LDC #: 36262Ab6 **VALIDATION FINDINGS CHECKLIST** Page: 2 of 2
Reviewer: FT
2nd Reviewer: TC

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

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

LDC #: 36282B2b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)
The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Internal Standard)	Reported RRF (10 std)	Recalculated RRF (10 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	2/2/16	S (1st IS)	3.981	3.981	4.006	4.006	3.76	3.76
			YY (2nd IS)	1.437	1.437	1.451	1.451	9.00	9.00
			III (3rd IS)	1.165	1.165	1.083	1.083	11.33	11.33
			(4th IS)						
			(5th IS)						
			(6th IS)						
2			(1st IS)						
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						
3			(1st IS)						
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						

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

LDC #: 36282426

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)
The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

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

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

#	Standard ID	Calibration Date	Compound (Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	RCA193 CCV	3/16/16	S (1st IS)	4.006	3.873	3.873	3.3	3.3
			YY (2nd IS)	1.451	1.395	1.395	3.9	3.9
			III (3rd IS)	1.083	1.149	1.149	6.1	6.1
			(4th IS)					
			(5th IS)					
			(6th IS)					
2			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
3			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					

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

LDC #: 36282A2b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer: ↑

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

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #4

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	10	9.46	94.6	94.6	0
2-Fluorobiphenyl	↓	8.86	88.6	88.6	↓
Terphenyl-d14	↓	11.46	115	115	↓
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 36282A26

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

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

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

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

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

MS/MSD samples: 5 + 6

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene	1430	1430	2.61	1050	1050	73	73	73	73	0	0
Pentachlorophenol											
Pyrene	↓	↓	2.68	1370	1320	95	95	92	92	4	4

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

LDC #: 36282A2b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer: A

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

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

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

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

LCS/LCSD samples: SYC013SL/SC

Compound	Spike Added (ug/kg)		Spike Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol										
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene	1330	1330	967	932	73	73	70	70	4	4
Pentachlorophenol										
Pyrene	↓	↓	1230	1230	92	92	92	92	0	0

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

LDC #: 36282A2b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer: JT

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

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

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

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

Example:

Sample I.D. LCS, Acenaphthene

Conc. = $\frac{(599770)(40)(2)(1000)}{(552251)(2.994)(30)}$

= 967 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 12, 2016

Parameters: Chlorinated Pesticides

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C070

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-001	16C070-01	Soil	03/08/16
KCH067-002	16C070-02	Soil	03/08/16
KCH067-003	16C070-03	Soil	03/08/16
KCH067-004**	16C070-04**	Soil	03/08/16
KCH067-003MS	16C070-03MS	Soil	03/08/16
KCH067-003MSD	16C070-03MSD	Soil	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8081A

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance 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 and Initial Calibration Verification

An 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.

Retention time windows were established as required by the method for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

The percent differences (%D) of the initial calibration verification (ICV) standard 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.

Retention times of all compounds in the calibration standards were within the established retention time windows for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

V. Laboratory Blanks

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

VI. Field Blanks

Sample KCH067-019 (from SDG 16C074) was identified as an equipment blank. No contaminants were found.

VII. Surrogates

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

VIII. Matrix Spike/Matrix Spike Duplicates

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

IX. Laboratory Control Samples

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

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Compound Quantitation

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

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
KCH067-001	Aldrin Dieldrin 4,4'-DDE	109 113 66	J (all detects) J (all detects) J (all detects)	A
KCH067-003	Dieldrin 4,4'-DDT	111 156	J (all detects) J (all detects)	A
KCH067-004**	Dieldrin Endosulfan II	122 108	J (all detects) J (all detects)	A

Raw data were not reviewed for Level III validation.

XII. Target Compound Identification

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

XIII. System Performance

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

XIII. Overall Assessment of Data

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

Due to RPD between two columns, data were qualified as estimated in three samples.

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

China Lake CTO 067
Chlorinated Pesticides - Data Qualification Summary - SDG 16C070

Sample	Compound	Flag	A or P	Reason (Code)
KCH067-001	Aldrin Dieldrin 4,4'-DDE	J (all detects) J (all detects) J (all detects)	A	Compound quantitation (RPD between two columns) (12)
KCH067-003	Dieldrin 4,4'-DDT	J (all detects) J (all detects)	A	Compound quantitation (RPD between two columns) (12)
KCH067-004**	Dieldrin Endosulfan II	J (all detects) J (all detects)	A	Compound quantitation (RPD between two columns) (12)

China Lake CTO 067
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C070	Date Extracted: 03/14/16 14:44
Sample ID: KCH067-001	Date Analyzed: 03/19/16 07:44
Lab Samp ID: C070-01	Dilution Factor: 1
Lab File ID: RC18055A	Matrix : SOIL
Ext Btch ID: CPC011S	% Moisture : 4.3
Calib. Ref.: RC18052A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND	2.1	0.21	0.42
GAMMA-BHC (LINDANE)	(ND)	0.42J	2.1	0.21	0.42
BETA-BHC	(ND)	ND	2.1	0.21	0.42
HEPTACHLOR	0.43J	(ND)	2.1	0.21	0.42
DELTA-BHC	(ND)	ND	2.1	0.28	0.42
ALDRIN	0.95J	(0.28J) J(12)	2.1	0.21	0.42
HEPTACHLOR EPOXIDE	1.2J	(ND)	2.1	0.21	0.42
GAMMA-CHLORDANE	(ND)	ND	2.1	0.21	0.42
ALPHA-CHLORDANE	(ND)	ND	2.1	0.21	0.42
ENDOSULFAN I	(ND)	0.75J	2.1	0.21	0.42
4,4'-DDE	7.7	(3.9) J(12)	2.1	0.21	0.42
DIELDRIN	4.3	(1.2J) J(12)	2.1	0.21	0.42
ENDRIN	(ND)	2.7	2.1	0.21	0.42
4,4'-DDD	(ND)	ND	2.1	0.21	0.42
ENDOSULFAN II	1.6J	(ND)	2.1	0.21	0.42
4,4'-DDT	(ND)	19	2.1	0.21	0.42
ENDRIN ALDEHYDE	(ND)	ND	2.1	0.37	0.42
ENDOSULFAN SULFATE	(ND)	ND	2.1	0.21	0.42
ENDRIN KETONE	0.31J	(ND)	2.1	0.21	0.42
METHOXYCHLOR	2.8J	(ND)	10	2.1	4.2
TOXAPHENE	(ND)	ND	52	5.2	10
TECHNICAL CHLORDANE	(ND)	ND	52	10	21

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	12.72 (14.06)	13.93	91.3 (101)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

SG 5/17/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C070	Date Extracted: 03/14/16 14:44
Sample ID: KCH067-002	Date Analyzed: 03/19/16 08:04
Lab Samp ID: C070-02	Dilution Factor: 1
Lab File ID: RC18056A	Matrix : SOIL
Ext Btch ID: CPC011S	% Moisture : 9.0
Calib. Ref.: RC18052A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND) | ND	2.2	0.22	0.44
GAMMA-BHC (LINDANE)	(ND) | ND	2.2	0.22	0.44
BETA-BHC	(ND) | ND	2.2	0.22	0.44
HEPTACHLOR	(ND) | ND	2.2	0.22	0.44
DELTA-BHC	(ND) | ND	2.2	0.30	0.44
ALDRIN	(ND) | ND	2.2	0.22	0.44
HEPTACHLOR EPOXIDE	(ND) | ND	2.2	0.22	0.44
GAMMA-CHLORDANE	(ND) | ND	2.2	0.22	0.44
ALPHA-CHLORDANE	(ND) | ND	2.2	0.22	0.44
ENDOSULFAN I	(ND) | ND	2.2	0.22	0.44
4,4'-DDE	0.39J | (ND)	2.2	0.22	0.44
DIELDRIN	0.33J | (ND)	2.2	0.22	0.44
ENDRIN	(ND) | ND	2.2	0.22	0.44
4,4'-DDD	(ND) | ND	2.2	0.22	0.44
ENDOSULFAN II	(ND) | ND	2.2	0.22	0.44
4,4'-DDT	(ND) | 1.7J	2.2	0.22	0.44
ENDRIN ALDEHYDE	(ND) | ND	2.2	0.38	0.44
ENDOSULFAN SULFATE	(ND) | ND	2.2	0.22	0.44
ENDRIN KETONE	(ND) | ND	2.2	0.22	0.44
METHOXYCHLOR	(ND) | ND	11	2.2	4.4
TOXAPHENE	(ND) | ND	55	5.5	11
TECHNICAL CHLORDANE	(ND) | ND	55	11	22

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	13.05 | (13.63)	14.65	89.1 | (93.0)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

3/21/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C070	Date Extracted: 03/14/16 14:44
Sample ID: KCH067-003	Date Analyzed: 03/19/16 08:24
Lab Samp ID: C070-03	Dilution Factor: 1
Lab File ID: RC18057A	Matrix : SOIL
Ext Btch ID: CPC011S	% Moisture : 6.9
Calib. Ref.: RC18052A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND) | ND	2.1	0.21	0.43
GAMMA-BHC (LINDANE)	(ND) | ND	2.1	0.21	0.43
BETA-BHC	(ND) | ND	2.1	0.21	0.43
HEPTACHLOR	0.32J | (ND)	2.1	0.21	0.43
DELTA-BHC	(ND) | ND	2.1	0.29	0.43
ALDRIN	3.3 | (ND)	2.1	0.21	0.43
HEPTACHLOR EPOXIDE	(ND) | ND	2.1	0.21	0.43
GAMMA-CHLORDANE	(ND) | ND	2.1	0.21	0.43
ALPHA-CHLORDANE	(ND) | ND	2.1	0.21	0.43
ENDOSULFAN I	(ND) | 1.4J	2.1	0.21	0.43
4,4'-DDE	15 | (ND)	2.1	0.21	0.43
DIELDRIN	8.4 | (2.4) J(12)	2.1	0.21	0.43
ENDRIN	(ND) | 5.9	2.1	0.21	0.43
4,4'-DDD	(ND) | 0.74J	2.1	0.21	0.43
ENDOSULFAN II	(ND) | ND	2.1	0.21	0.43
4,4'-DDT	(6.9) | 56 J(12)	2.1	0.21	0.43
ENDRIN ALDEHYDE	(ND) | ND	2.1	0.38	0.43
ENDOSULFAN SULFATE	(ND) | 1.8J	2.1	0.21	0.43
ENDRIN KETONE	0.85J | (ND)	2.1	0.21	0.43
METHOXYCHLOR	19 | (ND)	11	2.1	4.3
TOXAPHENE	(ND) | ND	54	5.4	11
TECHNICAL CHLORDANE	(ND) | ND	54	11	21

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	14.41 | (15.37)	14.32	101 | (107)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

TG 51716

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C070	Date Extracted: 03/14/16 14:44
Sample ID: KCH067-004	Date Analyzed: 03/19/16 09:25
Lab Samp ID: C070-04	Dilution Factor: 1
Lab File ID: RC18060A	Matrix : SOIL
Ext Btch ID: CPC011S	% Moisture : 4.9
Calib. Ref.: RC18052A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND	2.1	0.21	0.42
GAMMA-BHC (LINDANE)	(ND)	ND	2.1	0.21	0.42
BETA-BHC	(ND)	ND	2.1	0.21	0.42
HEPTACHLOR	(ND)	ND	2.1	0.21	0.42
DELTA-BHC	(ND)	ND	2.1	0.28	0.42
ALDRIN	0.35J	(ND)	2.1	0.21	0.42
HEPTACHLOR EPOXIDE	0.35J	(ND)	2.1	0.21	0.42
GAMMA-CHLORDANE	(ND)	ND	2.1	0.21	0.42
ALPHA-CHLORDANE	0.92J	(ND)	2.1	0.21	0.42
ENDOSULFAN I	(ND)	ND	2.1	0.21	0.42
4,4'-DDE	2.2	(ND)	2.1	0.21	0.42
DIELDRIN	1.4J	(0.34J) J (12)	2.1	0.21	0.42
ENDRIN	(ND)	0.72J	2.1	0.21	0.42
4,4'-DDD	(ND)	ND	2.1	0.21	0.42
ENDOSULFAN II	(0.36J)	1.2J J(12)	2.1	0.21	0.42
4,4'-DDT	(ND)	7.2	2.1	0.21	0.42
ENDRIN ALDEHYDE	(ND)	ND	2.1	0.37	0.42
ENDOSULFAN SULFATE	(ND)	0.21J	2.1	0.21	0.42
ENDRIN KETONE	(ND)	ND	2.1	0.21	0.42
METHOXYCHLOR	(ND)	ND	11	2.1	4.2
TOXAPHENE	(ND)	ND	53	5.3	11
TECHNICAL CHLORDANE	(ND)	ND	53	11	21

SURROGATE PARAMETERS	RESULTS		SPK_AMT	% RECOVERY		QC LIMIT
TETRACHLORO-M-XYLENE	13.43	(14.66)	14.02	95.8	(105)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

LDC #: 36282A3a
SDG #: 16C070
Laboratory: EMAX Laboratories Inc.

VALIDATION COMPLETENESS WORKSHEET
Standard/Full

Date: 5/9/16
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW846 Method 8081A)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC Instrument Performance Check	A	
III.	Initial calibration/ICV	A / A	%D psp / ICV ≤ 20
IV.	Continuing calibration	A	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = KCH067-019 (SDG # 16C074)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Compound quantitation/RL/LOQ/LODs	SW	Not reviewed for Standard validation.
XII.	Target compound identification	A	Not reviewed for Standard validation.
XIII.	System Performance	A	Not reviewed for Standard validation.
XIV	Overall assessment of data	A	

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

** Indicates sample underwent Full validation

	Client ID	Lab ID	Matrix	Date
1	KCH067-001	16C070-01	Soil	03/08/16
2	KCH067-002	16C070-02	Soil	03/08/16
3	KCH067-003	16C070-03	Soil	03/08/16
4	KCH067-004**	16C070-04**	Soil	03/08/16
5	KCH067-003MS	16C070-03MS	Soil	03/08/16
6	KCH067-003MSD	16C070-03MSD	Soil	03/08/16
7				
8				
9				
10				
11				

Notes:

	MBLK1S						

LDC #: 36282A3a

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer: M

Method: Pesticides (EPA SW 846 Method 8081)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?	✓			
Were Evaluation mix standards analyzed prior to the initial calibration and at beginning of each 12-hour shift?	✓			
Were endrin and 4,4'-DDT breakdowns ≤ 15% for individual breakdown in the Evaluation mix standards?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?		✓		
Were the RT windows properly established?	✓			
IIIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.			✓	
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes/Internal Standards				
Were all surrogate percent recovery (%R) within the QC limits?	✓			

LDC #: 36282A3a

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recovery (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
Were internal standard area counts within ± 50% of the average area calculated during calibration?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓	~~✓~~	F7	
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?	✓			
Were relative percent difference (RPD) of the results between two columns ≤ 40%?	F7 ~~✓~~	✓		
XII. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPA SW 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. Arochlor 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:_____

LDC #: 36287A3a

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

METHOD: ✓ GC __ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

code = 12

#	Associated Samples	Compound Name	% RPD But 2 col ≤ 40 Findings	Qualifications
	1	F	109	J (all) / A
		I	113	
		J	66	
	3	I	111	
		O	156	
	4	I	122	
		L	108	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 36282A3a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

METHOD: GC Pesticides (EPA SW 846 Method 8081)

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (20 std)/200	Recalculated CF (20 std)/200	Reported CF (initial)	Recalculated CF (intial)	Reported %RSD	Recalculated %RSD
1	ICA L	1/21/16	endosulfan I	431064	431064	419333.4	419333.4	12.1	12.1
	RTX cup1		Methoxychlor	146220	146220	164669.2	164669.2	15.4	15.4
2	RTX cup2		↓	107259	107259	105819.2	105819.2	5.8	5.8
				44563	44563	45652.3	45652.3	5.4	5.4
3									
4									

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

LDC #: 36282A3a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 6 of 7
Reviewer: FT
2nd Reviewer: A

METHOD: GC Pesticides (EPA SW 846 Method 8081)

Percent difference (%D) = 100 * (N - C)/N

Where: N = Initial Calibration Factor or Nominal Amount (ng)
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount (ng)

Standard ID	Calibration Date/Time	Compound	Average CF/ CCV Conc	Reported CF/Conc CCV	Recalculated CF/Conc CCV	Reported %D	Recalculated %D
CCV 1607	3/18/16	endosulfan / RTX cap1	20.0	17.62	17.62	12	12
		methoxychlor	200.0	211.66	211.66	6	6
		↓ RTX cap2		19.51	19.51	2	2
			↓	218.07	218.07	9	9
CCV 0643	3/19/16	↓	20.0	18.54	18.54	7	7
			200.0	226.93	226.93	13	13
				20.05	20.05	0	0
		↓	↓	231.56	231.56	16	16

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

LDC #: 36287A3a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer: n

METHOD: GC Pesticides (EPA SW 846 Method 8081)

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #4

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene	RTX CLP I	40.0	38.310	95.8	95.8	0
Tetrachloro-m-xylene	RTX CLP II	↓	41.840	105	105	0
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Notes:

LDC #: 36287T3a

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer: AC

METHOD: GC Pesticides (EPA SW 846 Method 8081)

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

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = I MS - MSD I * 2/(MS + MSD)

MS = Matrix spike percent recovery

MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 5 + 6

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	7.16	7.16	ND	8.24	8.18	115	115	114	114	1	1
4,4'-DDT	7.16	7.16	6.9	16.3	16.1	131	131	128	128	1	1

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

LDC #: 36282T3a

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: RZ
2nd Reviewer: DL

METHOD: GC Pesticides (EPA SW 846 Method 8081A)

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

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = I LCS - LCSD I * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: OPC 0115L / SC

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	6.67	6.67	6.18	6.16	93	93	92	92	0	0
4,4'-DDT	↓	↓	6.55	7.22	98	98	108	109	10	10

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

LDC #: 36287T3a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: EJ
2nd reviewer: JC

METHOD: GC Pesticides (EPA SW 846 Method 8081A)

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

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

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

Example:

Sample I.D. #4 , endosulfan II

Conc. = $\frac{379617 \quad (10)}{367000.6 \quad (30.01) \quad (0.951)}$

=

0.36 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 11, 2016

Parameters: Polychlorinated Biphenyls

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C070

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-001	16C070-01	Soil	03/08/16
KCH067-002	16C070-02	Soil	03/08/16
KCH067-003	16C070-03	Soil	03/08/16
KCH067-004**	16C070-04**	Soil	03/08/16
KCH067-003MS	16C070-03MS	Soil	03/08/16
KCH067-003MSD	16C070-03MSD	Soil	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An 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.

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

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.

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-019 (from SDG 16C074) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples 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) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

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

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
KCH067-001	Aroclor-1260	73	J (all detects)	A
KCH067-002	Aroclor-1254	56	J (all detects)	A
KCH067-003	Aroclor-1260	77	J (all detects)	A
KCH067-004**	Aroclor-1260	63	J (all detects)	A

Raw data were not reviewed for Level III validation.

XI. Target Compound Identification

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

XII. Overall Assessment of Data

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

Due to RPD between two columns, data were qualified as estimated in four samples.

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

China Lake CTO 067
Polychlorinated Biphenyls - Data Qualification Summary - SDG 16C070

Sample	Compound	Flag	A or P	Reason (Code)
KCH067-001 KCH067-003 KCH067-004**	Aroclor-1260	J (all detects)	A	Compound quantitation (RPD between two columns) (12)
KCH067-002	Aroclor-1254	J (all detects)	A	Compound quantitation (RPD between two columns) (12)

China Lake CTO 067
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

METHOD SW3550B/8082
PCBs

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C070	Date Extracted: 03/14/16 14:44
Sample ID: KCH067-001	Date Analyzed: 03/15/16 11:36
Lab Samp ID: C070-01	Dilution Factor: 1
Lab File ID: SC15007A	Matrix : SOIL
Ext Btch ID: CPC011S	% Moisture : 4.3
Calib. Ref.: SC15002A	Instrument ID : GCT008

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
AROCLOR 1016	(ND) | ND	52	14	18
AROCLOR 1221	(ND) | ND	52	8.7	18
AROCLOR 1232	(ND) | ND	52	9.4	18
AROCLOR 1242	(ND) | ND	52	9.7	18
AROCLOR 1248	(ND) | ND	52	8.7	18
AROCLOR 1254	(260) | 260	52	8.7	18
AROCLOR 1260	69 | (32J) J (12)	52	10	18

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	14.08 | (15.37)	13.93	101 | (110)	44-130

Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )
* Out side of QC Limit

3/16/16

METHOD SW3550B/8082
PCBs

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C070	Date Extracted: 03/14/16 14:44
Sample ID: KCH067-002	Date Analyzed: 03/15/16 11:54
Lab Samp ID: C070-02	Dilution Factor: 1
Lab File ID: SC15008A	Matrix : SOIL
Ext Btch ID: CPC011S	% Moisture : 9.0
Calib. Ref.: SC15002A	Instrument ID : GCT008

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
AROCLOR 1016	(ND) | ND	55	14	19
AROCLOR 1221	(ND) | ND	55	9.1	19
AROCLOR 1232	(ND) | ND	55	9.9	19
AROCLOR 1242	(ND) | ND	55	10	19
AROCLOR 1248	(ND) | ND	55	9.1	19
AROCLOR 1254	(23J) | 13J J (12)	55	9.1	19
AROCLOR 1260	(ND) | ND	55	11	19

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	13.20 | (14.39)	14.65	90.1 | (98.2)	44-130

Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )
* Out side of QC Limit

8/05/16

METHOD SW3550B/8082
PCBs

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C070	Date Extracted: 03/14/16 14:44
Sample ID: KCH067-003	Date Analyzed: 03/15/16 12:11
Lab Samp ID: C070-03	Dilution Factor: 1
Lab File ID: SC15009A	Matrix : SOIL
Ext Btch ID: CPC011S	% Moisture : 6.9
Calib. Ref.: SC15002A	Instrument ID : GCT008

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
AROCLOR 1016	(ND) | ND	54	14	18
AROCLOR 1221	(ND) | ND	54	8.9	18
AROCLOR 1232	(ND) | ND	54	9.7	18
AROCLOR 1242	(ND) | ND	54	10	18
AROCLOR 1248	(ND) | ND	54	8.9	18
AROCLOR 1254	570 | (580)	54	8.9	18
AROCLOR 1260	160 | (71) J (12)	54	11	18

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	14.15 | (15.37)	14.32	98.8 | (107)	44-130

Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )
* Out side of QC Limit

4/05/16

METHOD SW3550B/8082
PCBs

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/14/16 14:44
Sample ID	: KCH067-004	Date Analyzed:	03/15/16 13:03
Lab Samp ID	: C070-04	Dilution Factor:	1
Lab File ID	: SC15012A	Matrix	: SOIL
Ext Btch ID	: CPC011S	% Moisture	: 4.9
Calib. Ref.:	SC15002A	Instrument ID	: GCT008

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
AROCLOR 1016	(ND) | ND	53	14	18
AROCLOR 1221	(ND) | ND	53	8.7	18
AROCLOR 1232	(ND) | ND	53	9.5	18
AROCLOR 1242	(ND) | ND	53	9.8	18
AROCLOR 1248	(ND) | ND	53	8.7	18
AROCLOR 1254	(76) | 74	53	8.7	18
AROCLOR 1260	(21J) | 11J J(12)	53	10	18

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	13.56 | (14.77)	14.02	96.8 | (105)	44-130

Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )
* Out side of QC Limit

3/17/16

LDC #: 36282A3b

SDG #: 16C070

Laboratory: EMAX Laboratories Inc.

VALIDATION COMPLETENESS WORKSHEET

Standard/Full

Date: 5/9/16

Page: 1 of 1

Reviewer: EM

2nd Reviewer: M

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	
III.	Continuing calibration	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB= KCH067-019 (SDG # 16C074)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS ID
IX.	Field duplicates	N	
X.	Compound quantitation/RL/LOQ/LODs	SW	Not reviewed for Standard validation.
XI.	Target compound identification	A	Not reviewed for Standard validation.
XII.	Overall assessment of data	A	

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

** Indicates sample underwent Full validation

	Client ID	Lab ID	Matrix	Date
1	KCH067-001	16C070-01	Soil	03/08/16
2	KCH067-002	16C070-02	Soil	03/08/16
3	KCH067-003	16C070-03	Soil	03/08/16
4	KCH067-004**	16C070-04**	Soil	03/08/16
5	KCH067-003MS	16C070-03MS	Soil	03/08/16
6	KCH067-003MSD	16C070-03MSD	Soil	03/08/16
7				
8				
9				
10				
11				
12				
13				

Notes:

	MBLK15						

LDC #: 36282A36 **VALIDATION FINDINGS CHECKLIST** Page: 1 of 2
Reviewer: FR
2nd Reviewer:

Method: ✓ GC _____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?		✓		
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) < 20% or percent recoveries (%R) 80-120%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.				
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 36282A36

VALIDATION FINDINGS CHECKLIST

Reviewer: EJ
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 36282A3b

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

METHOD: ✓ **GC** __ **HPLC**

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

code = 12

#	Associated Samples	Compound Name	% RPD Bet 2 col ≤ 40 Findings	Qualifications
	1	BB	73	J dil /A
	2	AA	56	↓
	3	BB	77	↓
	4	BB	63	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 36282A3b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: A

METHOD: GC ✓ HPLC _____

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (100 std)	Recalculated CF (100 std)	Reported CF (initial)	Recalculated CF (intial)	Reported %RSD	Recalculated %RSD
1	ICAL RTX-CLP1	11/17/15	PCB-1260-1	3097.58	3097.58	3049.208	3049.208	14.2	14.2
	RTX-CLP2	↓	↓	3293.02	3293.02	3326.041	3326.041	13.6	13.6
2									
3									
4									

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

LDC #: 36282A36

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC _____

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

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	CCV 10:10	3/15/16	PCB-1260	500.0	498.754	498.754	0	0
2								
3								
4								

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

LDC #: 36282A3b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #4

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
TCMX	RTX CLP1	40.0	38.7	96.8	96.8	0
TCMX	CLP2	↓	42.14	105	105	0

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 36282A3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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

METHOD: ✓ GC ___HPLC

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

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where

SSC = Spiked sample concentration
SC = Sample concentration
SA = Spike added

MS = Matrix spike
MSD = Matrix spike duplicate

MS/MSD samples: 5 + 6

Compound	Spike Added (ug/kg)		Sample Conc. (ug/kg)	Spike Sample Concentration (ug/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											
Aroclor 1260	179	179	155	331	319	98	98	92	92	4	4

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

LDC #: 36282A36

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer: AC

METHOD: ✓ GC ___HPLC

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

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: 60C011SL/SC

Compound	Spike Added (ug/kg)		Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										
Aroclor 1260	167	167	169	169	101	101	101	101	0	0

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

LDC #: 36282A3b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

METHOD: ✓ GC ___ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. # 4 Compound Name AA

Concentration = $\frac{216.39\ (10)}{(30.01)(0.95)}$ =

= 76 ug/kg

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications
	1254-1 = 59267 / 1689.4	= 35.08	1254-1 =	35.08	
			2 =	48.41	
			3 =	32.74	
			4 =	48.53	
			5 =	51.62	
			Total	= 216.39	

Comments: _____

LDC Report# 36282A4a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 24, 2016

Parameters: Metals

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C070

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-001	16C070-01	Soil	03/08/16
KCH067-002	16C070-02	Soil	03/08/16
KCH067-003	16C070-03	Soil	03/08/16
KCH067-004**	16C070-04**	Soil	03/08/16
KCH067-005	16C070-05	Soil	03/08/16
KCH067-006	16C070-06	Soil	03/08/16
KCH067-007	16C070-07	Soil	03/08/16
KCH067-008	16C070-08	Soil	03/08/16
KCH067-009	16C070-09	Soil	03/08/16
KCH067-010	16C070-10	Soil	03/08/16
KCH067-011	16C070-11	Soil	03/08/16
KCH067-012	16C070-12	Soil	03/08/16
KCH067-013	16C070-13	Soil	03/08/16
KCH067-014	16C070-14	Soil	03/08/16
KCH067-015	16C070-15	Soil	03/08/16
KCH067-016**	16C070-16**	Soil	03/08/16
KCH067-017	16C070-17	Soil	03/08/16
KCH067-018	16C070-18	Soil	03/08/16
KCH067-003MS	16C070-03MS	Soil	03/08/16
KCH067-003MSD	16C070-03MSD	Soil	03/08/16
KCH067-016MS	16C070-16MS	Soil	03/08/16
KCH067-016MSD	16C070-16MSD	Soil	03/08/16
KCH067-001DL	16C070-01DL	Soil	03/08/16
KCH067-002DL	16C070-02DL	Soil	03/08/16
KCH067-002RE	16C070-02RE	Soil	03/08/16
KCH067-003DL	16C070-03DL	Soil	03/08/16
KCH067-004RE**	16C070-04RE**	Soil	03/08/16

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-009RE	16C070-09RE	Soil	03/08/16
KCH067-010RE	16C070-10RE	Soil	03/08/16
KCH067-011DL	16C070-11DL	Soil	03/08/16
KCH067-016RE**	16C070-16RE**	Soil	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A
Mercury by EPA SW 846 Method 7471A

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

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

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

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

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
03/29/16	CCV (14:19)	Boron	182 (80-120)	KCH067-002RE KCH067-003DL KCH067-004RE** KCH067-009RE KCH067-011DL	J+ (all detects)	P
03/29/16	CCV (15:11)	Boron	187 (80-120)	KCH067-002RE KCH067-003DL KCH067-004RE** KCH067-009RE KCH067-011DL KCH067-016RE**	J+ (all detects)	P
03/29/16	CCV (16:00)	Boron	184 (80-120)	KCH067-016RE**	J+ (all detects)	P

IV. ICP Interference Check Sample Analysis

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

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Laboratory Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Selenium	0.100 ug/L	KCH067-001 KCH067-002 KCH067-003 KCH067-004** KCH067-005 KCH067-006 KCH067-007 KCH067-008 KCH067-009 KCH067-010 KCH067-011
ICB/CCB	Molybdenum	0.238 ug/L	KCH067-002RE KCH067-003DL KCH067-004RE** KCH067-009RE KCH067-011DL
ICB/CCB	Molybdenum	0.223 ug/L	KCH067-016RE**
ICB/CCB	Antimony	0.294	KCH067-002RE KCH067-003DL KCH067-004RE** KCH067-009RE KCH067-011DL KCH067-016RE**

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
KCH067-001	Selenium	0.130 mg/Kg	0.130U mg/Kg
KCH067-003	Selenium	0.176 mg/Kg	0.176U mg/Kg
KCH067-005	Selenium	0.0595 mg/Kg	0.0993U mg/Kg
KCH067-003DL	Molybdenum	2.92 mg/Kg	2.92U mg/Kg
KCH067-016RE**	Molybdenum	0.244 mg/Kg	0.244U mg/Kg
KCH067-003DL	Antimony	1.15 mg/Kg	2.10U mg/Kg
KCH067-004RE**	Antimony	0.350 mg/Kg	0.350U mg/Kg
KCH067-016RE**	Antimony	0.110 mg/Kg	0.198U mg/Kg

VI. Field Blanks

Sample KCH067-019 (from SDG 16C074) was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
KCH067-019	03/08/16	Boron Calcium Iron Lead Manganese Nickel Sodium	4.65 ug/L 135 ug/L 9.85 ug/L 0.225 ug/L 0.318 ug/L 0.161 ug/L 42.6 ug/L	All samples in SDG 16C070

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
KCH067-005	Boron	6.80 mg/Kg	6.80U mg/Kg
KCH067-006	Boron	4.94 mg/Kg	5.01U mg/Kg
KCH067-007	Boron	4.62 mg/Kg	4.90U mg/Kg
KCH067-008	Boron	4.50 mg/Kg	4.97U mg/Kg
KCH067-010	Boron	9.71 mg/Kg	9.71U mg/Kg
KCH067-013	Boron	8.91 mg/Kg	8.91U mg/Kg
KCH067-014	Boron	9.15 mg/Kg	9.15U mg/Kg
KCH067-016**	Boron	7.59 mg/Kg	7.59U mg/Kg
KCH067-018	Boron	9.82 mg/Kg	9.82U mg/Kg
KCH067-002DL	Boron	53.3 mg/Kg	53.3U mg/Kg
KCH067-010RE	Boron	9.62 mg/Kg	9.62U mg/Kg
KCH067-016RE**	Boron	7.20 mg/Kg	7.20U mg/Kg

VII. Matrix Spike/Matrix Spike Duplicates

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

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
KCH067-003MS/MSD (KCH067-003 KCH067-003DL)	Antimony	40 (72-124)	38 (72-124)	J- (all detects)	A
	Chromium	46 (83-119)	50 (83-119)	J- (all detects)	
	Copper	68 (84-119)	67 (84-119)	J- (all detects)	
	Lead	-48 (84-118)	-56 (84-118)	J- (all detects)	
	Sodium	75 (79-125)	71 (79-125)	J- (all detects)	
KCH067-016MS/MSD (KCH067-016** KCH067-016RE**)	Antimony	61 (72-124)	60 (72-124)	J- (all detects)	A
	Calcium	85 (86-118)	-	J- (all detects)	
	Chromium	83 (83-119)	-	J- (all detects)	
	Copper	80 (84-119)	78 (84-119)	J- (all detects)	
	Magnesium	56 (80-123)	67 (80-123)	J- (all detects)	
	Potassium	74 (85-119)	84 (85-119)	J- (all detects)	
	Vanadium	36 (82-116)	41 (82-116)	J- (all detects)	

For KCH067-003MS/MSD, no data were qualified for Aluminum, Boron, Calcium, Iron, Magnesium, Manganese, and Zinc percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

For KCH067-016MS/MSD, no data were qualified for Barium, Iron, and Manganese percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

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

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. The analysis criteria were met.

X. Laboratory Control Samples

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

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Level IV validation with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
KCH067-001 KCH067-003 KCH067-009 KCH067-016**	Boron	Sample result exceeded linear range.	Reported result should be within linear range.	J (all detects) J (all detects) J (all detects) J (all detects)	A
KCH067-002	Boron Calcium Iron Sodium	Sample result exceeded linear range.	Reported result should be within linear range.	J (all detects) J (all detects) J (all detects) J (all detects)	A
KCH067-002RE	Iron	Sample result exceeded linear range.	Reported result should be within linear range.	J (all detects)	A
KCH067-010	Calcium Iron Sodium	Sample result exceeded linear range.	Reported result should be within linear range.	J (all detects) J (all detects) J (all detects)	A
KCH067-011	Boron Zinc	Sample result exceeded linear range.	Reported result should be within linear range.	J (all detects) J (all detects)	A

Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Analyte	Flag	A or P
KCH067-001 KCH067-003 KCH067-009 KCH067-016**	Boron	R	A
KCH067-002	Boron Calcium Iron Sodium	R R R R	A
KCH067-010	Calcium Iron Sodium	R R R	A
KCH067-011	Boron Zinc	R R	A
KCH067-011DL	All analytes except Boron Zinc	R R	A
KCH067-001DL KCH067-003DL KCH067-004RE** KCH067-009RE KCH067-016RE**	All analytes except Boron	R	A
KCH067-002DL	All analytes except Iron	R	A
KCH067-002RE	All analytes except Boron Calcium Sodium	R	A
KCH067-010RE	All analytes except Calcium Iron Sodium	R	A

Due to calibration and MS/MSD %R, data were qualified as estimated in eight samples.

Due to laboratory blank contamination, data were qualified as not detected in three samples.

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

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

China Lake CTO 067
Metals - Data Qualification Summary - SDG 16C070

Sample	Analyte	Flag	A or P	Reason (Code)
KCH067-002RE KCH067-003DL KCH067-004RE** KCH067-009RE KCH067-011DL KCH067-016RE**	Boron	J+ (all detects)	P	Calibration (CCV) (%R) (5)
KCH067-003	Antimony Chromium Copper Lead Sodium	J- (all detects) J- (all detects) J- (all detects) J- (all detects) J- (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (8)
KCH067-016**	Antimony Calcium Chromium Copper Magnesium Potassium Vanadium	J- (all detects) J- (all detects) J- (all detects) J- (all detects) J- (all detects) J- (all detects) J- (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (8)
KCH067-001 KCH067-003 KCH067-009 KCH067-016**	Boron	R	A	Overall assessment of data (22)
KCH067-002	Boron Calcium Iron Sodium	R R R R	A	Overall assessment of data (22)
KCH067-010	Calcium Iron Sodium	R R R	A	Overall assessment of data (22)
KCH067-011	Boron Zinc	R R	A	Overall assessment of data (22)
KCH067-011DL	All analytes except Boron Zinc	R R	A	Overall assessment of data (22)
KCH067-001DL KCH067-003DL KCH067-004RE** KCH067-009RE KCH067-016RE**	All analytes except Boron	R	A	Overall assessment of data (22)
KCH067-002DL	All analytes except Iron	R	A	Overall assessment of data (22)

Sample	Analyte	Flag	A or P	Reason (Code)
KCH067-002RE	All analytes except Boron Calcium Sodium	R	A	Overall assessment of data (22)
KCH067-010RE	All analytes except Calcium Iron Sodium	R	A	Overall assessment of data (22)

China Lake CTO 067
Metals - Laboratory Blank Data Qualification Summary - SDG 16C070

Sample	Analyte	Modified Final Concentration	A or P	Code
KCH067-001	Selenium	0.130U mg/Kg	A	7
KCH067-003	Selenium	0.176U mg/Kg	A	7
KCH067-005	Selenium	0.0993U mg/Kg	A	7

China Lake CTO 067
Metals - Field Blank Data Qualification Summary - SDG 16C070

Sample	Analyte	Modified Final Concentration	A or P	Code
KCH067-005	Boron	6.80U mg/Kg	A	6
KCH067-006	Boron	5.01U mg/Kg	A	6
KCH067-007	Boron	4.90U mg/Kg	A	6
KCH067-008	Boron	4.97U mg/Kg	A	6
KCH067-010	Boron	9.71U mg/Kg	A	6
KCH067-013	Boron	8.91U mg/Kg	A	6
KCH067-014	Boron	9.15U mg/Kg	A	6
KCH067-018	Boron	9.82U mg/Kg	A	6
KCH067-016RE**	Boron	7.20U mg/Kg	A	6

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-001	Date Analyzed:	03/28/16 15:13
Lab Samp ID:	C070-01	Dilution Factor:	0.98
Lab File ID:	98C11043	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	4.3
Calib. Ref.:	98C11038	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	8910	102	10.2	20.5
Antimony	0.423J	0.512	0.102	0.205
Arsenic	4.48	0.512	0.0512	0.102
Barium	59.8	0.512	0.0737	0.102
Beryllium	0.315J	0.512	0.0512	0.102
Boron	197E R22	10.2	2.56	5.12
Cadmium	2.28	0.512	0.0584	0.102
Calcium	5050	102	17.4	20.5
Chromium	10.5	0.512	0.0512	0.102
Cobalt	6.08	0.512	0.0512	0.102
Copper	23.9	0.512	0.102	0.205
Iron	14100	102	5.12	10.2
Lead	21.7	0.512	0.0512	0.102
Magnesium	5670	102	10.2	20.5
Manganese	202	0.512	0.157	0.205
Molybdenum	2.24	0.512	0.102	0.205
Nickel	6.34	0.512	0.0645	0.102
Potassium	4280	102	10.2	20.5
Selenium	0.130J U (T)	0.512	0.0512	0.102
Silver	0.0842J	0.512	0.0512	0.102
Sodium	4220	102	10.2	20.5
Thallium	0.117J	0.512	0.0512	0.102
Vanadium	31.6	0.512	0.195	0.256
Zinc	57.5	2.05	0.699	1.02

4/7/16 9

7005

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-001DL	Date Analyzed:	03/28/16 17:58
Lab Samp ID:	C070-011	Dilution Factor:	9.8
Lab File ID:	98C11080	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	4.3
Calib. Ref.:	98C11074	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	9280 R22	1020	102	205
Antimony	ND	5.12	1.02	2.05
Arsenic	4.69J	5.12	0.512	1.02
Barium	59.6	5.12	0.737	1.02
Beryllium	ND	5.12	0.512	1.02
Boron	178	102	25.6	51.2
Cadmium	2.32J R22	5.12	0.584	1.02
Calcium	5530	1020	174	205
Chromium	11.2	5.12	0.512	1.02
Cobalt	6.64	5.12	0.512	1.02
Copper	26.8	5.12	1.02	2.05
Iron	15200	1020	51.2	102
Lead	23.1	5.12	0.512	1.02
Magnesium	5880	1020	102	205
Manganese	225	5.12	1.57	2.05
Molybdenum	2.20J	5.12	1.02	2.05
Nickel	6.90	5.12	0.645	1.02
Potassium	4590	1020	102	205
Selenium	ND	5.12	0.512	1.02
Silver	ND	5.12	0.512	1.02
Sodium	4550	1020	102	205
Thallium	ND	5.12	0.512	1.02
Vanadium	32.7	5.12	1.95	2.56
Zinc	63.4	20.5	6.99	10.2

5/17/16

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-002	Date Analyzed:	03/28/16 15:17
Lab Samp ID:	C070-02	Dilution Factor:	0.976
Lab File ID:	98C11044	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	9.0
Calib. Ref.:	98C11038	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)		LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	15200		107	10.7	21.5
Antimony	0.440J		0.536	0.107	0.215
Arsenic	10.2		0.536	0.0536	0.107
Barium	114		0.536	0.0772	0.107
Beryllium	0.535J		0.536	0.0536	0.107
Boron	53.5E	R22	10.7	2.68	5.36
Cadmium	0.574		0.536	0.0611	0.107
Calcium	16000E	R22	107	18.2	21.5
Chromium	14.3		0.536	0.0536	0.107
Cobalt	11.5		0.536	0.0536	0.107
Copper	38.5		0.536	0.107	0.215
Iron	27100E	R22	107	5.36	10.7
Lead	6.27		0.536	0.0536	0.107
Magnesium	9770		107	10.7	21.5
Manganese	342		0.536	0.164	0.215
Molybdenum	0.805		0.536	0.107	0.215
Nickel	11.0		0.536	0.0676	0.107
Potassium	5390		107	10.7	21.5
Selenium	ND		0.536	0.0536	0.107
Silver	0.0604J		0.536	0.0536	0.107
Sodium	3140E	R22	107	10.7	21.5
Thallium	0.222J		0.536	0.0536	0.107
Vanadium	67.4		0.536	0.204	0.268
Zinc	51.5		2.15	0.733	1.07

4/17/16

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-002RE	Date Analyzed:	03/29/16 14:27
Lab Samp ID:	C070-02N	Dilution Factor:	0.976
Lab File ID:	98C12018	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	9.0
Calib. Ref.:	98C12016	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)		LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	15100	R22	107	10.7	21.5
Antimony	0.452J		0.536	0.107	0.215
Arsenic	10.3		0.536	0.0536	0.107
Barium	110		0.536	0.0772	0.107
Beryllium	0.545		0.536	0.0536	0.107
Boron	51.5	J+	10.7 (LS)	2.68	5.36
Cadmium	0.524J	R22	0.536	0.0611	0.107
Calcium	16300		107	18.2	21.5
Chromium	14.6	R22	0.536	0.0536	0.107
Cobalt	11.5		0.536	0.0536	0.107
Copper	40.7		0.536	0.107	0.215
Iron	26100E		107	5.36	10.7
Lead	6.38		0.536	0.0536	0.107
Magnesium	10300		107	10.7	21.5
Manganese	337		0.536	0.164	0.215
Molybdenum	0.854		0.536	0.107	0.215
Nickel	10.9		0.536	0.0676	0.107
Potassium	5330		107	10.7	21.5
Selenium	ND		0.536	0.0536	0.107
Silver	0.0623J		0.536	0.0536	0.107
Sodium	3290		107	10.7	21.5
Thallium	0.241J	R22	0.536	0.0536	0.107
Vanadium	69.1		0.536	0.204	0.268
Zinc	53.6		2.15	0.733	1.07

5/17/16

METHOD SW6020A
METALS BY ICP-MS

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
SDG NO. : 16C070	Date Extracted: 03/17/16 15:19
Sample ID: KCH067-002DL	Date Analyzed: 03/28/16 18:03
Lab Samp ID: C070-02I	Dilution Factor: 4.88
Lab File ID: 98C11081	Matrix : SOIL
Ext Btch ID: IMC031S	% Moisture : 9.0
Calib. Ref.: 98C11074	Instrument ID : T-I98

PARAMETERS	RESULTS (mg/kg)		LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	16500	R2	536	53.6	107
Antimony	ND		2.68	0.536	1.07
Arsenic	10.3		2.68	0.268	0.536
Barium	117		2.68	0.386	0.536
Beryllium	0.553J		2.68	0.268	0.536
Boron	53.3J		53.6	13.4	26.8
Cadmium	0.502J		2.68	0.306	0.536
Calcium	17400		536	91.2	107
Chromium	15.1		2.68	0.268	0.536
Cobalt	12.5		2.68	0.268	0.536
Copper	43.8		2.68	0.536	1.07
Iron	29400		536	26.8	53.6
Lead	6.45	R2	2.68	0.268	0.536
Magnesium	10700		536	53.6	107
Manganese	373		2.68	0.820	1.07
Molybdenum	0.817J		2.68	0.536	1.07
Nickel	11.8		2.68	0.338	0.536
Potassium	5910		536	53.6	107
Selenium	ND		2.68	0.268	0.536
Silver	ND		2.68	0.268	0.536
Sodium	3380		536	53.6	107
Thallium	ND		2.68	0.268	0.536
Vanadium	69.2		2.68	1.02	1.34
Zinc	55.2		10.7	3.66	5.36

5/17/16 K

METHOD SW6020A
METALS BY ICP-MS

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
SDG NO. : 16C070	Date Extracted: 03/17/16 15:19
Sample ID: KCH067-003	Date Analyzed: 03/28/16 15:35
Lab Samp ID: C070-03	Dilution Factor: 0.976
Lab File ID: 98C11048	Matrix : SOIL
Ext Btch ID: IMC031S	% Moisture : 6.9
Calib. Ref.: 98C11038	Instrument ID : T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	11800	105	10.5	21.0
Antimony	0.728 J-(8)	0.524	0.105	0.210
Arsenic	6.99	0.524	0.0524	0.105
Barium	101	0.524	0.0755	0.105
Beryllium	0.418J	0.524	0.0524	0.105
Boron	180E R2	10.5	2.62	5.24
Cadmium	2.22	0.524	0.0598	0.105
Calcium	15600	105	17.8	21.0
Chromium	26.6 J-(8)	0.524	0.0524	0.105
Cobalt	8.28	0.524	0.0524	0.105
Copper	29.4 J-(8)	0.524	0.105	0.210
Iron	18300	105	5.24	10.5
Lead	64.1 J-(8)	0.524	0.0524	0.105
Magnesium	10100	105	10.5	21.0
Manganese	273	0.524	0.160	0.210
Molybdenum	2.72	0.524	0.105	0.210
Nickel	8.54	0.524	0.0660	0.105
Potassium	5190	105	10.5	21.0
Selenium	0.176J U (7)	0.524	0.0524	0.105
Silver	0.0775J	0.524	0.0524	0.105
Sodium	5550 J-(8)	105	10.5	21.0
Thallium	0.172J	0.524	0.0524	0.105
Vanadium	45.5	0.524	0.199	0.262
Zinc	188	2.10	0.716	1.05

4/7/16 9

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-003DL	Date Analyzed:	03/29/16 14:45
Lab Samp ID:	C070-031	Dilution Factor:	9.76
Lab File ID:	98C12022	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	6.9
Calib. Ref.:	98C12016	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	12600 R22	1050	105	210
Antimony	1.15J	5.24	1.05	2.10
Arsenic	6.86	5.24	0.524	1.05
Barium	98.4	5.24	0.755	1.05
Beryllium	ND	5.24	0.524	1.05
Boron	149 J+(S)	105	26.2	52.4
Cadmium	1.88J R22	5.24	0.598	1.05
Calcium	16900	1050	178	210
Chromium	28.0	5.24	0.524	1.05
Cobalt	9.28	5.24	0.524	1.05
Copper	34.5	5.24	1.05	2.10
Iron	18900	1050	52.4	105
Lead	71.3	5.24	0.524	1.05
Magnesium	11600	1050	105	210
Manganese	299	5.24	1.60	2.10
Molybdenum	2.92J	5.24	1.05	2.10
Nickel	9.05	5.24	0.660	1.05
Potassium	5600	1050	105	210
Selenium	ND	5.24	0.524	1.05
Silver	ND	5.24	0.524	1.05
Sodium	6250	1050	105	210
Thallium	ND	5.24	0.524	1.05
Vanadium	46.5	5.24	1.99	2.62
Zinc	204	21.0	7.16	10.5

4/17/16 ✓

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-004	Date Analyzed:	03/28/16 15:57
Lab Samp ID:	C070-04	Dilution Factor:	0.971
Lab File ID:	98C11053	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	4.9
Calib. Ref.:	98C11050	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	8900	102	10.2	20.4
Antimony	0.346J	0.511	0.102	0.204
Arsenic	6.46	0.511	0.0511	0.102
Barium	66.9	0.511	0.0735	0.102
Beryllium	0.293J	0.511	0.0511	0.102
Boron	35.0 R2	10.2	2.55	5.11
Cadmium	0.284J	0.511	0.0582	0.102
Calcium	7410	102	17.4	20.4
Chromium	10.9	0.511	0.0511	0.102
Cobalt	7.37	0.511	0.0511	0.102
Copper	19.7	0.511	0.102	0.204
Iron	18700	102	5.11	10.2
Lead	6.19	0.511	0.0511	0.102
Magnesium	5970	102	10.2	20.4
Manganese	193	0.511	0.156	0.204
Molybdenum	0.631	0.511	0.102	0.204
Nickel	6.95	0.511	0.0643	0.102
Potassium	3430	102	10.2	20.4
Selenium	ND	0.511	0.0511	0.102
Silver	ND	0.511	0.0511	0.102
Sodium	2080	102	10.2	20.4
Thallium	0.133J	0.511	0.0511	0.102
Vanadium	48.6	0.511	0.194	0.255
Zinc	34.1	2.04	0.697	1.02

4/7/16 4

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-004RE	Date Analyzed:	03/29/16 14:54
Lab Samp ID:	C070-04N	Dilution Factor:	0.971
Lab File ID:	98C12024	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	4.9
Calib. Ref.:	98C12016	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	8760 R22	102	10.2	20.4
Antimony	0.350J	0.511	0.102	0.204
Arsenic	6.61	0.511	0.0511	0.102
Barium	65.7	0.511	0.0735	0.102
Beryllium	0.299J	0.511	0.0511	0.102
Boron	33.5 J+(5)	10.2	2.55	5.11
Cadmium	0.274J R22	0.511	0.0582	0.102
Calcium	7590	102	17.4	20.4
Chromium	11.1	0.511	0.0511	0.102
Cobalt	7.29	0.511	0.0511	0.102
Copper	20.5	0.511	0.102	0.204
Iron	17500	102	5.11	10.2
Lead	6.25	0.511	0.0511	0.102
Magnesium	6230	102	10.2	20.4
Manganese	188	0.511	0.156	0.204
Molybdenum	0.630	0.511	0.102	0.204
Nickel	6.91	0.511	0.0643	0.102
Potassium	3380	102	10.2	20.4
Selenium	ND	0.511	0.0511	0.102
Silver	ND	0.511	0.0511	0.102
Sodium	2210	102	10.2	20.4
Thallium	0.136J	0.511	0.0511	0.102
Vanadium	49.2	0.511	0.194	0.255
Zinc	34.2	2.04	0.697	1.02

4/7/16 8

7016

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-005	Date Analyzed:	03/28/16 16:01
Lab Samp ID:	C070-05	Dilution Factor:	0.966
Lab File ID:	98C11054	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	2.7
Calib. Ref.:	98C11050	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	7320	99.3	9.93	19.9
Antimony	0.116J	0.496	0.0993	0.199
Arsenic	2.64	0.496	0.0496	0.0993
Barium	68.4	0.496	0.0715	0.0993
Beryllium	0.323J	0.496	0.0496	0.0993
Boron	6.80J U(6)	9.93	2.48	4.96
Cadmium	0.139J	0.496	0.0566	0.0993
Calcium	4790	99.3	16.9	19.9
Chromium	6.91	0.496	0.0496	0.0993
Cobalt	4.41	0.496	0.0496	0.0993
Copper	13.4	0.496	0.0993	0.199
Iron	14000	99.3	4.96	9.93
Lead	3.28	0.496	0.0496	0.0993
Magnesium	2860	99.3	9.93	19.9
Manganese	161	0.496	0.152	0.199
Molybdenum	0.168J	0.496	0.0993	0.199
Nickel	4.47	0.496	0.0625	0.0993
Potassium	2240	99.3	9.93	19.9
Selenium	0.0595J 0.0993	0.496 (T)	0.0496	0.0993
Silver	0.0514J	0.496	0.0496	0.0993
Sodium	221	99.3	9.93	19.9
Thallium	0.0880J	0.496	0.0496	0.0993
Vanadium	32.9	0.496	0.189	0.248
Zinc	20.9	1.99	0.678	0.993

5/17/16 Q

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-006	Date Analyzed:	03/28/16 16:06
Lab Samp ID:	C070-06	Dilution Factor:	0.98
Lab File ID:	98C11055	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	2.2
Calib. Ref.:	98C11050	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	6770	100	10.0	20.0
Antimony	0.116J	0.501	0.100	0.200
Arsenic	2.74	0.501	0.0501	0.100
Barium	73.1	0.501	0.0721	0.100
Beryllium	0.236J	0.501	0.0501	0.100
Boron	4.94J 5.1U	10.0 (16)	2.51	5.01
Cadmium	0.115J	0.501	0.0571	0.100
Calcium	6160	100	17.0	20.0
Chromium	7.83	0.501	0.0501	0.100
Cobalt	5.25	0.501	0.0501	0.100
Copper	13.4	0.501	0.100	0.200
Iron	15200	100	5.01	10.0
Lead	2.78	0.501	0.0501	0.100
Magnesium	2900	100	10.0	20.0
Manganese	220	0.501	0.153	0.200
Molybdenum	0.198J	0.501	0.100	0.200
Nickel	4.57	0.501	0.0631	0.100
Potassium	2280	100	10.0	20.0
Selenium	ND	0.501	0.0501	0.100
Silver	ND	0.501	0.0501	0.100
Sodium	199	100	10.0	20.0
Thallium	0.0811J	0.501	0.0501	0.100
Vanadium	37.6	0.501	0.190	0.251
Zinc	20.7	2.00	0.684	1.00

4/7/16 8

METHOD SW6020A
METALS BY ICP-MS

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
SDG NO. : 16C070	Date Extracted: 03/17/16 15:19
Sample ID: KCH067-007	Date Analyzed: 03/28/16 16:10
Lab Samp ID: C070-07	Dilution Factor: 0.962
Lab File ID: 98C11056	Matrix : SOIL
Ext Btch ID: IMC031S	% Moisture : 1.9
Calib. Ref.: 98C11050	Instrument ID : T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	4640	98.1	9.81	19.6
Antimony	ND	0.490	0.0981	0.196
Arsenic	1.77	0.490	0.0490	0.0981
Barium	66.6	0.490	0.0706	0.0981
Beryllium	0.169J	0.490	0.0490	0.0981
Boron	4.62J 4.90U	9.81 (6)	2.45	4.90
Cadmium	0.0987J	0.490	0.0559	0.0981
Calcium	3570	98.1	16.7	19.6
Chromium	4.75	0.490	0.0490	0.0981
Cobalt	3.12	0.490	0.0490	0.0981
Copper	8.52	0.490	0.0981	0.196
Iron	10600	98.1	4.90	9.81
Lead	2.06	0.490	0.0490	0.0981
Magnesium	2240	98.1	9.81	19.6
Manganese	118	0.490	0.150	0.196
Molybdenum	0.142J	0.490	0.0981	0.196
Nickel	2.84	0.490	0.0618	0.0981
Potassium	1700	98.1	9.81	19.6
Selenium	ND	0.490	0.0490	0.0981
Silver	ND	0.490	0.0490	0.0981
Sodium	115	98.1	9.81	19.6
Thallium	0.0589J	0.490	0.0490	0.0981
Vanadium	23.6	0.490	0.186	0.245
Zinc	15.7	1.96	0.670	0.981

5/17/16

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-008	Date Analyzed:	03/28/16 16:15
Lab Samp ID:	C070-08	Dilution Factor:	0.98
Lab File ID:	98C11057	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	1.5
Calib. Ref.:	98C11050	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	3920	99.5	9.95	19.9
Antimony	ND	0.497	0.0995	0.199
Arsenic	1.83	0.497	0.0497	0.0995
Barium	41.8	0.497	0.0716	0.0995
Beryllium	0.162J	0.497	0.0497	0.0995
Boron	4.50J 4.9TU	9.95 (6)	2.49	4.97
Cadmium	0.0907J	0.497	0.0567	0.0995
Calcium	2470	99.5	16.9	19.9
Chromium	5.20	0.497	0.0497	0.0995
Cobalt	2.63	0.497	0.0497	0.0995
Copper	6.78	0.497	0.0995	0.199
Iron	10800	99.5	4.97	9.95
Lead	1.99	0.497	0.0497	0.0995
Magnesium	1730	99.5	9.95	19.9
Manganese	85.7	0.497	0.152	0.199
Molybdenum	0.146J	0.497	0.0995	0.199
Nickel	2.60	0.497	0.0627	0.0995
Potassium	1290	99.5	9.95	19.9
Selenium	ND	0.497	0.0497	0.0995
Silver	ND	0.497	0.0497	0.0995
Sodium	281	99.5	9.95	19.9
Thallium	ND	0.497	0.0497	0.0995
Vanadium	25.2	0.497	0.189	0.249
Zinc	11.6	1.99	0.680	0.995

4/7/16 8

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-009	Date Analyzed:	03/28/16 16:19
Lab Samp ID:	C070-09	Dilution Factor:	0.985
Lab File ID:	98C11058	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	2.9
Calib. Ref.:	98C11050	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)		LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	8380		101	10.1	20.3
Antimony	1.70		0.507	0.101	0.203
Arsenic	2.98		0.507	0.0507	0.101
Barium	90.0		0.507	0.0730	0.101
Beryllium	0.267J		0.507	0.0507	0.101
Boron	31.5E	R22	10.1	2.54	5.07
Cadmium	4.68		0.507	0.0578	0.101
Calcium	3860		101	17.2	20.3
Chromium	19.9		0.507	0.0507	0.101
Cobalt	5.83		0.507	0.0507	0.101
Copper	60.4		0.507	0.101	0.203
Iron	19500		101	5.07	10.1
Lead	64.5		0.507	0.0507	0.101
Magnesium	3110		101	10.1	20.3
Manganese	237		0.507	0.155	0.203
Molybdenum	1.64		0.507	0.101	0.203
Nickel	18.2		0.507	0.0639	0.101
Potassium	2380		101	10.1	20.3
Selenium	ND		0.507	0.0507	0.101
Silver	2.39		0.507	0.0507	0.101
Sodium	187		101	10.1	20.3
Thallium	0.0875J		0.507	0.0507	0.101
Vanadium	34.6		0.507	0.193	0.254
Zinc	242		2.03	0.693	1.01

4/17/16 8

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-009RE	Date Analyzed:	03/29/16 14:58
Lab Samp ID:	C070-09N	Dilution Factor:	0.985
Lab File ID:	98C12025	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	2.9
Calib. Ref.:	98C12016	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	8400 R22	101	10.1	20.3
Antimony	1.67	0.507	0.101	0.203
Arsenic	2.99	0.507	0.0507	0.101
Barium	85.0	0.507	0.0730	0.101
Beryllium	0.256J	0.507	0.0507	0.101
Boron	30.3 J+(S)	10.1	2.54	5.07
Cadmium	4.35 R22	0.507	0.0578	0.101
Calcium	3920	101	17.2	20.3
Chromium	19.8	0.507	0.0507	0.101
Cobalt	5.94	0.507	0.0507	0.101
Copper	61.4	0.507	0.101	0.203
Iron	18600	101	5.07	10.1
Lead	64.8	0.507	0.0507	0.101
Magnesium	3290	101	10.1	20.3
Manganese	235	0.507	0.155	0.203
Molybdenum	1.66	0.507	0.101	0.203
Nickel	18.6	0.507	0.0639	0.101
Potassium	2370	101	10.1	20.3
Selenium	ND	0.507	0.0507	0.101
Silver	2.41	0.507	0.0507	0.101
Sodium	204	101	10.1	20.3
Thallium	0.0880J	0.507	0.0507	0.101
Vanadium	34.6	0.507	0.193	0.254
Zinc	248	2.03	0.693	1.01

4/17/16 ✓

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-010	Date Analyzed:	03/28/16 16:25
Lab Samp ID:	C070-10	Dilution Factor:	0.98
Lab File ID:	98C11059	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	3.8
Calib. Ref.:	98C11050	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	7500	102	10.2	20.4
Antimony	0.178J	0.509	0.102	0.204
Arsenic	1.72	0.509	0.0509	0.102
Barium	105	0.509	0.0733	0.102
Beryllium	0.250J	0.509	0.0509	0.102
Boron	9.71J U(16)	10.2	2.55	5.09
Cadmium	0.284J	0.509	0.0581	0.102
Calcium	3020E R2	102	17.3	20.4
Chromium	8.10	0.509	0.0509	0.102
Cobalt	6.07	0.509	0.0509	0.102
Copper	17.5	0.509	0.102	0.204
Iron	15800E R2	102	5.09	10.2
Lead	4.12	0.509	0.0509	0.102
Magnesium	3730	102	10.2	20.4
Manganese	251	0.509	0.156	0.204
Molybdenum	0.323J	0.509	0.102	0.204
Nickel	5.31	0.509	0.0642	0.102
Potassium	2790	102	10.2	20.4
Selenium	ND	0.509	0.0509	0.102
Silver	0.0746J	0.509	0.0509	0.102
Sodium	200E R2	102	10.2	20.4
Thallium	0.0999J	0.509	0.0509	0.102
Vanadium	36.7	0.509	0.194	0.255
Zinc	35.2	2.04	0.696	1.02

4/17/16 [illegible]

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-010RE	Date Analyzed:	03/28/16 18:11
Lab Samp ID:	C070-10N	Dilution Factor:	0.98
Lab File ID:	98C11083	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	3.8
Calib. Ref.:	98C11074	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	7510	102	10.2	20.4
Antimony	0.178J	0.509	0.102	0.204
Arsenic	1.73	0.509	0.0509	0.102
Barium	107	0.509	0.0733	0.102
Beryllium	0.240J	0.509	0.0509	0.102
Boron	9.62J	10.2	2.55	5.09
Cadmium	0.307J	0.509	0.0581	0.102
Calcium	2990	102	17.3	20.4
Chromium	8.15	0.509	0.0509	0.102
Cobalt	6.07	0.509	0.0509	0.102
Copper	17.6	0.509	0.102	0.204
Iron	16200	102	5.09	10.2
Lead	4.12	0.509	0.0509	0.102
Magnesium	3670	102	10.2	20.4
Manganese	254	0.509	0.156	0.204
Molybdenum	0.327J	0.509	0.102	0.204
Nickel	5.33	0.509	0.0642	0.102
Potassium	2790	102	10.2	20.4
Selenium	ND	0.509	0.0509	0.102
Silver	0.0746J	0.509	0.0509	0.102
Sodium	197	102	10.2	20.4
Thallium	0.0981J	0.509	0.0509	0.102
Vanadium	36.6	0.509	0.194	0.255
Zinc	34.6	2.04	0.696	1.02

4/7/16 [illegible]

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-011	Date Analyzed:	03/28/16 16:29
Lab Samp ID:	C070-11	Dilution Factor:	0.976
Lab File ID:	98C11060	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	3.1
Calib. Ref.:	98C11050	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	9370	101	10.1	20.1
Antimony	2.56	0.504	0.101	0.201
Arsenic	2.72	0.504	0.0504	0.101
Barium	83.2	0.504	0.0725	0.101
Beryllium	0.273J	0.504	0.0504	0.101
Boron	46.4E R2	10.1	2.52	5.04
Cadmium	9.34	0.504	0.0574	0.101
Calcium	3830	101	17.1	20.1
Chromium	22.5	0.504	0.0504	0.101
Cobalt	5.71	0.504	0.0504	0.101
Copper	99.7	0.504	0.101	0.201
Iron	22100	101	5.04	10.1
Lead	140	0.504	0.0504	0.101
Magnesium	2750	101	10.1	20.1
Manganese	245	0.504	0.154	0.201
Molybdenum	2.12	0.504	0.101	0.201
Nickel	22.5	0.504	0.0635	0.101
Potassium	2220	101	10.1	20.1
Selenium	ND	0.504	0.0504	0.101
Silver	4.05	0.504	0.0504	0.101
Sodium	283	101	10.1	20.1
Thallium	0.0779J	0.504	0.0504	0.101
Vanadium	35.8	0.504	0.191	0.252
Zinc	413E R2	2.01	0.688	1.01

4/17/16 8

METHOD SW6020A
METALS BY ICP-MS

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
SDG NO. : 16C070	Date Extracted: 03/17/16 15:19
Sample ID: KCH067-011DL	Date Analyzed: 03/29/16 15:03
Lab Samp ID: C070-11I	Dilution Factor: 1.95
Lab File ID: 98C12026	Matrix : SOIL
Ext Btch ID: IMC031S	% Moisture : 3.1
Calib. Ref.: 98C12016	Instrument ID : T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	9390	201	20.1	40.2
Antimony	2.63	1.01	0.201	0.402
Arsenic	2.84	1.01	0.101	0.201
Barium	83.1	1.01	0.145	0.201
Beryllium	0.292J	1.01	0.101	0.201
Boron	47.2	20.1	5.03	10.1
Cadmium	8.61	1.01	0.115	0.201
Calcium	3940	201	34.2	40.2
Chromium	23.4	1.01	0.101	0.201
Cobalt	6.02	1.01	0.101	0.201
Copper	106	1.01	0.201	0.402
Iron	21200	201	10.1	20.1
Lead	143	1.01	0.101	0.201
Magnesium	2940	201	20.1	40.2
Manganese	248	1.01	0.308	0.402
Molybdenum	2.09	1.01	0.201	0.402
Nickel	22.9	1.01	0.127	0.201
Potassium	2250	201	20.1	40.2
Selenium	ND	1.01	0.101	0.201
Silver	4.18	1.01	0.101	0.201
Sodium	310	201	20.1	40.2
Thallium	ND	1.01	0.101	0.201
Vanadium	36.6	1.01	0.382	0.503
Zinc	434	4.02	1.37	2.01

R22 J+(5) R22

4/17/16

METHOD SW6020A
METALS BY ICP-MS

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
SDG NO. : 16C070	Date Extracted: 03/17/16 15:19
Sample ID: KCH067-012	Date Analyzed: 03/28/16 16:47
Lab Samp ID: C070-12	Dilution Factor: 0.976
Lab File ID: 98C11064	Matrix : SOIL
Ext Btch ID: IMC031S	% Moisture : 3.5
Calib. Ref.: 98C11062	Instrument ID : T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	6440	101	10.1	20.2
Antimony	0.183J	0.506	0.101	0.202
Arsenic	2.43	0.506	0.0506	0.101
Barium	73.7	0.506	0.0728	0.101
Beryllium	0.253J	0.506	0.0506	0.101
Boron	14.4	10.1	2.53	5.06
Cadmium	0.190J	0.506	0.0576	0.101
Calcium	4550	101	17.2	20.2
Chromium	6.27	0.506	0.0506	0.101
Cobalt	4.19	0.506	0.0506	0.101
Copper	11.7	0.506	0.101	0.202
Iron	12100	101	5.06	10.1
Lead	5.93	0.506	0.0506	0.101
Magnesium	2590	101	10.1	20.2
Manganese	161	0.506	0.155	0.202
Molybdenum	0.235J	0.506	0.101	0.202
Nickel	3.71	0.506	0.0637	0.101
Potassium	1980	101	10.1	20.2
Selenium	ND	0.506	0.0506	0.101
Silver	ND	0.506	0.0506	0.101
Sodium	389	101	10.1	20.2
Thallium	0.0855J	0.506	0.0506	0.101
Vanadium	28.1	0.506	0.192	0.253
Zinc	37.9	2.02	0.691	1.01

METHOD SW6020A
METALS BY ICP-MS

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
SDG NO. : 16C070	Date Extracted: 03/17/16 15:19
Sample ID: KCH067-013	Date Analyzed: 03/28/16 16:52
Lab Samp ID: C070-13	Dilution Factor: 0.966
Lab File ID: 98C11065	Matrix : SOIL
Ext Btch ID: IMC031S	% Moisture : 5.0
Calib. Ref.: 98C11062	Instrument ID : T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	8330	102	10.2	20.3
Antimony	0.130J	0.508	0.102	0.203
Arsenic	2.17	0.508	0.0508	0.102
Barium	145	0.508	0.0732	0.102
Beryllium	0.261J	0.508	0.0508	0.102
Boron	8.91J ~~B~~ U	10.2 (6)	2.54	5.08
Cadmium	0.110J	0.508	0.0580	0.102
Calcium	5060	102	17.3	20.3
Chromium	9.72	0.508	0.0508	0.102
Cobalt	7.44	0.508	0.0508	0.102
Copper	21.6	0.508	0.102	0.203
Iron	17900	102	5.08	10.2
Lead	3.22	0.508	0.0508	0.102
Magnesium	4360	102	10.2	20.3
Manganese	249	0.508	0.156	0.203
Molybdenum	0.280J	0.508	0.102	0.203
Nickel	5.84	0.508	0.0641	0.102
Potassium	3270	102	10.2	20.3
Selenium	0.0983J	0.508	0.0508	0.102
Silver	ND	0.508	0.0508	0.102
Sodium	471	102	10.2	20.3
Thallium	0.118J	0.508	0.0508	0.102
Vanadium	41.3	0.508	0.193	0.254
Zinc	30.6	2.03	0.695	1.02

4/05/16

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-014	Date Analyzed:	03/28/16 16:56
Lab Samp ID:	C070-14	Dilution Factor:	0.966
Lab File ID:	98C11066	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	3.9
Calib. Ref.:	98C11062	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	7700	101	10.1	20.1
Antimony	0.133J	0.503	0.101	0.201
Arsenic	2.21	0.503	0.0503	0.101
Barium	174	0.503	0.0724	0.101
Beryllium	0.245J	0.503	0.0503	0.101
Boron	9.15J	10.1 (6)	2.51	5.03
Cadmium	0.123J	0.503	0.0573	0.101
Calcium	3510	101	17.1	20.1
Chromium	9.22	0.503	0.0503	0.101
Cobalt	5.79	0.503	0.0503	0.101
Copper	16.2	0.503	0.101	0.201
Iron	16400	101	5.03	10.1
Lead	3.64	0.503	0.0503	0.101
Magnesium	3610	101	10.1	20.1
Manganese	242	0.503	0.154	0.201
Molybdenum	0.243J	0.503	0.101	0.201
Nickel	5.39	0.503	0.0633	0.101
Potassium	2830	101	10.1	20.1
Selenium	0.0511J	0.503	0.0503	0.101
Silver	ND	0.503	0.0503	0.101
Sodium	325	101	10.1	20.1
Thallium	0.106J	0.503	0.0503	0.101
Vanadium	39.3	0.503	0.191	0.251
Zinc	30.1	2.01	0.687	1.01

3/31/16

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-015	Date Analyzed:	03/28/16 17:01
Lab Samp ID:	C070-15	Dilution Factor:	0.976
Lab File ID:	98C11067	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	3.6
Calib. Ref.:	98C11062	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	7330	101	10.1	20.2
Antimony	0.108J	0.506	0.101	0.202
Arsenic	2.73	0.506	0.0506	0.101
Barium	80.3	0.506	0.0729	0.101
Beryllium	0.293J	0.506	0.0506	0.101
Boron	14.4	10.1	2.53	5.06
Cadmium	0.131J	0.506	0.0577	0.101
Calcium	4890	101	17.2	20.2
Chromium	8.32	0.506	0.0506	0.101
Cobalt	4.72	0.506	0.0506	0.101
Copper	15.3	0.506	0.101	0.202
Iron	15400	101	5.06	10.1
Lead	2.94	0.506	0.0506	0.101
Magnesium	3110	101	10.1	20.2
Manganese	180	0.506	0.155	0.202
Molybdenum	0.337J	0.506	0.101	0.202
Nickel	5.32	0.506	0.0638	0.101
Potassium	2470	101	10.1	20.2
Selenium	0.0596J	0.506	0.0506	0.101
Silver	ND	0.506	0.0506	0.101
Sodium	491	101	10.1	20.2
Thallium	0.0930J	0.506	0.0506	0.101
Vanadium	33.2	0.506	0.192	0.253
Zinc	23.9	2.02	0.692	1.01

SG 5/7/16

METHOD SW6020A
METALS BY ICP-MS

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
SDG NO. : 16C070	Date Extracted: 03/17/16 15:19
Sample ID: KCH067-016	Date Analyzed: 03/28/16 17:18
Lab Samp ID: C070-16	Dilution Factor: 0.962
Lab File ID: 98C11071	Matrix : SOIL
Ext Btch ID: IMC031S	% Moisture : 2.8
Calib. Ref.: 98C11062	Instrument ID : T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	7220	99.0	9.90	19.8
Antimony	0.112J J-(8)	0.495	0.0990	0.198
Arsenic	2.48	0.495	0.0495	0.0990
Barium	111	0.495	0.0713	0.0990
Beryllium	0.224J	0.495	0.0495	0.0990
Boron	7.59EJ R-22	9.90	2.47	4.95
Cadmium	0.117J	0.495	0.0564	0.0990
Calcium	5050 J-(8)	99.0	16.8	19.8
Chromium	7.31 J-(8)	0.495	0.0495	0.0990
Cobalt	5.65	0.495	0.0495	0.0990
Copper	16.0 J-(8)	0.495	0.0990	0.198
Iron	15400	99.0	4.95	9.90
Lead	2.39	0.495	0.0495	0.0990
Magnesium	3820 J-(8)	99.0	9.90	19.8
Manganese	221	0.495	0.151	0.198
Molybdenum	0.247J	0.495	0.0990	0.198
Nickel	5.01	0.495	0.0624	0.0990
Potassium	2840 J-(8)	99.0	9.90	19.8
Selenium	ND	0.495	0.0495	0.0990
Silver	ND	0.495	0.0495	0.0990
Sodium	384	99.0	9.90	19.8
Thallium	0.100J	0.495	0.0495	0.0990
Vanadium	36.8 J-(8)	0.495	0.188	0.247
Zinc	23.7	1.98	0.676	0.990

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-016RE	Date Analyzed:	03/29/16 15:33
Lab Samp ID:	C070-16N	Dilution Factor:	0.962
Lab File ID:	98C12033	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	2.8
Calib. Ref.:	98C12028	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)		LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	7050	R2	99.0	9.90	19.8
Antimony	0.110J		0.495	0.0990	0.198
Arsenic	2.51		0.495	0.0495	0.0990
Barium	105		0.495	0.0713	0.0990
Beryllium	0.227J		0.495	0.0495	0.0990
Boron	7.20J	UJ	9.90 (5,6)	2.47	4.95
Cadmium	0.110J	R2	0.495	0.0564	0.0990
Calcium	5020		99.0	16.8	19.8
Chromium	7.33		0.495	0.0495	0.0990
Cobalt	5.68		0.495	0.0495	0.0990
Copper	16.3		0.495	0.0990	0.198
Iron	14500		99.0	4.95	9.90
Lead	2.46		0.495	0.0495	0.0990
Magnesium	3950		99.0	9.90	19.8
Manganese	214		0.495	0.151	0.198
Molybdenum	0.244J		0.495	0.0990	0.198
Nickel	4.87		0.495	0.0624	0.0990
Potassium	2820		99.0	9.90	19.8
Selenium	ND		0.495	0.0495	0.0990
Silver	ND		0.495	0.0495	0.0990
Sodium	402		99.0	9.90	19.8
Thallium	0.109J		0.495	0.0495	0.0990
Vanadium	36.6		0.495	0.188	0.247
Zinc	24.2		1.98	0.676	0.990

4/17/16

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-017	Date Analyzed:	03/28/16 17:40
Lab Samp ID:	C070-17	Dilution Factor:	0.985
Lab File ID:	98C11076	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	0.0
Calib. Ref.:	98C11074	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	7350	98.5	9.85	19.7
Antimony	0.142J	0.493	0.0985	0.197
Arsenic	3.34	0.493	0.0493	0.0985
Barium	99.4	0.493	0.0709	0.0985
Beryllium	0.286J	0.493	0.0493	0.0985
Boron	9.94	9.85	2.46	4.93
Cadmium	0.201J	0.493	0.0561	0.0985
Calcium	7640	98.5	16.7	19.7
Chromium	7.30	0.493	0.0493	0.0985
Cobalt	5.17	0.493	0.0493	0.0985
Copper	16.7	0.493	0.0985	0.197
Iron	14300	98.5	4.93	9.85
Lead	9.97	0.493	0.0493	0.0985
Magnesium	3530	98.5	9.85	19.7
Manganese	220	0.493	0.151	0.197
Molybdenum	0.339J	0.493	0.0985	0.197
Nickel	6.22	0.493	0.0621	0.0985
Potassium	2620	98.5	9.85	19.7
Selenium	0.0584J	0.493	0.0493	0.0985
Silver	ND	0.493	0.0493	0.0985
Sodium	250	98.5	9.85	19.7
Thallium	0.102J	0.493	0.0493	0.0985
Vanadium	27.4	0.493	0.187	0.246
Zinc	69.7	1.97	0.673	0.985

4/25/16

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C070	Date Extracted:	03/17/16 15:19
Sample ID:	KCH067-018	Date Analyzed:	03/28/16 17:45
Lab Samp ID:	C070-18	Dilution Factor:	0.976
Lab File ID:	98C11077	Matrix :	SOIL
Ext Btch ID:	IMC031S	% Moisture :	2.1
Calib. Ref.:	98C11074	Instrument ID :	I-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	7500	99.7	9.97	19.9
Antimony	0.132J	0.498	0.0997	0.199
Arsenic	2.48	0.498	0.0498	0.0997
Barium	115	0.498	0.0718	0.0997
Beryllium	0.236J	0.498	0.0498	0.0997
Boron	9.82J ~~1.17U~~	9.97 (6)	2.49	4.98
Cadmium	0.121J	0.498	0.0568	0.0997
Calcium	6990	99.7	16.9	19.9
Chromium	8.61	0.498	0.0498	0.0997
Cobalt	5.91	0.498	0.0498	0.0997
Copper	15.9	0.498	0.0997	0.199
Iron	14200	99.7	4.98	9.97
Lead	2.97	0.498	0.0498	0.0997
Magnesium	3650	99.7	9.97	19.9
Manganese	240	0.498	0.153	0.199
Molybdenum	0.425J	0.498	0.0997	0.199
Nickel	5.78	0.498	0.0628	0.0997
Potassium	2870	99.7	9.97	19.9
Selenium	0.0528J	0.498	0.0498	0.0997
Silver	ND	0.498	0.0498	0.0997
Sodium	434	99.7	9.97	19.9
Thallium	0.107J	0.498	0.0498	0.0997
Vanadium	32.5	0.498	0.189	0.249
Zinc	27.4	1.99	0.681	0.997

8/25/16

METHOD SW7471A
MERCURY BY COLD VAPOR

Client : KLEINFELDER
Project : NAWS CHINA LAKE, CTO 067
Batch No. : 16C070

Matrix : SOIL
InstrumentID : 47

CLIENT SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/kg)	DIL'N FACTOR	MOIST (%)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1S	HGC017SB	ND	1	NA	0.10	0.010	0.020	03/25/1611:12	03/24/1618:05	M47C013011	M47C013	HGC017S	NA	NA
LCS1S	HGC017SL	0.424	1	NA	0.10	0.010	0.020	03/25/1611:14	03/24/1618:05	M47C013012	M47C013	HGC017S	NA	NA
LCD1S	HGC017SC	0.418	1	NA	0.10	0.010	0.020	03/25/1611:16	03/24/1618:05	M47C013013	M47C013	HGC017S	NA	NA
KCH067-003	C070-03	ND	1	6.9	0.11	0.011	0.021	03/25/1611:21	03/24/1618:05	M47C013015	M47C013	HGC017S	03/08/1609:40	03/10/16
KCH067-003MS	C070-03M	0.466	1	6.9	0.11	0.011	0.021	03/25/1611:25	03/24/1618:05	M47C013017	M47C013	HGC017S	03/08/1609:40	03/10/16
KCH067-003MSD	C070-03S	0.466	1	6.9	0.11	0.011	0.021	03/25/1611:28	03/24/1618:05	M47C013018	M47C013	HGC017S	03/08/1609:40	03/10/16
KCH067-016	C070-16	ND	1	2.8	0.10	0.010	0.020	03/25/1611:32	03/24/1618:05	M47C013020	M47C013	HGC017S	03/08/1615:00	03/10/16
KCH067-016MS	C070-16M	0.445	1	2.8	0.10	0.010	0.020	03/25/1611:40	03/24/1618:05	M47C013024	M47C013	HGC017S	03/08/1615:00	03/10/16
KCH067-016MSD	C070-16S	0.445	1	2.8	0.10	0.010	0.020	03/25/1611:43	03/24/1618:05	M47C013025	M47C013	HGC017S	03/08/1615:00	03/10/16
KCH067-001	C070-01	ND	1	4.3	0.10	0.010	0.021	03/25/1611:45	03/24/1618:05	M47C013026	M47C013	HGC017S	03/08/1609:15	03/10/16
KCH067-002	C070-02	ND	1	9.0	0.11	0.011	0.022	03/25/1611:47	03/24/1618:05	M47C013027	M47C013	HGC017S	03/08/1609:30	03/10/16
KCH067-004	C070-04	ND	1	4.9	0.10	0.010	0.021	03/25/1611:49	03/24/1618:05	M47C013028	M47C013	HGC017S	03/08/1609:55	03/10/16
KCH067-005	C070-05	ND	1	2.7	0.10	0.010	0.020	03/25/1611:51	03/24/1618:05	M47C013029	M47C013	HGC017S	03/08/1613:25	03/10/16
KCH067-006	C070-06	ND	1	2.2	0.10	0.010	0.020	03/25/1611:53	03/24/1618:05	M47C013030	M47C013	HGC017S	03/08/1613:40	03/10/16
KCH067-007	C070-07	ND	1	1.9	0.10	0.010	0.020	03/25/1611:55	03/24/1618:05	M47C013031	M47C013	HGC017S	03/08/1613:45	03/10/16
KCH067-008	C070-08	ND	1	1.5	0.099	0.0099	0.020	03/25/1611:58	03/24/1618:05	M47C013032	M47C013	HGC017S	03/08/1613:55	03/10/16
KCH067-009	C070-09	ND	1	2.9	0.10	0.010	0.020	03/25/1612:04	03/24/1618:05	M47C013035	M47C013	HGC017S	03/08/1614:00	03/10/16
KCH067-010	C070-10	ND	1	3.8	0.10	0.010	0.020	03/25/1612:06	03/24/1618:05	M47C013036	M47C013	HGC017S	03/08/1614:05	03/10/16
KCH067-011	C070-11	ND	1	3.1	0.10	0.010	0.020	03/25/1612:08	03/24/1618:05	M47C013037	M47C013	HGC017S	03/08/1614:10	03/10/16
KCH067-012	C070-12	ND	1	3.5	0.10	0.010	0.020	03/25/1612:11	03/24/1618:05	M47C013038	M47C013	HGC017S	03/08/1614:20	03/10/16
KCH067-013	C070-13	ND	1	5.0	0.10	0.010	0.021	03/25/1612:13	03/24/1618:05	M47C013039	M47C013	HGC017S	03/08/1614:25	03/10/16
KCH067-014	C070-14	ND	1	3.9	0.10	0.010	0.020	03/25/1612:15	03/24/1618:05	M47C013040	M47C013	HGC017S	03/08/1614:30	03/10/16
KCH067-015	C070-15	ND	1	3.6	0.10	0.010	0.020	03/25/1612:18	03/24/1618:05	M47C013041	M47C013	HGC017S	03/08/1614:50	03/10/16
KCH067-017	C070-17	ND	1	0.0	0.10	0.010	0.020	03/25/1612:20	03/24/1618:05	M47C013042	M47C013	HGC017S	03/08/1615:20	03/10/16
KCH067-018	C070-18	ND	1	2.1	0.10	0.010	0.020	03/25/1612:22	03/24/1618:05	M47C013043	M47C013	HGC017S	03/08/1615:30	03/10/16

7188

ス 05/17/16

LDC #: 36282A4a

SDG #: 16C070

Laboratory: EMAX Laboratories Inc.

VALIDATION COMPLETENESS WORKSHEET

Standard/Full

Date: 5/9/16

Page: 1 of 2

Reviewer: JO

2nd Reviewer: A

METHOD: Metals (EPA SW 846 Method 6020A/7470A) 1 30

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	3/8/16
II.	ICP/MS Tune	A	
III.	Instrument Calibration	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB= KCH067-019 (SDG: 16C074)
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS/D = (19.20) (21.22)
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS/D
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	A	Not reviewed for Standard Validation
XIII.	Sample Result Verification 30	SW A	Not reviewed for Standard validation.
XIV.	Overall Assessment of Data ↓	SW A	

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

** Indicates sample underwent Full validation

	Client ID	Lab ID	Matrix	Date
1	KCH067-001	16C070-01	Soil	03/08/16
2	KCH067-002	16C070-02	Soil	03/08/16
3	KCH067-003	16C070-03	Soil	03/08/16
4	KCH067-004**	16C070-04**	Soil	03/08/16
5	KCH067-005	16C070-05	Soil	03/08/16
6	KCH067-006	16C070-06	Soil	03/08/16
7	KCH067-007	16C070-07	Soil	03/08/16
8	KCH067-008	16C070-08	Soil	03/08/16
9	KCH067-009	16C070-09	Soil	03/08/16
10	KCH067-010	16C070-10	Soil	03/08/16
11	KCH067-011	16C070-11	Soil	03/08/16
12	KCH067-012	16C070-12	Soil	03/08/16
13	KCH067-013	16C070-13	Soil	03/08/16
14	KCH067-014	16C070-14	Soil	03/08/16
15	KCH067-015	16C070-15	Soil	03/08/16

LDC #: 36282A4a

SDG #: 16C070

Laboratory: EMAX Laboratories Inc.

VALIDATION COMPLETENESS WORKSHEET

Standard/Full

Date: 5/9/16

Page: 2 of 2

Reviewer: 3D

2nd Reviewer: _____

METHOD: Metals (EPA SW 846 Method 6020A/7470A)

	Client ID	Lab ID	Matrix	Date
16	KCH067-016**	16C070-16**	Soil	03/08/16
17	KCH067-017	16C070-17	Soil	03/08/16
18	KCH067-018	16C070-18	Soil	03/08/16
19	KCH067-003MS	16C070-03MS	Soil	03/08/16
20	KCH067-003MSD	16C070-03MSD	Soil	03/08/16
21	KCH067-016MS	16C070-16MS	Soil	03/08/16
22	KCH067-016MSD	16C070-16MSD	Soil	03/08/16
23	#1DL			
24	#2DL			
25	#2RE			
26	#3DL			
27	#4RE			
28	#9RE			
29	#10RE			
30	#11DL			
31	#16RE			
32				
33				
34				
35				
36				
37				
38				
39				
40				

Notes: _____

LDC #: 36282A4a

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: AL

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

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?		✓		
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			

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

LDC #: 36282A4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

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

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-18	S	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
QC 19-22	S	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
23-31	S	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, ~~Hg~~, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___

Comments: Mercury by CVAA if performed

LDC #: 36282A4a

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: SD
2nd Reviewer: 9

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

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

Y N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
Y N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%)?

LEVEL IV ONLY:

Y N N/A Was a midrange cyanide standard distilled?
Y N N/A Are all correlation coefficients ≥0.995?
Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualification of Data
	03/29/16	CCV (14:19)	B	182	25-28, 30	J+det/P (det) (05)
	03/29/16	CCV (15:11)	B	187	25-28, 30-31	J+det/P (det) (05)
	03/29/16	CCV (16:00)	B	184	31	J+det/P (det) (05)

Comments:

LDC #: 36282A4a

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: JD
2nd Reviewer: [illegible]

METHOD: Metals (EPA SW 864 Method 6010/6020/7000) Soil preparation factor applied: 50X

Sample Concentration units, unless otherwise noted: mg/kg Associated Samples: 1-11 (07)

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	Sample Identification: 1	3	5							
Se			0.100		0.130/~~0.512~~ U	0.176/~~0.524~~ U	0.0595/~~0.496~~ 0.0993 U							

Sample Concentration units, unless otherwise noted: mg/kg Associated Samples: 25-28, 30 (07)

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	Sample Identification: 25	26								
Mo			0.238		~~0.817/2.68~~	2.92/~~5.24~~ U								

Sample Concentration units, unless otherwise noted: mg/kg Associated Samples: 31 (07)

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	Sample Identification: 31									
Mo			0.223		0.244/~~0.495~~									

Sample Concentration units, unless otherwise noted: mg/kg Associated Samples: 25-28, 30-31 (07)

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	Sample Identification: 26	27	31							
Sb			0.294		1.15/~~5.24~~ 2.10	0.350/~~0.511~~	0.110/~~0.495~~ 0.198 U							

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.

LDC #: 36282A4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

METHOD: Trace Metals (EPA Method 200.7/200.8)

Blank units: ug/L **Associated sample units:** mg/kg
Sampling date: 03/08/16 Soil factor applied 50X
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: All (06)

Analyte	Blank ID	Sample Identification											
[redacted]	KCH067-019 (SDG: 16C074)	Action Limit	5	6	7	8	10	13	14	16	18	24	
B	4.65		6.80/~~9.93~~	4.94/~~10.6~~	4.62/~~9.81~~	4.50/~~9.95~~	9.71/~~10.2~~	8.91/~~10.2~~	9.15/~~10.1~~	7.59/~~9.90~~	9.82/~~9.97~~	53.3/~~53.6~~	
Ca	135	67.5		5.01	4.90	4.97							
Fe	9.85												
Pb	0.225												
Mn	0.318												
Ni	0.161												
Na	42.6												

Analyte	Blank ID	Sample Identification											
[redacted]	KCH067-019 (SDG: 16C074)	Action Limit	29	31									
B	4.65		9.62/~~10.2~~	7.20/~~9.90~~									
Ca	135	67.5											
Fe	9.85												
Pb	0.225												
Mn	0.318												
Ni	0.161												
Na	42.6												

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

LDC #: 36282A4

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: SB
2nd Reviewer:

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

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

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

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

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

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications	Postspike (75-125)
	19/20	S	Sb	40 (72-124)	38 (72-124)		3, 26	J-/UJ/A (det) (08)	
			Cr	46 (83-119)	50 (83-119)			J-/UJ/A (det) (08)	
			Cu	68 (84-119)	67 (84-119)			J-/UJ/A (det) (08)	
			Pb	-48 (84-118)	-56 (84-118)			J-/UJ/A (det) (08)	104
			Na	75 (79-125)	71 (79-125)			J-/UJ/A (det) (08)	
	21/22	S	Sb	61 (72-124)	60 (72-124)		16, 31	J-/UJ/A (det) (08)	
			Ca	85 (86-118)				J-/UJ/A (det) (08)	
			Cr	83 (83-119)				J-/UJ/A (det) (08)	
			Cu	80 (84-119)	78 (84-119)			J-/UJ/A (det) (08)	
			Mg	56 (80-123)	67 (80-123)			J-/UJ/A (det) (08)	
			K	74 (85-119)	84 (85-119)			J-/UJ/A (det) (08)	
			V	36 (82-116)	41 (82-116)			J-/UJ/A (det) (08)	

Comments: 19/20: Al, B, Ca, Fe, Mg, Mn, Zn > 4X
21/22: Ba, Fe, Mn,

LDC #: 36282C4a

VALIDATION FINDINGS WORKSHEET
Sample Result Verification

Reviewer: JD
2nd Reviewer: 9

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

#	Sample ID	Analyte	Result (units)	RL (units)	Finding	Qualifications
	1	B			> Linear range	J/A (20)
	2	B, Ca, Fe, Na			> Linear range	J/A (20)
	25	Fe			> Linear range	J/A (20)
	3	B			> Linear range	J/A (20)
	9	B			> Linear range	J/A (20)
	10	Ca, Fe, Na			> Linear range	J/A (20)
	11	B, Zn			> Linear range	J/A (20)
	16	B			> Linear range	J/A (20)

Comments:

LDC #: 36282C4a

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: JD
2nd Reviewer: Q

METHOD: Trace Metals (EPA CLP SOW ILM02.1)

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

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		1	B (exceeds calibration range)	1	R/A (22)
		2	B, Ca, Fe, Na (exceeds calibration range)	2	R/A (22)
		25	Fe (exceeds calibration range)	25	R/A (22)
		3	B (exceeds calibration range)	3	R/A (22)
		9	B (exceeds calibration range)	9	R/A (22)
		10	Ca, Fe, Na (exceeds calibration range)	10	R/A (22)
		11	B, Zn (exceeds calibration range)	11	R/A (22)
		16	B (exceeds calibration range)	16	R/A (22)

LDC #: 36282C4a

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: 3D
2nd Reviewer: Q

METHOD: Trace Metals (EPA CLP SOW ILM02.1)

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

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable? All except... = 6020 only Do not include Hg

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		23	All Except B (Dilution not neccesary)	23	R/A (22)
		24	All Except Fe (Dilution not necessary)	24	R/A (22)
		25	All Except B, Ca, Na, (Reanalysis not necessary for other analytes except Fe exceeds calibration range)	25	R/A (22)
		26	All Except B (Dilution not necesary)	26	R/A (22)
		27	All Except B (Designated as more technically sound by lab)	27	R/A (22)
		28	All Except B (Reanalysis not necessary)	28	R/A (22)
		29	All Except Ca, Fe, Na (Reanalysis not necessary)	29	R/A (22)
		30	All Except B (Dilution not necessary)	30	R/A (22)

LDC #: 36282C4a

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: JD
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA CLP SOW ILM02.1)

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

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		31	All Except B (Reanalysis not necessary)	31	R/A (22)

Comments:

LDC #: 36282A4q

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: JD
2nd Reviewer: JC

METHOD: Trace Metals (See cover)

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

%R = Found x 100 / True

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

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV 12:43	ICP/MS (Initial calibration)	Co	296.5 ug/L	300 ug/L	99%R	99%R	Y
ICV 11:03	CVAA (Initial calibration)	Hg	2.05 ug/L	2 ug/L	103%R	103%R	↓
	ICP (Continuing calibration)						
CCV (5) 16:38	ICP/MS (Continuing calibration)	Cu	230.5 ug/L	250 ug/L	92%R	92%R	Y
CCV 11:34	CVAA (Contining calibration)	Hg	2.03 ug/L	2 ug/L	102%R	102%R	↓
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments: _____

LDC #: 36282A4a

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: JD
2nd Reviewer: JC

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

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

$\%R = \frac{Found}{True} \times 100$ Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

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

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

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

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB 13:05	ICP interference check	Cr	20.08 ug/L	20 ug/L	100%R	100%R	Y
LCS 11:14	Laboratory control sample	Hg	0.425 mg/kg	0.414 mg/kg	103%R	102%R	Y*
MS 17:05	Matrix spike	Se	(SSR-SR) 18.1 mg/kg	19.9 mg/kg	91%R	91%R	Y
MSD 17:09	Duplicate	Ag	18.92 mg/kg	18.73 mg/kg	1%RPD	1%RPD	↓
SER 17:23	ICP serial dilution	K	6095 ug/L	5744 ug/L	6%D	6%D	↓

Comments: *Rounding

LDC #: 36282A1q

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JD
2nd reviewer: AA

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

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

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

Detected analyte results for (4) Al were recalculated and verified using the following equation:

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

Prep factor ↓
Dil = 10x
RD = 17430 ug/L
FV = 100ml
In W = 2.06g
% solids = 0.951

Recalculation: $\frac{(17430\ ug/L)(100ml)(10)}{(2.06g)(0.951)} \times \frac{1mg}{1000ug} = 8900\ mg/kg$

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

#	Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
	4	Al	8900	8900	Y
	10	V	36.8	36.8	Y
	27	B	33.5	33.5	Y
	31	B	7.20	7.20	Y

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 12, 2016

Parameters: Hexavalent Chromium

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C070

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-001	16C070-01	Soil	03/08/16
KCH067-002	16C070-02	Soil	03/08/16
KCH067-003	16C070-03	Soil	03/08/16
KCH067-004**	16C070-04**	Soil	03/08/16
KCH067-005	16C070-05	Soil	03/08/16
KCH067-006	16C070-06	Soil	03/08/16
KCH067-007	16C070-07	Soil	03/08/16
KCH067-008	16C070-08	Soil	03/08/16
KCH067-009	16C070-09	Soil	03/08/16
KCH067-010	16C070-10	Soil	03/08/16
KCH067-011	16C070-11	Soil	03/08/16
KCH067-012	16C070-12	Soil	03/08/16
KCH067-013	16C070-13	Soil	03/08/16
KCH067-014	16C070-14	Soil	03/08/16
KCH067-015	16C070-15	Soil	03/08/16
KCH067-016**	16C070-16**	Soil	03/08/16
KCH067-017	16C070-17	Soil	03/08/16
KCH067-018	16C070-18	Soil	03/08/16
KCH067-003MS	16C070-03MS	Soil	03/08/16
KCH067-003MSD	16C070-03MSD	Soil	03/08/16
KCH067-003DUP	16C070-03DUP	Soil	03/08/16
KCH067-016MS	16C070-16MS	Soil	03/08/16
KCH067-016MSD	16C070-16MSD	Soil	03/08/16
KCH067-016DUP	16C070-16DUP	Soil	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7199

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-019 (from SDG 16C074) was identified as an equipment blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

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

VII. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Hexavalent Chromium - Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

METHOD SW7199
HEXAVALENT CHROMIUM

Client : KLEINFELDER
Project : NAWS CHINA LAKE, CTO 067
Batch No. : 16C070

Matrix : SOIL
InstrumentID : 59

CLIENT SAMPLE ID	EMAX SAMPLE ID	RESULTS (ug/kg)	DIL'N. FACTOR	MOIST (%)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1S	HCC002SB	ND	1	NA	100	13	40	03/18/1612:06	03/16/1614:01	IC19003	IC19001	HCC002S	NA	NA
LCS1S	CSC002SL	981	1	NA	100	13	40	03/18/1612:27	03/16/1614:01	IC19005	IC19001	HCC002S	NA	NA
KCH067-003	C070-03	1750	1	6.9	107	14	43	03/18/1613:08	03/16/1614:01	IC19009	IC19001	HCC002S	03/08/1609:40	03/10/16
KCH067-003DUP	C070-03D	1770	1	6.9	107	14	43	03/18/1613:29	03/16/1614:01	IC19011	IC19001	HCC002S	03/08/1609:40	03/10/16
KCH067-003MS	C070-03M	3840	1	6.9	107	14	43	03/18/1614:11	03/16/1614:01	IC19015	IC19013	HCC002S	03/08/1609:40	03/10/16
KCH067-003MSD	C070-03S	3730	1	6.9	107	14	43	03/18/1614:32	03/16/1614:01	IC19017	IC19013	HCC002S	03/08/1609:40	03/10/16
KCH067-001	C070-01	1780	1	4.3	104	13.6	41.8	03/18/1615:34	03/16/1614:01	IC19023	IC19013	HCC002S	03/08/1609:15	03/10/16
KCH067-002	C070-02	275	1	9.0	110	14.3	44	03/18/1616:25	03/16/1614:01	IC19027	IC19025	HCC002S	03/08/1609:30	03/10/16
KCH067-004	C070-04	424	1	4.9	105	13.7	42.1	03/18/1616:46	03/16/1614:01	IC19029	IC19025	HCC002S	03/08/1609:55	03/10/16
KCH067-005	C070-05	ND	1	2.7	103	13.4	41.1	03/18/1617:07	03/16/1614:01	IC19031	IC19025	HCC002S	03/08/1613:25	03/10/16
KCH067-006	C070-06	ND	1	2.2	102	13.3	40.9	03/18/1617:27	03/16/1614:01	IC19033	IC19025	HCC002S	03/08/1613:40	03/10/16
KCH067-007	C070-07	ND	1	1.9	102	13.3	40.8	03/18/1617:48	03/16/1614:01	IC19035	IC19025	HCC002S	03/08/1613:45	03/10/16
KCH067-008	C070-08	ND	1	1.5	102	13.2	40.6	03/18/1618:30	03/16/1614:01	IC19039	IC19037	HCC002S	03/08/1613:55	03/10/16
KCH067-009	C070-09	ND	1	2.9	103	13.4	41.2	03/18/1618:51	03/16/1614:01	IC19041	IC19037	HCC002S	03/08/1614:00	03/10/16
KCH067-010	C070-10	ND	1	3.8	104	13.5	41.6	03/18/1619:11	03/16/1614:01	IC19043	IC19037	HCC002S	03/08/1614:05	03/10/16
KCH067-011	C070-11	ND	1	3.1	103	13.4	41.3	03/18/1619:32	03/16/1614:01	IC19045	IC19037	HCC002S	03/08/1614:10	03/10/16
KCH067-012	C070-12	ND	1	3.5	104	13.5	41.5	03/18/1619:53	03/16/1614:01	IC19047	IC19037	HCC002S	03/08/1614:20	03/10/16
KCH067-013	C070-13	ND	1	5.0	105	13.7	42.1	03/18/1620:35	03/16/1614:01	IC19051	IC19049	HCC002S	03/08/1614:25	03/10/16
KCH067-014	C070-14	ND	1	3.9	104	13.5	41.6	03/18/1620:55	03/16/1614:01	IC19053	IC19049	HCC002S	03/08/1614:30	03/10/16
KCH067-015	C070-15	ND	1	3.6	104	13.5	41.5	03/18/1621:16	03/16/1614:01	IC19055	IC19049	HCC002S	03/08/1614:50	03/10/16
KCH067-017	C070-17	57.5J	1	0.0	100	13	40	03/18/1621:37	03/16/1614:01	IC19057	IC19049	HCC002S	03/08/1615:20	03/10/16
KCH067-018	C070-18	ND	1	2.1	102	13.3	40.9	03/18/1621:58	03/16/1614:01	IC19059	IC19049	HCC002S	03/08/1615:30	03/10/16
KCH067-016	C070-16	ND	1	2.8	103	13.4	41.2	03/18/1622:40	03/16/1614:01	IC19063	IC19061	HCC002S	03/08/1615:00	03/10/16
KCH067-016DUP	C070-16D	ND	1	2.8	103	13.4	41.2	03/18/1623:00	03/16/1614:01	IC19065	IC19061	HCC002S	03/08/1615:00	03/10/16
KCH067-016MS	C070-16M	1840	1	2.8	103	13.4	41.2	03/18/1623:21	03/16/1614:01	IC19067	IC19061	HCC002S	03/08/1615:00	03/10/16
KCH067-016MSD	C070-16S	1680	1	2.8	103	13.4	41.2	03/18/1623:42	03/16/1614:01	IC19069	IC19061	HCC002S	03/08/1615:00	03/10/16
KCH067-002R	C070-02R	127	1	9.0	110	14.3	44	03/22/1615:44	03/16/1614:01	IC22003	IC22001	HCC002S	03/08/1609:30	03/10/16

8/25/16

LDC #: 36282A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/8/16
SDG #: 16C070 Standard/Full Page: 1 of 2
Laboratory: EMAX Laboratories Inc. Reviewer: JD
2nd Reviewer: A

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7199)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	3/8/16
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	FB = KCH067-019 (SDG: 16C074)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D = (9,20) (22,23)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Sample result verification	A	Not reviewed for Standard validation.
XI	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-001	16C070-01	Soil	03/08/16
2	KCH067-002	16C070-02	Soil	03/08/16
3	KCH067-003	16C070-03	Soil	03/08/16
4	KCH067-004**	16C070-04**	Soil	03/08/16
5	KCH067-005	16C070-05	Soil	03/08/16
6	KCH067-006	16C070-06	Soil	03/08/16
7	KCH067-007	16C070-07	Soil	03/08/16
8	KCH067-008	16C070-08	Soil	03/08/16
9	KCH067-009	16C070-09	Soil	03/08/16
10	KCH067-010	16C070-10	Soil	03/08/16
11	KCH067-011	16C070-11	Soil	03/08/16
12	KCH067-012	16C070-12	Soil	03/08/16
13	KCH067-013	16C070-13	Soil	03/08/16
14	KCH067-014	16C070-14	Soil	03/08/16
15	KCH067-015	16C070-15	Soil	03/08/16
16	KCH067-016**	16C070-16**	Soil	03/08/16
17	KCH067-017	16C070-17	Soil	03/08/16

LDC #: 36282A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/11/16
SDG #: 16C070 Standard/Full Page: 2 of 2
Laboratory: EMAX Laboratories Inc. Reviewer: JO
2nd Reviewer: M

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7199)

	Client ID	Lab ID	Matrix	Date
18	KCH067-018	16C070-18	Soil	03/08/16
19	KCH067-003MS	16C070-03MS	Soil	03/08/16
20	KCH067-003MSD	16C070-03MSD	Soil	03/08/16
21	KCH067-003DUP	16C070-03DUP	Soil	03/08/16
22	KCH067-016MS	16C070-16MS	Soil	03/08/16
23	KCH067-016MSD	16C070-16MSD	Soil	03/08/16
24	KCH067-016DUP	16C070-16DUP	Soil	03/08/16
25				
26				
27				
28				
29				

Notes:

LDC #: 36282A6

VALIDATION FINDINGS CHECKLIST

Reviewer: JD
2nd Reviewer: AC

Method: Inorganics (EPA Method See Cover)

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

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

LDC #: 36282A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: JD
2nd Reviewer: AL

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 11/20/16

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

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ug/l)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0	0	*0.9998*	0.9998	Y
		s2	0.2	0.0000157			
		s3	0.5	0.0000504			
		s4	1	0.0001022			
		s5	2	0.000194			
		s6	5	0.0005014			
		s7	7.5	0.0007527			
		s8	10	0.0010231			
ICV 13:57 Calibration verification	Cr^{+6}	Found 3.725ug/L J	True 4ug/L J		93%R	93%R	
CCV 18:09 Calibration verification	Cr^{+6}	1.900ug/L	2ug/L		95%R	95%R	
Calibration verification							

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

LDC #: 36282A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: JD
2nd Reviewer: 2

METHOD: Inorganics, Method See Cover

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

%R = Found x 100 / True Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

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

RPD = |S-D| x 100 / (S+D)/2 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 12:27	Laboratory control sample	Cr^{+6}	981.3 ug/kg	1000 ug/kg	98%R	98%R	Y
MS	Matrix spike sample		(SSR-SR) 1838 ug/kg	2000 ug/kg	92%R	92%R	
DUP	Duplicate sample		ND	ND	0%RPD	0%RPD	

Comments: _____

LDC #: 36282A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: SD
2nd reviewer: M

METHOD: Inorganics, Method See Cover

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

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

Compound (analyte) results for (4) Cr^{+6} reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{A-(-0.0000035)}{0.0001018}$

Recalculation: $\frac{0.0000787-(-0.0000035)}{0.0001018} = 0.807 ug/L$

A= 0.0000787 In. W= 12.507g FV= 100ml %solids= 0.951 Prep factor = 62.5

$\frac{(0.807 ug/L)(100ml)(62.5)}{(12.507g)(0.951)} = 424 ug/kg$

#	Sample ID	Analyte	Reported Concentration (ug/kg)	Calculated Concentration (ug/kg)	Acceptable (Y/N)
	4	Cr^{+6}	424	424	Y

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 11, 2016

Parameters: Total Petroleum Hydrocarbons as Gasoline

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C070

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-002	16C070-02	Soil	03/08/16
KCH067-004**	16C070-04**	Soil	03/08/16
KCH067-006	16C070-06	Soil	03/08/16
KCH067-008	16C070-08	Soil	03/08/16
KCH067-010	16C070-10	Soil	03/08/16
KCH067-011	16C070-11	Soil	03/08/16
KCH067-013	16C070-13	Soil	03/08/16
KCH067-014	16C070-14	Soil	03/08/16
KCH067-016**	16C070-16**	Soil	03/08/16
KCH067-018	16C070-18	Soil	03/08/16
KCH067-020	16C070-19	Water	03/08/16
KCH067-016MS	16C070-16MS	Soil	03/08/16
KCH067-016MSD	16C070-16MSD	Soil	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Gasoline by Environmental Protection Agency (EPA) SW 846 Method 8015B

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An 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.

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

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-020 was identified as a trip blank. No contaminants were found.

Sample KCH067-019 (from SDG 16C074) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples 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) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Target Compound Identifications

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

XII. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Total Petroleum Hydrocarbons as Gasoline - Field Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

METHOD SW5035A/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/11/16 00:42
Sample ID:	KCH067-002	Date Analyzed:	03/11/16 00:42
Lab Samp ID:	C070-02	Dilution Factor:	0.97
Lab File ID:	EC10023A	Matrix :	SOIL
Ext Btch ID:	GMC009S	% Moisture :	9.0
Calib. Ref.:	EC10014A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	1.1	0.27	0.53

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	1.76	2.132	82.4	67-134

Parameter	H-C Range
Gasoline	C6-C10

METHANOL EXTRACTION: 03/10/16 15:06

3/25/16

METHOD SW5035A/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/11/16 01:21
Sample ID:	KCH067-004	Date Analyzed:	03/11/16 01:21
Lab Samp ID:	C070-04	Dilution Factor:	0.85
Lab File ID:	EC10024A	Matrix :	SOIL
Ext Btch ID:	GMC009S	% Moisture :	4.9
Calib. Ref.:	EC10014A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	0.89	0.22	0.45

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	1.48	1.788	82.9	67-134

Parameter	H-C Range
Gasoline	C6-C10

METHANOL EXTRACTION: 03/10/16 15:06

3/25/16

METHOD SW5035A/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/11/16 02:39
Sample ID:	KCH067-006	Date Analyzed:	03/11/16 02:39
Lab Samp ID:	C070-06	Dilution Factor:	1
Lab File ID:	EC10026A	Matrix :	SOIL
Ext Btch ID:	GMC009S	% Moisture :	2.2
Calib. Ref.:	EC10025A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	1.0	0.26	0.51

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	1.44	2.045	70.6	67-134

Parameter	H-C Range
Gasoline	C6-C10

METHANOL EXTRACTION: 03/10/16 15:06

8/15/16

METHOD SW5035A/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/11/16 03:18
Sample ID:	KCH067-008	Date Analyzed:	03/11/16 03:18
Lab Samp ID:	C070-08	Dilution Factor:	1.04
Lab File ID:	EC10027A	Matrix :	SOIL
Ext Btch ID:	GMC009S	% Moisture :	1.5
Calib. Ref.:	EC10025A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	1.1	0.26	0.53

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	1.55	2.112	73.4	67-134

Parameter	H-C Range
Gasoline	C6-C10

METHANOL EXTRACTION: 03/10/16 15:06

8051716

METHOD SW5035A/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/11/16 03:56
Sample ID:	KCH067-010	Date Analyzed:	03/11/16 03:56
Lab Samp ID:	C070-10	Dilution Factor:	0.86
Lab File ID:	EC10028A	Matrix :	SOIL
Ext Btch ID:	GMC009S	% Moisture :	3.8
Calib. Ref.:	EC10025A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	0.89	0.22	0.45

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	1.34	1.788	75.0	67-134

Parameter	H-C Range
Gasoline	C6-C10

METHANOL EXTRACTION: 03/10/16 15:08

3/25/16

METHOD SW5035A/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/11/16 04:35
Sample ID:	KCH067-011	Date Analyzed:	03/11/16 04:35
Lab Samp ID:	C070-11	Dilution Factor:	0.92
Lab File ID:	EC10029A	Matrix :	SOIL
Ext Btch ID:	GMC009S	% Moisture :	3.1
Calib. Ref.:	EC10025A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	0.95	0.24	0.47

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	1.36	1.899	71.5	67-134

Parameter	H-C Range
Gasoline	C6-C10

METHANOL EXTRACTION: 03/10/16 15:08

3/15/16

METHOD SW5035A/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/11/16 05:14
Sample ID:	KCH067-013	Date Analyzed:	03/11/16 05:14
Lab Samp ID:	C070-13	Dilution Factor:	0.87
Lab File ID:	EC10030A	Matrix :	SOIL
Ext Btch ID:	GMC009S	% Moisture :	5.0
Calib. Ref.:	EC10025A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	0.92	0.23	0.46

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	1.29	1.832	70.6	67-134

Parameter	H-C Range
Gasoline	C6-C10

METHANOL EXTRACTION: 03/10/16 15:08

SLQ 5/17/16

METHOD SW5035A/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/11/16 05:52
Sample ID:	KCH067-014	Date Analyzed:	03/11/16 05:52
Lab Samp ID:	C070-14	Dilution Factor:	0.85
Lab File ID:	EC10031A	Matrix :	SOIL
Ext Btch ID:	GMC009S	% Moisture :	3.9
Calib. Ref.:	EC10025A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	0.88	0.22	0.44

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	1.22	1.769	69.1	67-134

Parameter	H-C Range
Gasoline	C6-C10

METHANOL EXTRACTION: 03/10/16 15:08

3/5/16

METHOD SW5035A/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/11/16 07:10
Sample ID:	KCH067-016	Date Analyzed:	03/11/16 07:10
Lab Samp ID:	C070-16	Dilution Factor:	0.88
Lab File ID:	EC10033A	Matrix :	SOIL
Ext Btch ID:	GMC009S	% Moisture :	2.8
Calib. Ref.:	EC10025A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	0.91	0.23	0.45

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	1.39	1.811	77.0	67-134

Parameter	H-C Range
Gasoline	C6-C10

METHANOL EXTRACTION: 03/10/16 15:08

3/21/16

METHOD SW5035A/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/11/16 06:31
Sample ID:	KCH067-018	Date Analyzed:	03/11/16 06:31
Lab Samp ID:	C070-18	Dilution Factor:	0.94
Lab File ID:	EC10032A	Matrix :	SOIL
Ext Btch ID:	GMC009S	% Moisture :	2.1
Calib. Ref.:	EC10025A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	0.96	0.24	0.48

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	1.43	1.920	74.4	67-134

Parameter	H-C Range
Gasoline	C6-C10

METHANOL EXTRACTION: 03/10/16 15:08

3/15/16

METHOD SW5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/12/16 01:36
Sample ID:	KCH067-020	Date Analyzed:	03/12/16 01:36
Lab Samp ID:	C070-19	Dilution Factor:	1
Lab File ID:	EC11022A	Matrix :	WATER
Ext Btch ID:	VG39C07	% Moisture :	NA
Calib. Ref.:	EC11017A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
GASOLINE	ND	0.10	0.010	0.020

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	0.0347	0.04000	86.6	69-133

Parameter	H-C Range
Gasoline	C6-C10

3/25/16

LDC #: 36282A7 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C070 Standard/Full Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: EJ
2nd Reviewer: MC

METHOD: GC TPH as Gasoline (EPA SW 846 Method 8015B)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / Δ	
II.	Initial calibration/ICV	A / Δ	%RSD / ICV ≤ 20
III.	Continuing calibration	Δ	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB = KCH067-019 (SDG # 16C070-14) TB = 11
VI.	Surrogate spikes	Δ	
VII.	Matrix spike/Matrix spike duplicates	Δ	
VIII.	Laboratory control samples	Δ	LCS ID
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	Δ	Not reviewed for Standard validation.
XI.	Target compound identification	Δ	Not reviewed for Standard validation.
XII	Overall assessment of data	Δ	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-002	16C070-02	Soil	03/08/16
2	KCH067-004**	16C070-04**	Soil	03/08/16
3	KCH067-006	16C070-06	Soil	03/08/16
4	KCH067-008	16C070-08	Soil	03/08/16
5	KCH067-010	16C070-10	Soil	03/08/16
6	KCH067-011	16C070-11	Soil	03/08/16
7	KCH067-013	16C070-13	Soil	03/08/16
8	KCH067-014	16C070-14	Soil	03/08/16
9	KCH067-016**	16C070-16**	Soil	03/08/16
10	KCH067-018	16C070-18	Soil	03/08/16
11	KCH067-020 TB	16C070-19	Water	03/08/16
12	KCH067-016MS	16C070-16MS	Soil	03/08/16
13	KCH067-016MSD	16C070-16MSD	Soil	03/08/16
14				
15				
16	MBLK1W			
17	MBLK1S			

LDC #: 36282A7

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: EZ
2nd Reviewer: EZ

Method: ✓ GC _____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?		✓		
Were the RT windows properly established?			✓	
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) < 20% or percent recoveries (%R) 80-120%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 36282A7

VALIDATION FINDINGS CHECKLIST

Reviewer: EJ
2nd Reviewer: AC

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 36282A7

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC ✓ HPLC _____

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (500 std)	Recalculated CF (500 std)	Reported CF (initial)	Recalculated CF (intial)	Reported %RSD	Recalculated %RSD
1	ICAL	2/18/16	GRO (C_6-C_{10})	17177	17177	16318.3	16318.3	4.6	4.6
2									
3									
4									

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

LDC #: 36282A7

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: AC

METHOD: GC ✓ HPLC _____

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

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	ccv 18:53	3/10/16	GRO C_6-C_{10}	500.0	478.39	478.39	4	4
2	ccv 0200	3/11/16	↓	500.0	431.66	431.66	14	14
3								
4								

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

LDC #: 36282A7

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer: TC

METHOD: ✓ GC ___ HPLC

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #9

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
4-BFB	✓	40	30.79	77	77	0

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 36282A7

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: ✓ GC __HPLC

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

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration; SC = Sample concentration; SA = Spike added; MS = Matrix spike; MSD = Matrix spike duplicate

MS/MSD samples: 12 + 13

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	22.9	23.1	ND	19.4	20.8	85	85	90	90	6	6
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											

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

LDC #: 36282A7

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

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

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration; LCS = Laboratory Control Sample; SA = Spike added; LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: GMC0095L/SC

Compound	Spike Added (mg/kg)		Spike Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	25.0	25.0	21.9	25.0	87	87	100	100	13	13
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										

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

LDC #: 36282A7

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: ___ GC ___ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. GMC0095L Compound Name gasoline C_6-C_{10}

Concentration = $\frac{(7135846.0)(5)(5)}{(16318.3)(5.01)(0.1)}$ = 21.82 mg/kg

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 13, 2016

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C070

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-001	16C070-01	Soil	03/08/16
KCH067-002	16C070-02	Soil	03/08/16
KCH067-003	16C070-03	Soil	03/08/16
KCH067-004**	16C070-04**	Soil	03/08/16
KCH067-005	16C070-05	Soil	03/08/16
KCH067-006	16C070-06	Soil	03/08/16
KCH067-007	16C070-07	Soil	03/08/16
KCH067-008	16C070-08	Soil	03/08/16
KCH067-009	16C070-09	Soil	03/08/16
KCH067-010	16C070-10	Soil	03/08/16
KCH067-011	16C070-11	Soil	03/08/16
KCH067-012	16C070-12	Soil	03/08/16
KCH067-013	16C070-13	Soil	03/08/16
KCH067-014	16C070-14	Soil	03/08/16
KCH067-015	16C070-15	Soil	03/08/16
KCH067-016**	16C070-16**	Soil	03/08/16
KCH067-017	16C070-17	Soil	03/08/16
KCH067-018	16C070-18	Soil	03/08/16
KCH067-003MS	16C070-03MS	Soil	03/08/16
KCH067-003MSD	16C070-03MSD	Soil	03/08/16
KCH067-016MS	16C070-16MS	Soil	03/08/16
KCH067-016MSD	16C070-16MSD	Soil	03/08/16
KCH067-001DL	16C070-01DL	Soil	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An 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.

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

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-019 (from SDG 16C074) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples 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) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Target Compound Identifications

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

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Flag	A or P
KCH067-001DL	All compounds	R	A

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

China Lake CTO 067
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 16C070

Sample	Compound	Flag	A or P	Reason (Code)
KCH067-001DL	All compounds	R	A	Overall assessment of data (22)

China Lake CTO 067
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID:	KCH067-001	Date Analyzed:	03/16/16 12:52
Lab Samp ID:	C070-01N	Dilution Factor:	1
Lab File ID:	LC16007A	Matrix	: SOIL
Ext Btch ID:	DSC012S	% Moisture	: 4.3
Calib. Ref.:	LC16004A	Instrument ID	: D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	10	2.6	5.2
JP-5	3.1J	21	2.6	5.2
MOTOR OIL	91	21	2.6	5.2

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	97.0	104.5	92.8	60-130
HEXACOSANE	29.5	26.12	113	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/25/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID:	KCH067-001	Date Analyzed:	03/15/16 19:55
Lab Samp ID:	C070-01I	Dilution Factor:	2
Lab File ID:	LC15017A	Matrix :	SOIL
Ext Btch ID:	DSC012S	% Moisture :	4.3
Calib. Ref.:	LC15011A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND R(22)	21	5.2	10
JP-5	ND	42	5.2	10
MOTOR OIL	62	42	5.2	10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	93.8	104.5	89.8	60-130
HEXACOSANE	31.8	26.13	121.7	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/15/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID	: KCH067-002	Date Analyzed:	03/15/16 20:12
Lab Samp ID	: C070-02	Dilution Factor:	1
Lab File ID	: LC15018A	Matrix	: SOIL
Ext Btch ID	: DSC012S	% Moisture	: 9.0
Calib. Ref.	: LC15011A	Instrument ID	: D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	11	2.7	5.5
JP-5	ND	22	2.7	5.5
MOTOR OIL	ND	22	2.7	5.5

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	103	109.9	93.5	60-130
HEXACOSANE	30.9	27.47	113	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/25/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID:	KCH067-003	Date Analyzed:	03/16/16 13:09
Lab Samp ID:	C070-03N	Dilution Factor:	1
Lab File ID:	LC16008A	Matrix :	SOIL
Ext Btch ID:	DSC012S	% Moisture :	6.9
Calib. Ref.:	LC16004A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	11	2.7	5.4
JP-5	ND	21	2.7	5.4
MOTOR OIL	160	21	2.7	5.4

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	104	107.4	96.7	60-130
HEXACOSANE	29.3	26.85	109	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

SCS 17/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID:	KCH067-004	Date Analyzed:	03/15/16 21:20
Lab Samp ID:	C070-04	Dilution Factor:	1
Lab File ID:	LC15022A	Matrix	: SOIL
Ext Btch ID:	DSC012S	% Moisture	: 4.9
Calib. Ref.:	LC15011A	Instrument ID	: D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	11	2.6	5.3
JP-5	ND	21	2.6	5.3
MOTOR OIL	ND	21	2.6	5.3

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	95.4	105.2	90.7	60-130
HEXACOSANE	27.6	26.29	105	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

8/25/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID:	KCH067-005	Date Analyzed:	03/15/16 22:27
Lab Samp ID:	C070-05	Dilution Factor:	1
Lab File ID:	LC15026A	Matrix :	SOIL
Ext Btch ID:	DSC012S	% Moisture :	2.7
Calib. Ref.:	LC15024A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	10	2.6	5.1
JP-5	ND	21	2.6	5.1
MOTOR OIL	2.6J	21	2.6	5.1

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	89.8	102.8	87.3	60-130
HEXACOSANE	26.4	25.69	103	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

8451716

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID:	KCH067-006	Date Analyzed:	03/15/16 22:44
Lab Samp ID:	C070-06	Dilution Factor:	1
Lab File ID:	LC15027A	Matrix :	SOIL
Ext Btch ID:	DSC012S	% Moisture :	2.2
Calib. Ref.:	LC15024A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	10	2.6	5.1
JP-5	ND	20	2.6	5.1
MOTOR OIL	ND	20	2.6	5.1

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	88.1	102.2	86.1	60-130
HEXACOSANE	26.6	25.56	104	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

8/05/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID:	KCH067-007	Date Analyzed:	03/15/16 23:01
Lab Samp ID:	C070-07	Dilution Factor:	1
Lab File ID:	LC15028A	Matrix	: SOIL
Ext Btch ID:	DSC012S	% Moisture	: 1.9
Calib. Ref.:	LC15024A	Instrument ID	: D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	10	2.5	5.1
JP-5	ND	20	2.5	5.1
MOTOR OIL	ND	20	2.5	5.1

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	88.0	101.9	86.4	60-130
HEXACOSANE	26.3	25.48	103	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/17/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C070	Date Extracted: 03/15/16 13:30
Sample ID: KCH067-008	Date Analyzed: 03/15/16 23:18
Lab Samp ID: C070-08	Dilution Factor: 1
Lab File ID: LC15029A	Matrix : SOIL
Ext Btch ID: DSC012S	% Moisture : 1.5
Calib. Ref.: LC15024A	Instrument ID : D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	10	2.5	5.1
JP-5	ND	20	2.5	5.1
MOTOR OIL	ND	20	2.5	5.1

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	84.2	101.5	82.9	60-130
HEXACOSANE	26.4	25.38	104	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/25/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID:	KCH067-009	Date Analyzed:	03/15/16 23:18
Lab Samp ID:	C070-09N	Dilution Factor:	1
Lab File ID:	LC16011A	Matrix :	SOIL
Ext Btch ID:	DSC012S	% Moisture :	2.9
Calib. Ref.:	LC16004A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	210	10	2.6	5.1
JP-5	180	21	2.6	5.1
MOTOR OIL	ND	21	2.6	5.1

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	94.4	103.0	91.7	60-130
HEXACOSANE	27.6	25.75	107	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/25/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID:	KCH067-010	Date Analyzed:	03/16/16 14:17
Lab Samp ID:	C070-10N	Dilution Factor:	1
Lab File ID:	LC16012A	Matrix	: SOIL
Ext Btch ID:	DSC012S	% Moisture	: 3.8
Calib. Ref.:	LC16004A	Instrument ID	: D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	84	10	2.6	5.2
JP-5	83	21	2.6	5.2
MOTOR OIL	ND	21	2.6	5.2

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	89.3	104.0	85.9	60-130
HEXACOSANE	25.0	25.99	96.2	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

5/25/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID	: KCH067-011	Date Analyzed:	03/16/16 14:34
Lab Samp ID	: C070-11N	Dilution Factor:	1
Lab File ID	: LC16013A	Matrix	: SOIL
Ext Btch ID	: DSC012S	% Moisture	: 3.1
Calib. Ref.	: LC16004A	Instrument ID	: D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	180	10	2.6	5.2
JP-5	150	21	2.6	5.2
MOTOR OIL	ND	21	2.6	5.2

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	93.7	103.2	90.8	60-130
HEXACOSANE	27.9	25.80	108	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/17/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID:	KCH067-012	Date Analyzed:	03/16/16 00:26
Lab Samp ID:	C070-12	Dilution Factor:	1
Lab File ID:	LC15033A	Matrix :	SOIL
Ext Btch ID:	DSC012S	% Moisture :	3.5
Calib. Ref.:	LC15024A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	10	2.6	5.2
JP-5	ND	21	2.6	5.2
MOTOR OIL	ND	21	2.6	5.2

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	88.2	103.6	85.1	60-130
HEXACOSANE	25.7	25.91	99.2	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

8/05/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID	: KCH067-013	Date Analyzed:	03/16/16 00:43
Lab Samp ID	: C070-13	Dilution Factor:	1
Lab File ID	: LC15034A	Matrix :	SOIL
Ext Btch ID	: DSC012S	% Moisture :	5.0
Calib. Ref.	: LC15024A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	11	2.6	5.3
JP-5	ND	21	2.6	5.3
MOTOR OIL	ND	21	2.6	5.3

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	89.0	105.3	84.6	60-130
HEXACOSANE	26.1	26.32	99.1	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

SG 5/17/16

5030

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID	: KCH067-014	Date Analyzed:	03/16/16 14:51
Lab Samp ID	: C070-14N	Dilution Factor:	1
Lab File ID	: LC16014A	Matrix :	SOIL
Ext Btch ID	: DSC012S	% Moisture :	3.9
Calib. Ref.	: LC16004A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	8.8J	10	2.6	5.2
JP-5	7.9J	21	2.6	5.2
MOTOR OIL	ND	21	2.6	5.2

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	94.7	104.1	91.0	60-130
HEXACOSANE	28.1	26.01	108	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

8051716

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID	: KCH067-015	Date Analyzed:	03/16/16 01:50
Lab Samp ID	: C070-15	Dilution Factor:	1
Lab File ID	: LC15038A	Matrix :	SOIL
Ext Btch ID	: DSC012S	% Moisture :	3.6
Calib. Ref.	: LC15036A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	10	2.6	5.2
JP-5	ND	21	2.6	5.2
MOTOR OIL	ND	21	2.6	5.2

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	88.4	103.7	85.2	60-130
HEXACOSANE	24.8	25.93	95.7	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/25/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID:	KCH067-016	Date Analyzed:	03/16/16 02:07
Lab Samp ID:	C070-16	Dilution Factor:	1
Lab File ID:	LC15039A	Matrix :	SOIL
Ext Btch ID:	DSC012S	% Moisture :	2.8
Calib. Ref.:	LC15036A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	10	2.6	5.1
JP-5	ND	21	2.6	5.1
MOTOR OIL	ND	21	2.6	5.1

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	89.7	102.9	87.2	60-130
HEXACOSANE	25.3	25.72	98.5	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

SL051716

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID:	KCH067-017	Date Analyzed:	03/16/16 15:08
Lab Samp ID:	C070-17N	Dilution Factor:	1
Lab File ID:	LC16015A	Matrix :	SOIL
Ext Btch ID:	DSC012S	% Moisture :	0.0
Calib. Ref.:	LC16004A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	10	2.5	5.0
JP-5	ND	20	2.5	5.0
MOTOR OIL	69	20	2.5	5.0

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	90.4	100.0	90.4	60-130
HEXACOSANE	26.9	25.00	108	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/16/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 13:30
Sample ID	: KCH067-018	Date Analyzed:	03/16/16 03:15
Lab Samp ID	: C070-18	Dilution Factor:	1
Lab File ID	: LC15043A	Matrix	: SOIL
Ext Btch ID	: DSC012S	% Moisture	: 2.1
Calib. Ref.	: LC15036A	Instrument ID	: D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	10	2.6	5.1
JP-5	ND	20	2.6	5.1
MOTOR OIL	ND	20	2.6	5.1

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	85.1	102.1	83.3	60-130
HEXACOSANE	24.3	25.54	95.0	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

4/05/16

LDC #: 36282A8 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C070 Standard/Full Page: 1 of 2
Laboratory: EMAX Laboratories Inc. Reviewer: EF
2nd Reviewer: AC

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%RSD/ICV ≤20
III.	Continuing calibration	A	CCV ≤20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB = KCH067-019 (SDG# 16C074)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Standard validation.
XI.	Target compound identification	A	Not reviewed for Standard validation.
XII	Overall assessment of data	SW	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-001	16C070-01	Soil	03/08/16
2	KCH067-002	16C070-02	Soil	03/08/16
3	KCH067-003	16C070-03	Soil	03/08/16
4	KCH067-004**	16C070-04**	Soil	03/08/16
5	KCH067-005	16C070-05	Soil	03/08/16
6	KCH067-006	16C070-06	Soil	03/08/16
7	KCH067-007	16C070-07	Soil	03/08/16
8	KCH067-008	16C070-08	Soil	03/08/16
9	KCH067-009	16C070-09	Soil	03/08/16
10	KCH067-010	16C070-10	Soil	03/08/16
11	KCH067-011	16C070-11	Soil	03/08/16
12	KCH067-012	16C070-12	Soil	03/08/16
13	KCH067-013	16C070-13	Soil	03/08/16
14	KCH067-014	16C070-14	Soil	03/08/16
15	KCH067-015	16C070-15	Soil	03/08/16
16	KCH067-016**	16C070-16**	Soil	03/08/16
17	KCH067-017	16C070-17	Soil	03/08/16

LDC #: 36282A8 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C070 Standard/Full Page: 2 of 2
Laboratory: EMAX Laboratories Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

	Client ID	Lab ID	Matrix	Date
18	KCH067-018	16C070-18	Soil	03/08/16
19	KCH067-003MS	16C070-03MS	Soil	03/08/16
20	KCH067-003MSD	16C070-03MSD	Soil	03/08/16
21	KCH067-016MS	16C070-16MS	Soil	03/08/16
22	KCH067-016MSD	16C070-16MSD	Soil	03/08/16
23	# 1DL	16C070-01 DL	SOIL	3/8/16
24				
25				
26				
27				

Notes:

LDC #: 36287A8

VALIDATION FINDINGS CHECKLIST

Reviewer: P
2nd Reviewer: R

Method: ✓ GC _____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?		✓		
Were the RT windows properly established?			✓	
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) < 20% or percent recoveries (%R) 80-120%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.			✓	
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 36282AX

VALIDATION FINDINGS CHECKLIST

Reviewer: RP
2nd Reviewer: AC

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 36282A8

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: ✓ **GC** __ **HPLC**

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results? Code # 22

#	Associated Samples	Compound Name	Findings	Qualifications
	23	all	diluted	P/A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 36282A4

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: KC

METHOD: GC ✓ HPLC ____

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (50.0 std)	Recalculated CF (50.0 std)	Reported CF (initial)	Recalculated CF (intial)	Reported %RSD	Recalculated %RSD
1	ICAL	3/9/16	Diesel C10-C24	33825	33825	31896.9	31896.9	12.9	12.9
2									
3									
4									

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

LDC #: 36282A8

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC _____

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

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported	Recalculated	Reported	Recalculated
					CF/ Conc. CCV	CF/ Conc. CCV	%D	%D
1	CCV 14:48	3/15/16	Diesel $C_{10}-C_{24}$	500.0	489.25	489.25	2	2
2	CCV 0116	3/16/16	↓	500.0	493.21	493.21	1	1
3	CCV 1149	3/16/16	↓	500.0	478.36	478.36	4	4
4								

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

LDC #: 36282AS

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer: PC

METHOD: ___ GC ___ HPLC

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #16

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Bromobenzene	✓	100	87.167	87.2	87.2	0
Hexacosane		25	24.635	98.5	98.5	0

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 36282A8

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: __ GC __HPLC

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

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration
SC = Sample concentration
SA = Spike added
MS = Matrix spike
MSD = Matrix spike duplicate

MS/MSD samples: 19 + 20

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	537	537	ND	519	547	97	97	102	102	5	5
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											

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

LDC #: 36282T8

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: ✓ GC ___HPLC

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

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: DSC012SL /SC

Compound	Spike Added (mg/kg)		Spike Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)	500	500	571	523	114	114	105	105	9	9
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										

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

LDC #: 36282AJ

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd Reviewer: AC

METHOD: ✓ **GC** __ **HPLC**

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. DSC0125L Compound Name Dieldrin

Concentration = $\frac{1822.3298 \quad (10)}{31896.87324 \quad (10)}$ =

= 57.1 mg/kg

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 11, 2016

Parameters: Explosives

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C070

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-005	16C070-05	Soil	03/08/16
KCH067-006	16C070-06	Soil	03/08/16
KCH067-007	16C070-07	Soil	03/08/16
KCH067-008	16C070-08	Soil	03/08/16
KCH067-009	16C070-09	Soil	03/08/16
KCH067-010	16C070-10	Soil	03/08/16
KCH067-011	16C070-11	Soil	03/08/16
KCH067-012	16C070-12	Soil	03/08/16
KCH067-013	16C070-13	Soil	03/08/16
KCH067-014	16C070-14	Soil	03/08/16
KCH067-015	16C070-15	Soil	03/08/16
KCH067-016**	16C070-16**	Soil	03/08/16
KCH067-017	16C070-17	Soil	03/08/16
KCH067-018	16C070-18	Soil	03/08/16
KCH067-016MS	16C070-16MS	Soil	03/08/16
KCH067-016MSD	16C070-16MSD	Soil	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Explosives by Environmental Protection Agency (EPA) SW 846 Method 8330A

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An 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.

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

Retention time windows were established as required by the method for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

Retention times of all compounds in the calibration standards were within the established retention time windows for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-019 (from SDG 16C074) was identified as an equipment blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples 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) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Target Compound Identifications

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

XII. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Explosives - Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Explosives - Laboratory Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Explosives - Field Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID	: KCH067-005	Date Analyzed:	03/16/16 19:42
Lab Samp ID	: C070-05	Dilution Factor:	1
Lab File ID	: XC16007A	Matrix :	SOIL
Ext Btch ID	: EXC006S	% Moisture :	NA
Calib. Ref.	: XC16002A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2140	2000	107	60-140

Note: All positive results are confirmed by Biphenyl column

SL 3/17/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID	: KCH067-006	Date Analyzed:	03/16/16 20:18
Lab Samp ID	: C070-06	Dilution Factor:	1
Lab File ID	: XC16008A	Matrix :	SOIL
Ext Btch ID	: EXC006S	% Moisture :	NA
Calib. Ref.	: XC16002A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2310	2000	116	60-140

Note: All positive results are confirmed by Biphenyl column

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID	: KCH067-007	Date Analyzed:	03/16/16 21:01
Lab Samp ID	: C070-07	Dilution Factor:	1
Lab File ID	: XC16009A	Matrix :	SOIL
Ext Btch ID	: EXC006S	% Moisture :	NA
Calib. Ref.	: XC16002A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2170	2000	108	60-140

Note: All positive results are confirmed by Biphenyl column

SC 051716

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID:	KCH067-008	Date Analyzed:	03/16/16 21:38
Lab Samp ID:	C070-08	Dilution Factor:	1
Lab File ID:	XC16010A	Matrix :	SOIL
Ext Btch ID:	EXC006S	% Moisture :	NA
Calib. Ref.:	XC16002A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2130	2000	106	60-140

Note: All positive results are confirmed by Biphenyl column

Sl 03/17/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID	: KCH067-009	Date Analyzed:	03/16/16 22:21
Lab Samp ID	: C070-09	Dilution Factor:	1
Lab File ID	: XC16011A	Matrix :	SOIL
Ext Btch ID	: EXC006S	% Moisture :	NA
Calib. Ref.	: XC16002A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	280J	400	50	100
RDX	4600	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2060	2000	103	60-140

Note: All positive results are confirmed by Biphenyl column

SG 5/7/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID	: KCH067-010	Date Analyzed:	03/16/16 22:58
Lab Samp ID	: C070-10	Dilution Factor:	1
Lab File ID	: XC16012A	Matrix :	SOIL
Ext Btch ID	: EXC006S	% Moisture :	NA
Calib. Ref.	: XC16002A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2140	2000	107	60-140

Note: All positive results are confirmed by Biphenyl column

3/25/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID	: KCH067-011	Date Analyzed:	03/16/16 23:41
Lab Samp ID	: C070-11	Dilution Factor:	1
Lab File ID	: XC16013A	Matrix :	SOIL
Ext Btch ID	: EXC006S	% Moisture :	NA
Calib. Ref.	: XC16002A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	440	400	50	100
RDX	2000	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2100	2000	105	60-140

Note: All positive results are confirmed by Biphenyl column

3/17/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID:	KCH067-012	Date Analyzed:	03/17/16 02:21
Lab Samp ID:	C070-12	Dilution Factor:	1
Lab File ID:	XC16017A	Matrix :	SOIL
Ext Btch ID:	EXC006S	% Moisture :	NA
Calib. Ref.:	XC16015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	390J	400	50	100
RDX	620	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2250	2000	113	60-140

Note: All positive results are confirmed by Biphenyl column

8/17/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID:	KCH067-013	Date Analyzed:	03/17/16 02:58
Lab Samp ID:	C070-13	Dilution Factor:	1
Lab File ID:	XC16018A	Matrix :	SOIL
Ext Btch ID:	EXC006S	% Moisture :	NA
Calib. Ref.:	XC16015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2120	2000	106	60-140

Note: All positive results are confirmed by Biphenyl column

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID:	KCH067-014	Date Analyzed:	03/17/16 03:41
Lab Samp ID:	C070-14	Dilution Factor:	1
Lab File ID:	XC16019A	Matrix :	SOIL
Ext Btch ID:	EXC006S	% Moisture :	NA
Calib. Ref.:	XC16015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	92J	400	50	100
RDX	150J	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2180	2000	109	60-140

Note: All positive results are confirmed by Biphenyl column

Sdc 7/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID	: KCH067-015	Date Analyzed:	03/17/16 04:18
Lab Samp ID	: C070-15	Dilution Factor:	1
Lab File ID	: XC16020A	Matrix :	SOIL
Ext Btch ID	: EXC006S	% Moisture :	NA
Calib. Ref.	: XC16015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2150	2000	107	60-140

Note: All positive results are confirmed by Biphenyl column

8/6/17/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID:	KCH067-016	Date Analyzed:	03/17/16 05:01
Lab Samp ID:	C070-16	Dilution Factor:	1
Lab File ID:	XC16021A	Matrix :	SOIL
Ext Btch ID:	EXC006S	% Moisture :	NA
Calib. Ref.:	XC16015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2050	2000	102	60-140

Note: All positive results are confirmed by Biphenyl column

3/25/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID:	KCH067-017	Date Analyzed:	03/17/16 06:58
Lab Samp ID:	C070-17	Dilution Factor:	1
Lab File ID:	XC16024A	Matrix :	SOIL
Ext Btch ID:	EXC006S	% Moisture :	NA
Calib. Ref.:	XC16015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2100	2000	105	60-140

Note: All positive results are confirmed by Biphenyl column.

3/21/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C070	Date Extracted:	03/15/16 16:30
Sample ID	: KCH067-018	Date Analyzed:	03/17/16 07:41
Lab Samp ID	: C070-18	Dilution Factor:	1
Lab File ID	: XC16025A	Matrix :	SOIL
Ext Btch ID	: EXC006S	% Moisture :	NA
Calib. Ref.	: XC16015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2120	2000	106	60-140

Note: All positive results are confirmed by Biphenyl column

SK 5/17/16

LDC #: 36282A40 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C070 Standard/Full Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: EJ
2nd Reviewer:

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%D ≤ 20 ICV ≤ ~~20~~ 15 CCV ≤ ~~20~~ 15 (F7)
III.	Continuing calibration	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB- KCH067-019 (16C074)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS ID
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Standard validation.
XI.	Target compound identification	A	Not reviewed for Standard validation.
XII.	System performance	A	Not reviewed for Standard validation.
XIII.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-005	16C070-05	Soil	03/08/16
2	KCH067-006	16C070-06	Soil	03/08/16
3	KCH067-007	16C070-07	Soil	03/08/16
4	KCH067-008	16C070-08	Soil	03/08/16
5	KCH067-009	16C070-09	Soil	03/08/16
6	KCH067-010	16C070-10	Soil	03/08/16
7	KCH067-011	16C070-11	Soil	03/08/16
8	KCH067-012	16C070-12	Soil	03/08/16
9	KCH067-013	16C070-13	Soil	03/08/16
10	KCH067-014	16C070-14	Soil	03/08/16
11	KCH067-015	16C070-15	Soil	03/08/16
12	KCH067-016**	16C070-16**	Soil	03/08/16
13	KCH067-017	16C070-17	Soil	03/08/16
14	KCH067-018	16C070-18	Soil	03/08/16
15	KCH067-016MS	16C070-16MS	Soil	03/08/16
16	KCH067-016MSD	16C070-16MSD	Soil	03/08/16

LDC #: 36282A40 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16

SDG #: 16C070 Standard/Full Page: 2 of 2

Laboratory: EMAX Laboratories Inc. Reviewer:

2nd Reviewer:

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

	Client ID	Lab ID	Matrix	Date
17				
18				
19				
20				
21				

Notes:

	MBLK1S						

LDC #: 36282A40

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer:
2nd Reviewer:

Method: X GC ____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?			✓	
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 15%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 15%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 36282A4U

VALIDATION FINDINGS CHECKLIST

Reviewer: EF
2nd Reviewer: Q

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 36282A40

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC ~~HPLC~~ HPLC

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (100 std)	Recalculated CF (100 std)	Reported CF (initial)	Recalculated CF (intial)	Reported %RSD	Recalculated %RSD
1	ICAL	1/27/16	HMX (C18)	145	145.15	151.7	151.7	6.9	6.9
			2,4,6 TNT	430	429.84	410.8	410.8	6.3	6.3
2	ICAL	1/20/16	HMX (Biphenyl)	124	123.6	122.9	122.9	9.8	9.8
			2,4,6 TNT	321	320.7	322.0	322.0	6.1	6.1
3									
4									

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

LDC #: 36282A40

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC ~~X~~ HPLC

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

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	CCV 1618	3/16/16	HMX (C18)	400.0	F1 ~~151.7~~ 403.75	403.75	1	1
			2,4,6-TNT	400.0	384.47	384.47	4	4
2	CCV 01:01	3/17/17	HMX (C18)	400.0	F1 ~~151.7~~ 418.33	418.33	5	5
			2,4,6-TNT	400.0	392.95	392.95	2	2
3	CCV 1246	3/22/16	HMX (Biphenyl)	200.0	219.40	219.40	10	10
			2,4,6-TNT	200.0	183.57	183.57	8	8
4								

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

LDC #: 36282A40

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: EJ
2nd reviewer: DC

METHOD: ~~GC~~ HPLC

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #12

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
3,4- Dinitrotoluene	C-18 ch A	2050	2000	102	102	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #: 36282A40

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer: A

METHOD: ~~GC~~ HPLC

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

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration; SC = Sample concentration; SA = Spike added; MS = Matrix spike; MSD = Matrix spike duplicate

MS/MSD samples: 15 + 16

Compound	Spike Added (ug/kg)		Sample Conc. (ug/kg)	Spike Sample Concentration (ug/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)	2000	2000	ND	2360	2150	118	118	107	107	10	10
2,4,6-Trinitrotoluene (8330)	2000	2000	ND	1980	2020	99	99	101	101	2	2
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											

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

LDC #: 36282A40

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: ~~GC~~ HPLC

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

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration; SA = Spike added
LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: EX C0060SL/SC

Compound	Spike Added (ug/kg)		Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)	2000	2000	2190	2300	109	109	115	115	5	5
2,4,6-Trinitrotoluene (8330)	↓	↓	2110	2080	106	106	104	104	2	2
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										

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

LDC #: 36282A4O

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd Reviewer: K

METHOD: ✓ **GC** __ **HPLC** (circled)

Y (circled) N N/A Were all reported results recalculated and verified for all level IV samples?
Y (circled) N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration = $\frac{(A)(Fv)(Df)}{(RF)(Vs\ or\ Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. LCS Compound Name HMX

Concentration = $\frac{(33210)(20)}{(151.7)(2)}$

= 2190 ug/kg

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: ______

SAMPCALCnew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 12, 2016

Parameters: Perchlorate

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C070

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-005	16C070-05	Soil	03/08/16
KCH067-006	16C070-06	Soil	03/08/16
KCH067-007	16C070-07	Soil	03/08/16
KCH067-008	16C070-08	Soil	03/08/16
KCH067-009	16C070-09	Soil	03/08/16
KCH067-010	16C070-10	Soil	03/08/16
KCH067-011	16C070-11	Soil	03/08/16
KCH067-012	16C070-12	Soil	03/08/16
KCH067-013	16C070-13	Soil	03/08/16
KCH067-014	16C070-14	Soil	03/08/16
KCH067-015	16C070-15	Soil	03/08/16
KCH067-016**	16C070-16**	Soil	03/08/16
KCH067-017	16C070-17	Soil	03/08/16
KCH067-018	16C070-18	Soil	03/08/16
KCH067-016MS	16C070-16MS	Soil	03/08/16
KCH067-016MSD	16C070-16MSD	Soil	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Perchlorate by Environmental Protection Agency (EPA) SW 846 Method 6850

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance check was performed prior to initial calibration.

All perchlorate ion signal to noise ratio requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

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

The isotope ratios were within QC limits.

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 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%.

The isotope ratios were within QC limits.

V. Laboratory Blanks

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

VI. Field Blanks

Sample KCH067-019 (from SDG 16C074) was identified as an equipment blank. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

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

XI. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XII. Target Compound Identifications

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

XIII. System Performance

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

XIV. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Perchlorate - Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Perchlorate - Laboratory Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

China Lake CTO 067
Perchlorate - Field Blank Data Qualification Summary - SDG 16C070

No Sample Data Qualified in this SDG

METHOD SW6850
PERCHLORATE

Client : KLEINFELDER
Project : NAWS CHINA LAKE, CTO 067
Batch No. : 16C070

Matrix : SOIL
InstrumentID : G0

Client SAMPLE ID	EMAX SAMPLE ID	RESULT (ug/kg)	DIL'N. FACTOR	MOIST (%)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1S	PLC002SB	ND	1	NA	4	0.5	1	03/23/1615:38	03/15/1610:37	16MC23024	MC23021	16PLC002S	NA	NA
LCS1S	PLC002SL	4.50	1	NA	4	0.5	1	03/23/1615:53	03/15/1610:37	16MC23025	MC23021	16PLC002S	NA	NA
LCD1S	PLC002SC	4.48	1	NA	4	0.5	1	03/23/1616:08	03/15/1610:37	16MC23026	MC23021	16PLC002S	NA	NA
KCH067-005	C070-05	ND	1	2.7	4.11	0.514	1.03	03/23/1616:25	03/15/1610:37	16MC23027	MC23021	16PLC002S	03/08/1613:25	03/10/16
KCH067-006	C070-06	ND	1	2.2	4.09	0.511	1.02	03/23/1616:40	03/15/1610:37	16MC23028	MC23021	16PLC002S	03/08/1613:40	03/10/16
KCH067-007	C070-07	ND	1	1.9	4.08	0.51	1.02	03/23/1616:55	03/15/1610:37	16MC23029	MC23021	16PLC002S	03/08/1613:45	03/10/16
KCH067-008	C070-08	ND	1	1.5	4.06	0.508	1.02	03/23/1617:10	03/15/1610:37	16MC23030	MC23021	16PLC002S	03/08/1613:55	03/10/16
KCH067-009	C070-09	ND	1	2.9	4.12	0.515	1.03	03/23/1617:24	03/15/1610:37	16MC23031	MC23021	16PLC002S	03/08/1614:00	03/10/16
KCH067-010	C070-10	ND	1	3.8	4.16	0.52	1.04	03/23/1617:39	03/15/1610:37	16MC23032	MC23021	16PLC002S	03/08/1614:05	03/10/16
KCH067-011	C070-11	1.63J	1	3.1	4.13	0.516	1.03	03/23/1617:53	03/15/1610:37	16MC23033	MC23021	16PLC002S	03/08/1614:10	03/10/16
KCH067-012	C070-12	22.4	1	3.5	4.15	0.518	1.04	03/24/1611:54	03/15/1610:37	16MC23051	MC23046	16PLC002S	03/08/1614:20	03/10/16
KCH067-013	C070-13	2.17J	1	5.0	4.21	0.526	1.05	03/24/1612:09	03/15/1610:37	16MC23052	MC23046	16PLC002S	03/08/1614:25	03/10/16
KCH067-014	C070-14	4.79	1	3.9	4.16	0.52	1.04	03/24/1612:23	03/15/1610:37	16MC23053	MC23046	16PLC002S	03/08/1614:30	03/10/16
KCH067-015	C070-15	ND	1	3.6	4.15	0.519	1.04	03/24/1612:38	03/15/1610:37	16MC23054	MC23046	16PLC002S	03/08/1614:50	03/10/16
KCH067-016	C070-16	2.53J	1	2.8	4.12	0.514	1.03	03/24/1612:52	03/15/1610:37	16MC23055	MC23046	16PLC002S	03/08/1615:00	03/10/16
KCH067-016MS	C070-16M	7.10	1	2.8	4.12	0.514	1.03	03/24/1613:07	03/15/1610:37	16MC23056	MC23046	16PLC002S	03/08/1615:00	03/10/16
KCH067-016MSD	C070-16S	7.04	1	2.8	4.12	0.514	1.03	03/24/1613:21	03/15/1610:37	16MC23057	MC23046	16PLC002S	03/08/1615:00	03/10/16
KCH067-017	C070-17	24.4	1	0.0	4	0.5	1	03/24/1613:36	03/15/1610:37	16MC23058	MC23046	16PLC002S	03/08/1615:20	03/10/16
KCH067-018	C070-18	5.13	1	2.1	4.09	0.511	1.02	03/24/1613:51	03/15/1610:37	16MC23059	MC23046	16PLC002S	03/08/1615:30	03/10/16

LDC #: 36282A87 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16
SDG #: 16C070 Standard/Full Page: 1 of 2
Laboratory: EMAX Laboratories Inc. Reviewer: FM
2nd Reviewer: AC

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.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	auto Tune
III.	Initial calibration/ICV	A/A	~~%RSD ≤20 r²~~ FM ICV ≤15 CCV ≤15 LODV ≤30
IV.	Continuing calibration	A	
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB= KCH067-019 (16C074)
VII.	Surrogate spikes	N	not required
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS IP
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Standard validation.
XIII.	Target compound identification	A	Not reviewed for Standard validation.
XIV.	System performance	A	Not reviewed for Standard validation.
XV.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-005	16C070-05	Soil	03/08/16
2	KCH067-006	16C070-06	Soil	03/08/16
3	KCH067-007	16C070-07	Soil	03/08/16
4	KCH067-008	16C070-08	Soil	03/08/16
5	KCH067-009	16C070-09	Soil	03/08/16
6	KCH067-010	16C070-10	Soil	03/08/16
7	KCH067-011	16C070-11	Soil	03/08/16
8	KCH067-012	16C070-12	Soil	03/08/16
9	KCH067-013	16C070-13	Soil	03/08/16
10	KCH067-014	16C070-14	Soil	03/08/16
11	KCH067-015	16C070-15	Soil	03/08/16
12	KCH067-016**	16C070-16**	Soil	03/08/16
13	KCH067-017	16C070-17	Soil	03/08/16

LDC #: 36282A87 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16
SDG #: 16C070 Standard/Full Page: 2 of 2
Laboratory: EMAX Laboratories Inc. Reviewer: FJ
2nd Reviewer: MC

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

	Client ID	Lab ID	Matrix	Date
14	KCH067-018	16C070-18	Soil	03/08/16
15	KCH067-016MS	16C070-16MS	Soil	03/08/16
16	KCH067-016MSD	16C070-16MSD	Soil	03/08/16
17				
18				
19				
20				
21				

Notes:

LDC #: 36282A87

VALIDATION FINDINGS CHECKLIST

Reviewer: EZ
2nd Reviewer: fa

Method: Perchlorate (EPA SW 846 Method 6850)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the specified criteria?	✓			
Were the Perchlorate ions within ±0.3 m/z of mass 99,101 and 107?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓		✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit criteria of ≥ 0.990?	✓			
Was the isotope ratio of $^{35}Cl/^{37}Cl$ or m/z 99/101 within 2.3 to 3.8?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 15%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) of the mid-range continuing calibration ≤ 15%?	✓			
Were all percent differences (%D) of the low-range continuing calibration ≤ 50%?	✓			
Was the isotope ratio of $^{35}Cl/^{37}Cl$ or m/z 99/101 within 2.3 to 3.8?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 36282A87

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: FD
2nd Reviewer: AC

Validation Area	Yes	No	NA	Findings/Comments
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?.			✓	
XI. Internal standards				
Were internal standard area counts within ± 50% of the associated calibration standard?	✓			
Were retention times of m/z 89 ($Cl^{18}O_3^-$) within 0.2 minutes of m/z 83 (ClO_3^-)?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within 0.98 to 1.02?	✓			
Was the isotope ratio of $^{35}Cl/^{37}Cl$ or m/z 99/101 within 2.3 to 3.8?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC#: 36282A87
SDG#: pe cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: PD
2nd Reviewer: AL

Method: LCMS Perchlorate (Method 6850)

Calibration Date	System	Compound	Standard	(Y) Response	(X) Concentration
3/3/2016	LCMS	Perchlorate	1	0.092049784	0.1
			2	0.181001406	0.2
			3	0.473018348	0.5
			4	0.958156512	1
			5	1.944112791	2
			6	4.823551117	5
			7	6.972141437	7.5

Regression Output		*Reported*
Constant	*0.022419*	*-0.002295*
Std Err of Y Est		
R Squared	*0.999451*	*0.999500*
Degrees of Freedom		
X Coefficient(s)	*0.937859*	*0.948471*
Std Err of Coef.		
Correlation Coefficient	*0.999725*	
Coefficient of Determination (r^2)	*0.999451*	*0.999500*

LDC #: 36282187

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Reviewer: PR
2nd Reviewer: [illegible]

METHOD: LC/MS Perchlorate (EPA Method 6850)

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

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

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

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	MC23021	3/23/16	Perchlorate	2.0	1.970	1.970	1.5	1.5
	CCV							
2	MC23046	3/24/16	Perchlorate	2.0	2.031	2.031	1.6	1.6
	CCV							
3								

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

LDC #: 36282A87

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: AC

METHOD: LC/MS perchlorate(EPA Method 6850)

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

% Recovery = 100 * (SSR - SR)/SA Where: SSR = Spiked sample result, SR = Sample result
SA = Spike added

RPD = | MSR - MSDR | * 2/(MSR + MSDR) MSR = Matrix spike percent recovery MSDR = Matrix spike duplicate percent recovery

MS/MSD samples: 15 + 16

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		Reported RPD	Recalculated RPD
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	----	----
Perchlorate	4.115	4.115	2.53	7.10	7.04	111	111	110	110	1	1

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

LDC #: 36282187

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: DC

METHOD: LC/MS Perchlorate (EPA Method 6850)

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

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: lcs ID

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCSD		LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Perchlorate	4	4	4.50	4.48	112	112	112	112	0	0

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

LDC #: 36282A87

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer: A

METHOD: LCMS (EPA SW 846 Method 6850)

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

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

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

Example:

Sample I.D. #12, Perchlorate

Conc. = $\frac{\left(\frac{14039}{122932} + 0.00229468\right)(40)}{(0.948471)(2)(0.972)}$

=

2.53 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 11, 2016

Parameters: Volatiles

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C074

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-019	16C074-01	Water	03/08/16
KCH067-021	16C074-02	Water	03/08/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260B

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

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

Average relative response factors (RRF) for all compounds were within validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
02/26/16	tert-Butyl alcohol	0.007 (≥0.01)	All samples in SDG 16C074	UJ (all non-detects)	A

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
03/14/16	tert-Butyl alcohol	0.007 (≥0.01)	All samples in SDG 16C074	UJ (all non-detects)	A

V. Laboratory Blanks

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

VI. Field Blanks

Sample KCH067-021 was identified as a trip blank. No contaminants were found.

Sample KCH067-019 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
KCH067-019	03/08/16	Carbon disulfide	0.40 ug/L	No associated samples in this SDG

Sample KCH067-042 (from SDG 16C129) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
KCH067-042	03/15/16	Acetone	4.1 ug/L	KCH067-019

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated laboratory blanks.

VII. Surrogates

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

VIII. Matrix Spike/Matrix Spike Duplicates

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

IX. Laboratory Control Samples

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

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

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

XII. Compound Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

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

Due to initial calibration and continuing calibration RRF, data were qualified as estimated in two samples.

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

China Lake CTO 067
Volatiles - Data Qualification Summary - SDG 16C074

Sample	Compound	Flag	A or P	Reason (Code)
KCH067-019 KCH067-021	tert-Butyl alcohol	UJ (all non-detects)	A	Initial calibration (RRF) (5)
KCH067-019 KCH067-021	tert-Butyl alcohol	UJ (all non-detects)	A	Continuing calibration (RRF) (5)

China Lake CTO 067
Volatiles - Laboratory Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Volatiles - Field Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

METHOD SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C074	Date Extracted: 03/14/16 20:46
Sample ID: KCH067-019	Date Analyzed: 03/14/16 20:46
Lab Samp ID: C074-01	Dilution Factor: 1
Lab File ID: RCC281	Matrix : WATER
Ext Btch ID: V067C11	% Moisture : NA
Calib. Ref.: RBC337	Instrument ID : 67

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.10	0.20
1,1,1-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.11	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHENE	ND	1.0	0.10	0.20
1,1-DICHLOROPROPENE	ND	1.0	0.10	0.20
1,2,3-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,3-TRICHLOROPROPANE	ND	2.0	0.25	0.50
1,2,4-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,4-TRIMETHYLBENZENE	ND	1.0	0.11	0.20
1,2-DIBROMO-3-CHLOROPROPANE	ND	2.0	0.25	0.50
1,2-DIBROMOETHANE	ND	1.0	0.10	0.20
1,2-DICHLOROBENZENE	ND	1.0	0.10	0.20
1,2-DICHLOROETHANE	ND	1.0	0.10	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.10	0.20
1,3,5-TRIMETHYLBENZENE	ND	1.0	0.13	0.20
1,3-DICHLOROBENZENE	ND	1.0	0.11	0.20
1,3-DICHLOROPROPANE	ND	1.0	0.10	0.20
1,4-DICHLOROBENZENE	ND	1.0	0.10	0.20
2,2-DICHLOROPROPANE	ND	1.0	0.16	0.30
2-BUTANONE	ND	10	2.0	5.0
2-CHLOROTOLUENE	ND	1.0	0.12	0.20
2-HEXANONE	ND	10	2.3	5.0
4-CHLOROTOLUENE	ND	1.0	0.11	0.20
ACETONE	ND	10	2.6	5.0
BENZENE	ND	1.0	0.10	0.20
BROMOBENZENE	ND	1.0	0.10	0.20
BROMOCHLOROMETHANE	ND	1.0	0.11	0.20
BROMODICHLOROMETHANE	ND	1.0	0.10	0.20
BROMOFORM	ND	1.0	0.15	0.30
BROMOMETHANE	ND	1.0	0.16	0.30
CARBON DISULFIDE	0.40J	1.0	0.25	0.50
CARBON TETRACHLORIDE	ND	1.0	0.10	0.20
CHLOROBENZENE	ND	1.0	0.10	0.20
CHLOROETHANE	ND	1.0	0.27	0.30
CHLOROFORM	ND	1.0	0.10	0.20
CHLOROMETHANE	ND	1.0	0.15	0.30
CIS-1,2-DICHLOROETHENE	ND	1.0	0.10	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.10	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.10	0.20
DIBROMOMETHANE	ND	1.0	0.10	0.20
DICHLORODIFLUOROMETHANE	ND	1.0	0.15	0.30
ETHYLBENZENE	ND	1.0	0.10	0.20
HEXACHLOROBUTADIENE	ND	1.0	0.22	0.30
ISOPROPYLBENZENE	ND	1.0	0.10	0.20
M/P-XYLENES	ND	2.0	0.21	0.40
4-METHYL-2-PENTANONE	ND	10	2.1	5.0
METHYLENE CHLORIDE	ND	2.0	0.50	1.0
METHYL TERT-BUTYL ETHER	ND	1.0	0.13	0.20
NAPHTHALENE	ND	2.0	0.50	1.0
N-BUTYLBENZENE	ND	1.0	0.17	0.30
N-PROPYLBENZENE	ND	1.0	0.13	0.20
O-XYLENE	ND	1.0	0.10	0.20
P-ISOPROPYLTOLUENE	ND	1.0	0.14	0.20
SEC-BUTYLBENZENE	ND	1.0	0.13	0.20
STYRENE	ND	1.0	0.25	0.50
TERT-BUTYLBENZENE	ND	1.0	0.13	0.20
TETRACHLOROETHENE	ND	1.0	0.15	0.20
TOLUENE	ND	1.0	0.10	0.20
TRANS-1,2-DICHLOROETHENE	ND	1.0	0.10	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.11	0.20
TRICHLOROETHENE	ND	1.0	0.10	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.15	0.30
VINYL CHLORIDE	ND	1.0	0.12	0.20
TERTIARY BUTYL ALCOHOL	ND UJ(5)	10	2.5	5.0

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	10.0	10.00	100	81-118
4-BROMOFLUOROBENZENE	9.88	10.00	98.8	85-114
TOLUENE-D8	10.1	10.00	101	89-112
DIBROMOFLUOROMETHANE	10.1	10.00	101	80-119

SL 03/16

METHOD SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C074	Date Extracted:	03/14/16 14:24
Sample ID:	KCH067-021	Date Analyzed:	03/14/16 14:24
Lab Samp ID:	C074-02	Dilution Factor:	1
Lab File ID:	RCC266	Matrix	: WATER
Ext Btch ID:	V067C11	% Moisture	: NA
Calib. Ref.:	RBC337	Instrument ID	: 67

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.10	0.20
1,1,1-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.11	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHENE	ND	1.0	0.10	0.20
1,1-DICHLOROPROPENE	ND	1.0	0.10	0.20
1,2,3-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,3-TRICHLOROPROPANE	ND	2.0	0.25	0.50
1,2,4-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,4-TRIMETHYLBENZENE	ND	1.0	0.11	0.20
1,2-DIBROMO-3-CHLOROPROPANE	ND	2.0	0.25	0.50
1,2-DIBROMOETHANE	ND	1.0	0.10	0.20
1,2-DICHLOROBENZENE	ND	1.0	0.10	0.20
1,2-DICHLOROETHANE	ND	1.0	0.10	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.10	0.20
1,3,5-TRIMETHYLBENZENE	ND	1.0	0.13	0.20
1,3-DICHLOROBENZENE	ND	1.0	0.11	0.20
1,3-DICHLOROPROPANE	ND	1.0	0.10	0.20
1,4-DICHLOROBENZENE	ND	1.0	0.10	0.20
2,2-DICHLOROPROPANE	ND	1.0	0.16	0.30
2-BUTANONE	ND	10	2.0	5.0
2-CHLOROTOLUENE	ND	1.0	0.12	0.20
2-HEXANONE	ND	10	2.3	5.0
4-CHLOROTOLUENE	ND	1.0	0.11	0.20
ACETONE	ND	10	2.6	5.0
BENZENE	ND	1.0	0.10	0.20
BROMOBENZENE	ND	1.0	0.10	0.20
BROMOCHLOROMETHANE	ND	1.0	0.11	0.20
BROMODICHLOROMETHANE	ND	1.0	0.10	0.20
BROMOFORM	ND	1.0	0.15	0.30
BROMOMETHANE	ND	1.0	0.16	0.30
CARBON DISULFIDE	ND	1.0	0.25	0.50
CARBON TETRACHLORIDE	ND	1.0	0.10	0.20
CHLOROBENZENE	ND	1.0	0.10	0.20
CHLOROETHANE	ND	1.0	0.27	0.30
CHLOROFORM	ND	1.0	0.10	0.20
CHLOROMETHANE	ND	1.0	0.15	0.30
CIS-1,2-DICHLOROETHENE	ND	1.0	0.10	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.10	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.10	0.20
DIBROMOMETHANE	ND	1.0	0.10	0.20
DICHLORODIFLUOROMETHANE	ND	1.0	0.15	0.30
ETHYLBENZENE	ND	1.0	0.10	0.20
HEXACHLOROBUTADIENE	ND	1.0	0.22	0.30
ISOPROPYLBENZENE	ND	1.0	0.10	0.20
M/P-XYLENES	ND	2.0	0.21	0.40
4-METHYL-2-PENTANONE	ND	10	2.1	5.0
METHYLENE CHLORIDE	ND	2.0	0.50	1.0
METHYL TERT-BUTYL ETHER	ND	1.0	0.13	0.20
NAPHTHALENE	ND	2.0	0.50	1.0
N-BUTYLBENZENE	ND	1.0	0.17	0.30
N-PROPYLBENZENE	ND	1.0	0.13	0.20
O-XYLENE	ND	1.0	0.10	0.20
P-ISOPROPYLTOLUENE	ND	1.0	0.14	0.20
SEC-BUTYLBENZENE	ND	1.0	0.13	0.20
STYRENE	ND	1.0	0.25	0.50
TERT-BUTYLBENZENE	ND	1.0	0.13	0.20
TETRACHLOROETHENE	ND	1.0	0.15	0.20
TOLUENE	ND	1.0	0.10	0.20
TRANS-1,2-DICHLOROETHENE	ND	1.0	0.10	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.11	0.20
TRICHLOROETHENE	ND	1.0	0.10	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.15	0.30
VINYL CHLORIDE	ND	1.0	0.12	0.20
TERTIARY BUTYL ALCOHOL	ND UJ(5)	10	2.5	5.0

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	9.73	10.00	97.3	81-118
4-BROMOFLUOROBENZENE	9.85	10.00	98.5	85-114
TOLUENE-D8	10.1	10.00	101	89-112
DIBROMOFLUOROMETHANE	9.91	10.00	99.1	80-119

8/05/16

LDC #: 36282B1 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C074 Standard Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: EF
2nd Reviewer: AL

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW / A	% RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration / ending CCV	SW	CCV ≤ 20
V.	Laboratory Blanks	A	SB= KCH067-042 (16C129)
VI.	Field blanks	SW	EB= 1 *TB= 2
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	QC Sample
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-019	16C074-01	Water	03/08/16
2	KCH067-021	16C074-02	Water	03/08/16
3				
4				
5				
6				
7				
8				
9				

Notes:

	MBLKIW						

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 36282B 1

VALIDATION FINDINGS WORKSHEET
Initial Calibration

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

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

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

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15 %RSD and ≥0.05 RRF ? cont- 5

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30/15%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	2/26/16	V867B26-ICAL	ZZZ		0.007 (≥0.01)	All	J+/UJ/A (ND)

INICAL.wpd

LDC #: 36282B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

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

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

wdl = 5

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	3/14/16	RCC257-CCV	ZZZ		0.007 (≥0.05)	all	J/UJ/A (ND)

CONCAL.wpd

LDC #: 36282B 1

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: FT
2nd Reviewer: X

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** NA
Sampling date: 3/8/16
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: EB Associated Samples: none

Compound	Blank ID	Sample Identification								
	1									
G	0.40									

Blank units: ug/L **Associated sample units:** ug/L SB = KCH067-042
Sampling date: 3/15/16
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: SB Associated Samples: 1 (ND)

Compound	Blank ID	Sample Identification								
	SB									
F	4.1									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 12, 2016

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C074

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-019	16C074-01	Water	03/08/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270C using Selected Ion Monitoring (SIM)

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

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

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

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

V. Laboratory Blanks

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

VI. Field Blanks

Sample KCH067-019 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 (from SDG 16C129) was identified as a source blank. No contaminants were found.

VII. Surrogates

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

VIII. Matrix Spike/Matrix Spike Duplicates

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

IX. Laboratory Control Samples

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

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

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

XII. Compound Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

METHOD SW3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS SIM

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C074	Date Extracted:	03/14/16 13:45
Sample ID:	KCH067-019	Date Analyzed:	03/16/16 15:33
Lab Samp ID:	C074-01	Dilution Factor:	0.98
Lab File ID:	RCH084	Matrix	: WATER
Ext Btch ID:	SVC011W	% Moisture	: NA
Calib. Ref.:	RAH047	Instrument ID	: T-0E7

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
ACENAPHTHENE	ND	0.49	0.049	0.098
ACENAPHTHYLENE	ND	0.49	0.049	0.098
ANTHRACENE	ND	0.49	0.049	0.098
BENZO(A)ANTHRACENE	ND	0.49	0.088	0.20
BENZO(A)PYRENE	ND	0.49	0.049	0.098
BENZO(B)FLUORANTHENE	ND	0.49	0.049	0.098
BENZO(K)FLUORANTHENE	ND	0.49	0.049	0.098
BENZO(G,H,I)PERYLENE	ND	0.49	0.049	0.098
CHRYSENE	ND	0.49	0.059	0.20
DIBENZO(A,H)ANTHRACENE	ND	0.49	0.049	0.098
FLUORANTHENE	ND	0.49	0.049	0.098
FLUORENE	ND	0.49	0.049	0.098
INDENO(1,2,3-CD)PYRENE	ND	0.49	0.049	0.098
NAPHTHALENE	ND	0.49	0.049	0.098
PHENANTHRENE	ND	0.49	0.049	0.098
PYRENE	ND	0.49	0.049	0.098
2-METHYLNAPHTHALENE	ND	0.49	0.049	0.098
1-METHYLNAPHTHALENE	ND	0.49	0.049	0.098

SURROGATE PARAMETERS	RESULTS	SPK AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	14.0	19.60	71.5	53-106
NITROBENZENE-D5	15.4	19.60	78.3	55-111
TERPHENYL-D14	15.3	19.60	78.2	58-132

3/16

LDC #: 36282B2b **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C074 Standard Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: FJ
2nd Reviewer: JL

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A /A	%RSD ≤ 15, r² ICV ≤ 20
IV.	Continuing calibration /ending CCV	A	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = 1 SB = KCH067-042 (16C129)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	QC sample
IX.	Laboratory control samples	A	Lab ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-019	16C074-01	Water	03/08/16
2				
3				
4				
5				
6				
7				
8				
9				

Notes:

	MBLK1W						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 12, 2016

Parameters: Chlorinated Pesticides

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C074

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-019	16C074-01	Water	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8081A

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance 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 and Initial Calibration Verification

An 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.

The percent differences (%D) of the initial calibration verification (ICV) standard 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 with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
03/15/16	CCV	RTX-CLP2	alpha-BHC gamma-BHC delta-BHC	28 21 21	All samples in SDG 16C074	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A

V. Laboratory Blanks

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

VI. Field Blanks

Sample KCH067-019 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 (from SDG 16C129) was identified as a source blank. No contaminants were found.

VII. Surrogates

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

VIII. Matrix Spike/Matrix Spike Duplicates

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

IX. Laboratory Control Samples

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

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Compound Quantitation

Raw data were not reviewed for Level III validation.

XII. Target Compound Identification

Raw data were not reviewed for Level III validation.

XIII. System Performance

Raw data were not reviewed for Level III validation.

XIII. Overall Assessment of Data

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

Due to continuing calibration %D, data were qualified as estimated in one sample.

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

China Lake CTO 067
Chlorinated Pesticides - Data Qualification Summary - SDG 16C074

Sample	Compound	Flag	A or P	Reason (Code)
KCH067-019	alpha-BHC gamma-BHC delta-BHC	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D) (5)

China Lake CTO 067
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

METHOD SW3520C/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C074	Date Extracted: 03/14/16 11:45
Sample ID: KCH067-019	Date Analyzed: 03/15/16 15:50
Lab Samp ID: C074-01	Dilution Factor: 1
Lab File ID: RC15012A	Matrix : WATER
Ext Btch ID: CPC010W	% Moisture : NA
Calib. Ref.: RC15005A	Instrument ID : F9

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
ALPHA-BHC	(ND) | ND UJ(S)	0.10	0.0050	0.010
GAMMA-BHC (LINDANE)	(ND) | ND ↓	0.10	0.0050	0.010
BETA-BHC	(ND) | ND	0.10	0.0070	0.010
HEPTACHLOR	(ND) | ND	0.10	0.0070	0.010
DELTA-BHC	(ND) | ND UJ(S)	0.10	0.0070	0.010
ALDRIN	(ND) | ND	0.10	0.0050	0.010
HEPTACHLOR EPOXIDE	(ND) | ND	0.10	0.0050	0.010
GAMMA-CHLORDANE	(ND) | ND	0.10	0.0050	0.010
ALPHA-CHLORDANE	(ND) | ND	0.10	0.0050	0.010
ENDOSULFAN I	(ND) | ND	0.10	0.0080	0.010
4,4'-DDE	(ND) | ND	0.10	0.0050	0.010
DIELDRIN	(ND) | ND	0.10	0.0050	0.010
ENDRIN	(ND) | ND	0.10	0.0080	0.010
4,4'-DDD	(ND) | ND	0.10	0.0050	0.010
ENDOSULFAN II	(ND) | ND	0.10	0.0050	0.010
4,4'-DDT	(ND) | ND	0.10	0.0050	0.010
ENDRIN ALDEHYDE	(ND) | ND	0.10	0.0050	0.010
ENDOSULFAN SULFATE	(ND) | ND	0.10	0.0050	0.010
ENDRIN KETONE	(ND) | ND	0.10	0.0050	0.010
METHOXYCHLOR	(ND) | ND	1.0	0.050	0.10
TOXAPHENE	(ND) | ND	2.0	0.25	0.50
TECHNICAL CHLORDANE	(ND) | ND	1.0	0.25	0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.3390 | (0.4145)	0.4000	84.8 | (104)	44-124

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

Note: Technical Chlordane result was reported from analysis run data file ID RC22008 associated with calibration file ID RC22005.

4/07/16

LDC #: 36282B3a
SDG #: 16C074
Laboratory: EMAX Laboratories Inc.

VALIDATION COMPLETENESS WORKSHEET
Standard

Date: 5/9/16
Page: 1 of 1
Reviewer: FD
2nd Reviewer: R

METHOD: GC Chlorinated Pesticides (EPA SW846 Method 8081A)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC Instrument Performance Check	A	
III.	Initial calibration/ICV	A / A	%RSD/ICV ≤ 20
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = 1 SB= KCH067-042 (16C129)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	QC sample
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Compound quantitation/RL/LOQ/LODs	N	
XII.	Target compound identification	N	
XIII.	System Performance	N	
XIV.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-019	16C074-01	Water	03/08/16
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

Notes:

	MBLKW						

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPA SW 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. Arochlor 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:_____

LDC #: 36282B3a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: FT
2nd Reviewer: PR

METHOD: ✓ **GC** __ **HPLC**

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? ___%D or ___%R
Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / %R validation criteria of ≤20.0% / 80-120%?
Level IV Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

cont = 5

#	Date	Standard ID	Detector/ Column	Compound	%D (Limit ≤ 20.0)	RT (limit)	Associated Samples	Qualifications
	3/15/16	RC15005B-CCV	RTX-CLP2	A	28		All	J/UJ/A ND
				D	21		↓	↓
				C	21		↓	↓

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 11, 2016

Parameters: Polychlorinated Biphenyls

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C074

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-019	16C074-01	Water	03/08/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An 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.

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

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.

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-019 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 (from SDG 16C129) was identified as a source blank. No contaminants were found.

VI. Surrogates

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

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level III validation.

XI. Target Compound Identification

Raw data were not reviewed for Level III validation.

XII. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Polychlorinated Biphenyls - Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

METHOD SW3520C/8082
PCBs

Client : KLEINFELDER	Date Collected: 03/08/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/10/16
Batch No. : 16C074	Date Extracted: 03/14/16 11:45
Sample ID: KCH067-019	Date Analyzed: 03/15/16 14:12
Lab Samp ID: C074-01	Dilution Factor: 1
Lab File ID: SC15016A	Matrix : WATER
Ext Btch ID: CPC010W	% Moisture : NA
Calib. Ref.: SC15002A	Instrument ID : GCT008

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
AROCLOR 1016	(ND)|ND	1.0	0.45	0.50
AROCLOR 1221	(ND)|ND	1.0	0.29	0.50
AROCLOR 1232	(ND)|ND	1.0	0.25	0.50
AROCLOR 1242	(ND)|ND	1.0	0.25	0.50
AROCLOR 1248	(ND)|ND	1.0	0.25	0.50
AROCLOR 1254	(ND)|ND	1.0	0.25	0.50
AROCLOR 1260	(ND)|ND	1.0	0.31	0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.3434|(0.3751)	0.4000	85.8|(93.8)	60-130

Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )
* Out side of QC Limit

3/15/16

LDC #: 36282B3b
SDG #: 16C074
Laboratory: EMAX Laboratories Inc.

VALIDATION COMPLETENESS WORKSHEET
Standard

Date: 5/9/16
Page: 1 of 1
Reviewer: EF
2nd Reviewer: IK

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%D/ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB = 1 SB = KCH067-042 (16C129)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	QC sample
VIII.	Laboratory control samples	A	LCS ID
IX.	Field duplicates	N	
X.	Compound quantitation/RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-019	16C074-01	Water	03/08/16
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

	MBLKW						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 13, 2016

Parameters: Metals

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C074

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-019	16C074-01	Water	03/08/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A
Mercury by EPA SW 846 Method 7470A

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

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

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

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

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Laboratory Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Iron	5.17 ug/L	All samples in SDG 16C074

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
KCH067-019	Iron	9.85 ug/L	10.0U ug/L

VI. Field Blanks

Sample KCH067-019 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
KCH067-019	03/08/16	Boron Calcium Iron Lead Manganese Nickel Sodium	4.65 ug/L 135 ug/L 9.85 ug/L 0.225 ug/L 0.318 ug/L 0.161 ug/L 42.6 ug/L	No associated samples in this SDG

Sample KCH067-042 (from SDG 16C129) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
KCH067-042	03/15/16	Barium Boron Calcium Chromium Copper Lead Magnesium Sodium	0.277 ug/L 4.00 ug/L 34.7 ug/L 0.101 ug/L 0.811 ug/L 0.0528 ug/L 7.51 ug/L 35.3 ug/L	All samples in SDG 16C074

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
KCH067-019	Boron Lead Sodium	4.65 ug/L 0.225 ug/L 42.6 ug/L	5.00U ug/L 0.225U ug/L 50.0U ug/L

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Duplicate Sample Analysis

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

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. The analysis criteria were met.

X. Laboratory Control Samples

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

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

XIII. Sample Result Verification

Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

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

Due to laboratory blank contamination, data were qualified as not detected in one sample.

Due to source blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

China Lake CTO 067
Metals - Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Metals - Laboratory Blank Data Qualification Summary - SDG 16C074

Sample	Analyte	Modified Final Concentration	A or P	Code
KCH067-019	Iron	10.0U ug/L	A	7

China Lake CTO 067
Metals - Field Blank Data Qualification Summary - SDG 16C074

Sample	Analyte	Modified Final Concentration	A or P	Code
KCH067-019	Boron Lead Sodium	5.00U ug/L 0.225U ug/L 50.0U ug/L	A	6

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
SDG NO.	: 16C074	Date Extracted:	03/16/16 11:07
Sample ID:	KCH067-019	Date Analyzed:	03/24/16 12:39
Lab Samp ID:	C074-01	Dilution Factor:	1
Lab File ID:	F6C08022	Matrix :	WATER
Ext Btch ID:	IMC027W	% Moisture :	NA
Calib. Ref.:	F6C08016	Instrument ID :	T-IF6

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Aluminum	ND	100	10.0	20.0
Antimony	ND	1.00	0.250	0.500
Arsenic	ND	1.00	0.100	0.200
Barium	ND	1.00	0.250	0.500
Beryllium	ND	1.00	0.0500	0.100
Boron	4.65J 5.00 U	10.0 (6)	2.50	5.00
Cadmium	ND	1.00	0.100	0.200
Calcium	135	100	13.0	25.0
Chromium	ND	1.00	0.100	0.200
Cobalt	ND	1.00	0.100	0.200
Copper	ND	1.00	0.250	0.500
Iron	9.85J 10.0 U	100 (7)	5.00	10.0
Lead	0.225J U	1.00 (6)	0.0500	0.100
Magnesium	ND	100	5.00	10.0
Manganese	0.318J	1.00	0.100	0.200
Molybdenum	ND	2.00	0.250	0.500
Nickel	0.161J	1.00	0.100	0.200
Potassium	ND	100	10.0	20.0
Selenium	ND	1.00	0.150	0.300
Silver	ND	1.00	0.100	0.200
Sodium	42.6J 50.0 U	100 (6)	25.0	50.0
Thallium	ND	1.00	0.100	0.200
Vanadium	ND	1.00	0.250	0.500
Zinc	ND	20.0	5.00	10.0

5/17/16

METHOD SW7470A
MERCURY BY COLD VAPOR

Client : KLEINFELDER
Project : NAWS CHINA LAKE, CTO 067
Batch No. : 16C074

Matrix : WATER
InstrumentID : 47

CLIENT SAMPLE ID	EMAX SAMPLE ID	RESULTS (ug/L)	DIL'N FACTOR	MOIST (%)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1W	HGC014WB	ND	1	NA	0.50	0.050	0.10	03/23/1610:11	03/22/1616:30	M47C011011	M47C011	HGC014W	NA	NA
LCS1W	HGC014WL	2.38	1	NA	0.50	0.050	0.10	03/23/1610:13	03/22/1616:30	M47C011012	M47C011	HGC014W	NA	NA
LCD1W	HGC014WC	2.40	1	NA	0.50	0.050	0.10	03/23/1610:15	03/22/1616:30	M47C011013	M47C011	HGC014W	NA	NA
KCH067-019	C074-01	ND	1	NA	0.50	0.050	0.10	03/23/1610:42	03/22/1616:30	M47C011025	M47C011	HGC014W	03/08/1617:35	03/10/16

LDC #: 36282B4a
SDG #: 16C074
Laboratory: EMAX Laboratories Inc.

VALIDATION COMPLETENESS WORKSHEET
Standard

Date: 5/10/16
Page: 1 of 1
Reviewer: JD
2nd Reviewer: M

METHOD: Metals (EPA SW 846 Method 6020A/7470A)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	03/08/16
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB= (-); SB=KCH067-042 (SDG: 16C129)
VII.	Matrix Spike/Matrix Spike Duplicates	N	CS
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS/D
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	Not Reviewed
XIII.	Sample Result Verification	N	
XIV.	Overall Assessment of Data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-019	16C074-01	Water	03/08/16
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

LDC #: 36282B4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

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

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 36282B4a

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: JD
2nd Reviewer: AC

METHOD: Metals (EPA SW 864 Method 6010/6020/7000) Soil preparation factor applied: ____
Sample Concentration units, unless otherwise noted: ug/L Associated Samples: All (or)

					Sample Identification									
Analyte	**Maximum PB[a] (mg/Kg)**	**Maximum PB[a] (ug/L)**	**Maximum ICB/CCB[a] (ug/L)**	**Blank Action Limit**	1									
Fe			5.17		9.85/~~100~~ 10.0 U									

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.

LDC #: 36282B4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: JD
2nd Reviewer: AK

METHOD: Trace Metals (EPA Method 200.7/200.8)

Blank units: ug/L **Associated sample units:** mg/kg
Sampling date: 03/08/16 Soil factor applied ~~50X~~
Field blank type: (circle one) Field Blank / Rinsate / Other: (EB) Associated Samples: None (06)

Analyte	Blank ID	Sample Identification											
	1	Action Limit	No Qual.										
B	4.65												
Ca	135	67.5											
Fe	9.85												
Pb	0.225												
Mn	0.318												
Ni	0.161												
Na	42.6												

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 03/15/16 Soil factor applied
Field blank type: (circle one) Field Blank / Rinsate / Other: (SB) Associated Samples: All (06)

Analyte	Blank ID	Sample Identification											
	KCH067-042 (SDG:16C129)	Action Limit	1										
Ba	0.277												
B	4.00		4.65/~~10.0~~										
Ca	34.7												
Cr	0.101												
Cu	0.811												
Pb	0.0528		0.225/~~1.00~~										
Mg	7.51												
Na	35.3		42.6/~~100~~										

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 12, 2016

Parameters: Hexavalent Chromium

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C074

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-019	16C074-01	Water	03/08/16
KCH067-019MS	16C074-01MS	Water	03/08/16
KCH067-019MSD	16C074-01MSD	Water	03/08/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7199

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-019 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 (from SDG 16C129) was identified as a source blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

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

VII. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Hexavalent Chromium - Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

METHOD SW7199
HEXAVALENT CHROMIUM

Client : KLEINFELDER
Project : NAWS CHINA LAKE, CTO 067
Batch No. : 16C074

Matrix : WATER
InstrumentID : 59

CLIENT SAMPLE ID	EMAX SAMPLE ID	RESULTS (ug/L)	DIL'N. FACTOR	MOIST (%)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1W	HCC005WB	ND	1	NA	0.2	0.05	0.1	03/15/1616:18	03/15/1616:10	IC15003	IC15001	HCC005W	NA	NA
LCS1W	HCC005WL	1.90	1	NA	0.2	0.05	0.1	03/15/1616:38	03/15/1616:10	IC15005	IC15001	HCC005W	NA	NA
LCD1W	HCC005WC	1.98	1	NA	0.2	0.05	0.1	03/15/1616:59	03/15/1616:10	IC15007	IC15001	HCC005W	NA	NA
KCH067-019	C074-01	ND	1	NA	0.2	0.05	0.1	03/15/1617:20	03/15/1616:10	IC15009	IC15001	HCC005W	03/08/1617:35	03/10/16
KCH067-019MS	C074-01M	1.10	1	NA	0.2	0.05	0.1	03/15/1618:02	03/15/1616:10	IC15013	IC15011	HCC005W	03/08/1617:35	03/10/16
KCH067-019MSD	C074-01S	1.01	1	NA	0.2	0.05	0.1	03/15/1618:22	03/15/1616:10	IC15015	IC15011	HCC005W	03/08/1617:35	03/10/16

t05/17/16

LDC #: 36282B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16
SDG #: 16C074 Standard Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: JD
2nd Reviewer: [illegible]

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7199)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	3/8/16 *
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	EB=(1); SB=KCH067-042(SDG.16C129)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(2,3)
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-019	16C074-01	Water	03/08/16
2	KCH067-019MS	16C074-01MS	Water	03/08/16
3	KCH067-019MSD	16C074-01MSD	Water	03/08/16
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes: *preserved with ammonium buffer per email

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 11, 2016

Parameters: Total Petroleum Hydrocarbons as Gasoline

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C074

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-019	16C074-01	Water	03/08/16
KCH067-021	16C074-02	Water	03/08/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Gasoline by Environmental Protection Agency (EPA) SW 846 Method 8015B

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An 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.

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

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-021 was identified as a trip blank. No contaminants were found.

Sample KCH067-019 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 (from SDG 16C129) was identified as a source blank. No contaminants were found.

VI. Surrogates

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

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level III validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level III validation.

XII. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Total Petroleum Hydrocarbons as Gasoline - Field Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

METHOD SW5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C074	Date Extracted:	03/16/16 14:42
Sample ID	: KCH067-019	Date Analyzed:	03/16/16 14:42
Lab Samp ID	: C074-01	Dilution Factor:	1
Lab File ID	: EC16008A	Matrix	: WATER
Ext Btch ID	: VG39C08	% Moisture	: NA
Calib. Ref.	: EC16003A	Instrument ID	: GCT039

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
GASOLINE	ND	0.10	0.010	0.020

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	0.0329	0.04000	82.2	69-133

Parameter	H-C Range
Gasoline	C6-C10

SCT 3/17/16

METHOD SW5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C074	Date Extracted:	03/16/16 15:21
Sample ID	: KCH067-021	Date Analyzed:	03/16/16 15:21
Lab Samp ID	: C074-02	Dilution Factor:	1
Lab File ID	: EC16009A	Matrix	: WATER
Ext Btch ID	: VG39C08	% Moisture	: NA
Calib. Ref.	: EC16003A	Instrument ID	: GCT039

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
GASOLINE	ND	0.10	0.010	0.020

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	0.0304	0.04000	76.1	69-133

Parameter	H-C Range
Gasoline	C6-C10

3/5/16

LDC #: 36282B7 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C074 Standard Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC TPH as Gasoline (EPA SW 846 Method 8015B)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	Initial calibration/ICV	A /A	
III.	Continuing calibration	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB = 1 TB = 2
VI.	Surrogate spikes	A	SB= KCH067-042 (SDG 16C129)
VII.	Matrix spike/Matrix spike duplicates	N	QC sample
VIII.	Laboratory control samples	A	LCS ID
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-019	16C074-01	Water	03/08/16
2	KCH067-021	16C074-02	Water	03/08/16
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

	MBLK1W						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 13, 2016

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C074

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-019	16C074-01	Water	03/08/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An 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.

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

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-019 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 (from SDG 16C129) was identified as a source blank. No contaminants were found.

VI. Surrogates

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

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level III validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level III validation.

XII. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

METHOD SW3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C074	Date Extracted:	03/14/16 12:00
Sample ID:	KCH067-019	Date Analyzed:	03/15/16 14:14
Lab Samp ID:	C074-01	Dilution Factor:	0.94
Lab File ID:	LC15009A	Matrix :	WATER
Ext Btch ID:	DSC011W	% Moisture :	NA
Calib. Ref.:	LC15004A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
DIESEL	ND	0.47	0.047	0.094
JP-5	ND	0.47	0.047	0.094
MOTOR OIL	ND	0.47	0.047	0.094

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	0.957	0.9400	102	60-130
HEXACOSANE	0.253	0.2350	108	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/17/16

LDC #: 36282B8 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C074 Standard Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	Initial calibration/ICV	A/A	%RSD/ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB = 1 SB = KCH067-042 (SDG # 16C129)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS ID
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-019	16C074-01	Water	03/08/16
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

	MBLK1W						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 11, 2016

Parameters: Explosives

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C074

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-019	16C074-01	Water	03/08/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Explosives by Environmental Protection Agency (EPA) SW 846 Method 8330A

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An 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.

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

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

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

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-019 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 (from SDG 16C129) was identified as a source blank. No contaminants were found.

VI. Surrogates

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

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level III validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level III validation.

XII. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Explosives - Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Explosives - Laboratory Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Explosives - Field Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/08/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/10/16
Batch No.	: 16C074	Date Extracted:	03/11/16 12:40
Sample ID	: KCH067-019	Date Analyzed:	03/14/16 23:57
Lab Samp ID	: C074-01	Dilution Factor:	1
Lab File ID	: XC14021A	Matrix	: WATER
Ext Btch ID	: EXC004W	% Moisture	: NA
Calib. Ref.	: XC14014A	Instrument ID	: T-081

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
HMX	ND	1.0	0.10	0.20
RDX	ND	1.0	0.16	0.40
1,3,5-TNB	ND	1.0	0.10	0.20
1,3-DNB	ND	1.0	0.10	0.20
TETRYL	ND	1.0	0.10	0.20
NITROBENZENE	ND	1.0	0.10	0.20
2,4,6-TNT	ND	1.0	0.16	0.40
4-AM-2,6-DNT	ND	1.0	0.20	0.20
2-AM-4,6-DNT	ND	1.0	0.10	0.20
2,6-DNT	ND	1.0	0.10	0.20
2,4-DNT	ND	1.0	0.12	0.20
2-NITROTOLUENE	ND	1.0	0.11	0.20
3-NITROTOLUENE	ND	1.0	0.16	0.40
4-NITROTOLUENE	ND	1.0	0.10	0.20

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	4.07	4.000	102	60-140

Note: All positive results are confirmed by Biphenyl column

3/15/16

LDC #: 36282B40 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C074 Standard Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: F
2nd Reviewer: F

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.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%RSD ≤ 20 ICV ≤ 15
III.	Continuing calibration	A	CCV ≤ 15
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB = 1 SB = KCH067-042 (SDG 16C129)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	QC sample
VIII.	Laboratory control samples	A	LCS ID
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-019	16C074-01	Water	03/08/16
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Notes:

	MBLK 1W						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 12, 2016

Parameters: Perchlorate

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C074

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-019	16C074-01	Water	03/08/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Perchlorate by Environmental Protection Agency (EPA) SW 846 Method 6850

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance check was performed prior to initial calibration.

All perchlorate ion signal to noise ratio requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

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

The isotope ratios were within QC limits.

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 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%.

The isotope ratios were within QC limits.

V. Laboratory Blanks

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

VI. Field Blanks

Sample KCH067-019 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 (from SDG 16C129) was identified as a source blank. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

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

XI. Compound Quantitation

Raw data were not reviewed for Level III validation.

XII. Target Compound Identifications

Raw data were not reviewed for Level III validation.

XIII. System Performance

Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Perchlorate - Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Perchlorate - Laboratory Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

China Lake CTO 067
Perchlorate - Field Blank Data Qualification Summary - SDG 16C074

No Sample Data Qualified in this SDG

METHOD SW6850
PERCHLORATE

Client : KLEINFELDER
Project : NAWS CHINA LAKE, CTO 067
Batch No. : 16C074

Matrix : WATER
InstrumentID : GO

Client SAMPLE ID	EMAX SAMPLE ID	RESULT (ug/L)	DIL'N. FACTOR	MOIST (%)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1W	PLC006WB	ND	1	NA	0.5	0.1	0.2	03/23/1611:28	NA	16MC23007	MC23004	16PLC006W	NA	NA
LCS1W	PLC006WL	0.588	1	NA	0.5	0.1	0.2	03/23/1611:45	NA	16MC23008	MC23004	16PLC006W	NA	NA
LCD1W	PLC006WC	0.550	1	NA	0.5	0.1	0.2	03/23/1611:59	NA	16MC23009	MC23004	16PLC006W	NA	NA
KCH067-019	C074-01	ND	1	NA	0.5	0.1	0.2	03/23/1612:14	NA	16MC23010	MC23004	16PLC006W	03/08/1617:35	03/10/16

4/05/17/16

LDC #: 36282B87 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/9/16
SDG #: 16C074 Standard Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: PD
2nd Reviewer: R

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.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	auto tune
III.	Initial calibration/ICV	A/A	r^2 ICV ≤ 15
IV.	Continuing calibration	A	CCV ≤ 15 LODV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = 1 SB= KCH067-042 (SDG 16C129)
VII.	Surrogate spikes	N	not required
VIII.	Matrix spike/Matrix spike duplicates	N	QC sample
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-019	16C074-01	Water	03/08/16
2				
3				
4				
5				
6				
7				
8				
9				

Notes:

	MBLK1W						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 11, 2016

Parameters: Volatiles

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C129

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-042	16C129-19	Water	03/15/16
KCH067-043	16C129-20	Water	03/15/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260B

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

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

Average relative response factors (RRF) for all compounds were within validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
02/26/16	tert-Butyl alcohol	0.007 (≥0.01)	All samples in SDG 16C129	UJ (all non-detects)	A

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
03/22/16	tert-Butyl alcohol	0.007 (≥0.01)	All samples in SDG 16C129	UJ (all non-detects)	A

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analysis Date	Compound	Concentration	Associated Samples
MBLK1W	03/22/16	Methylene chloride	0.91 ug/L	All samples in SDG 16C129

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

Sample KCH067-043 was identified as a trip blank. No contaminants were found.

Sample KCH067-042 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
KCH067-042	03/15/16	Acetone	4.1 ug/L	No associated samples in this SDG

VII. Surrogates

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

VIII. Matrix Spike/Matrix Spike Duplicates

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

IX. Laboratory Control Samples

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

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

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

XII. Compound Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

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

Due to initial calibration and continuing calibration RRF, data were qualified as estimated in two samples.

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

China Lake CTO 067
Volatiles - Data Qualification Summary - SDG 16C129

Sample	Compound	Flag	A or P	Reason (Code)
KCH067-042 KCH067-043	tert-Butyl alcohol	UJ (all non-detects)	A	Initial calibration (RRF) (5)
KCH067-042 KCH067-043	tert-Butyl alcohol	UJ (all non-detects)	A	Continuing calibration (RRF) (5)

China Lake CTO 067
Volatiles - Laboratory Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Volatiles - Field Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

METHOD SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/22/16 15:34
Sample ID: KCH067-042	Date Analyzed: 03/22/16 15:34
Lab Samp ID: C129-19N	Dilution Factor: 1
Lab File ID: RCC442	Matrix : WATER
Ext Btch ID: V067C17	% Moisture : NA
Calib. Ref.: RBC337	Instrument ID : 67

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.10	0.20
1,1,1-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.11	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHENE	ND	1.0	0.10	0.20
1,1-DICHLOROPROPENE	ND	1.0	0.10	0.20
1,2,3-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,3-TRICHLOROPROPANE	ND	2.0	0.25	0.50
1,2,4-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,4-TRIMETHYLBENZENE	ND	1.0	0.11	0.20
1,2-DIBROMO-3-CHLOROPROPANE	ND	2.0	0.25	0.50
1,2-DIBROMOETHANE	ND	1.0	0.10	0.20
1,2-DICHLOROBENZENE	ND	1.0	0.10	0.20
1,2-DICHLOROETHANE	ND	1.0	0.10	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.10	0.20
1,3,5-TRIMETHYLBENZENE	ND	1.0	0.13	0.20
1,3-DICHLOROBENZENE	ND	1.0	0.11	0.20
1,3-DICHLOROPROPANE	ND	1.0	0.10	0.20
1,4-DICHLOROBENZENE	ND	1.0	0.10	0.20
2,2-DICHLOROPROPANE	ND	1.0	0.16	0.30
2-BUTANONE	ND	10	2.0	5.0
2-CHLOROTOLUENE	ND	1.0	0.12	0.20
2-HEXANONE	ND	10	2.3	5.0
4-CHLOROTOLUENE	ND	1.0	0.11	0.20
ACETONE	4.1J	10	2.6	5.0
BENZENE	ND	1.0	0.10	0.20
BROMOBENZENE	ND	1.0	0.10	0.20
BROMOCHLOROMETHANE	ND	1.0	0.11	0.20
BROMODICHLOROMETHANE	ND	1.0	0.10	0.20
BROMOFORM	ND	1.0	0.15	0.30
BROMOMETHANE	ND	1.0	0.16	0.30
CARBON DISULFIDE	ND	1.0	0.25	0.50
CARBON TETRACHLORIDE	ND	1.0	0.10	0.20
CHLOROBENZENE	ND	1.0	0.10	0.20
CHLOROETHANE	ND	1.0	0.27	0.30
CHLOROFORM	ND	1.0	0.10	0.20
CHLOROMETHANE	ND	1.0	0.15	0.30
CIS-1,2-DICHLOROETHENE	ND	1.0	0.10	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.10	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.10	0.20
DIBROMOMETHANE	ND	1.0	0.10	0.20
DICHLORODIFLUOROMETHANE	ND	1.0	0.15	0.30
ETHYLBENZENE	ND	1.0	0.10	0.20
HEXACHLOROBUTADIENE	ND	1.0	0.22	0.30
ISOPROPYLBENZENE	ND	1.0	0.10	0.20
M/P-XYLENES	ND	2.0	0.21	0.40
4-METHYL-2-PENTANONE	ND	10	2.1	5.0
METHYLENE CHLORIDE	ND	2.0	0.50	1.0
METHYL TERT-BUTYL ETHER	ND	1.0	0.13	0.20
NAPHTHALENE	ND	2.0	0.50	1.0
N-BUTYLBENZENE	ND	1.0	0.17	0.30
N-PROPYLBENZENE	ND	1.0	0.13	0.20
O-XYLENE	ND	1.0	0.10	0.20
P-ISOPROPYLTOLUENE	ND	1.0	0.14	0.20
SEC-BUTYLBENZENE	ND	1.0	0.13	0.20
STYRENE	ND	1.0	0.25	0.50
TERT-BUTYLBENZENE	ND	1.0	0.13	0.20
TETRACHLOROETHENE	ND	1.0	0.15	0.20
TOLUENE	ND	1.0	0.10	0.20
TRANS-1,2-DICHLOROETHENE	ND	1.0	0.10	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.11	0.20
TRICHLOROETHENE	ND	1.0	0.10	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.15	0.30
VINYL CHLORIDE	ND	1.0	0.12	0.20
TERTIARY BUTYL ALCOHOL	ND UJ(S)	10	2.5	5.0

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	9.56	10.00	95.6	81-118
4-BROMOFLUOROBENZENE	9.53	10.00	95.3	85-114
TOLUENE-D8	9.73	10.00	97.3	89-112
DIBROMOFLUOROMETHANE	9.93	10.00	99.3	80-119

5/5/16

METHOD SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/22/16 16:00
Sample ID: KCH067-043	Date Analyzed: 03/22/16 16:00
Lab Samp ID: C129-20N	Dilution Factor: 1
Lab File ID: RCC443	Matrix : WATER
Ext Btch ID: V067C17	% Moisture : NA
Calib. Ref.: RBC337	Instrument ID : 67

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.10	0.20
1,1,1-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.11	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHENE	ND	1.0	0.10	0.20
1,1-DICHLOROPROPENE	ND	1.0	0.10	0.20
1,2,3-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,3-TRICHLOROPROPANE	ND	2.0	0.25	0.50
1,2,4-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,4-TRIMETHYLBENZENE	ND	1.0	0.11	0.20
1,2-DIBROMO-3-CHLOROPROPANE	ND	2.0	0.25	0.50
1,2-DIBROMOETHANE	ND	1.0	0.10	0.20
1,2-DICHLOROBENZENE	ND	1.0	0.10	0.20
1,2-DICHLOROETHANE	ND	1.0	0.10	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.10	0.20
1,3,5-TRIMETHYLBENZENE	ND	1.0	0.13	0.20
1,3-DICHLOROBENZENE	ND	1.0	0.11	0.20
1,3-DICHLOROPROPANE	ND	1.0	0.10	0.20
1,4-DICHLOROBENZENE	ND	1.0	0.10	0.20
2,2-DICHLOROPROPANE	ND	1.0	0.16	0.30
2-BUTANONE	ND	10	2.0	5.0
2-CHLOROTOLUENE	ND	1.0	0.12	0.20
2-HEXANONE	ND	10	2.3	5.0
4-CHLOROTOLUENE	ND	1.0	0.11	0.20
ACETONE	ND	10	2.6	5.0
BENZENE	ND	1.0	0.10	0.20
BROMOBENZENE	ND	1.0	0.10	0.20
BROMOCHLOROMETHANE	ND	1.0	0.11	0.20
BROMODICHLOROMETHANE	ND	1.0	0.10	0.20
BROMOFORM	ND	1.0	0.15	0.30
BROMOMETHANE	ND	1.0	0.16	0.30
CARBON DISULFIDE	ND	1.0	0.25	0.50
CARBON TETRACHLORIDE	ND	1.0	0.10	0.20
CHLOROBENZENE	ND	1.0	0.10	0.20
CHLOROETHANE	ND	1.0	0.27	0.30
CHLOROFORM	ND	1.0	0.10	0.20
CHLOROMETHANE	ND	1.0	0.15	0.30
CIS-1,2-DICHLOROETHENE	ND	1.0	0.10	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.10	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.10	0.20
DIBROMOMETHANE	ND	1.0	0.10	0.20
DICHLORODIFLUOROMETHANE	ND	1.0	0.15	0.30
ETHYLBENZENE	ND	1.0	0.10	0.20
HEXACHLOROBUTADIENE	ND	1.0	0.22	0.30
ISOPROPYLBENZENE	ND	1.0	0.10	0.20
M/P-XYLENES	ND	2.0	0.21	0.40
4-METHYL-2-PENTANONE	ND	10	2.1	5.0
METHYLENE CHLORIDE	ND	2.0	0.50	1.0
METHYL TERT-BUTYL ETHER	ND	1.0	0.13	0.20
NAPHTHALENE	ND	2.0	0.50	1.0
N-BUTYLBENZENE	ND	1.0	0.17	0.30
N-PROPYLBENZENE	ND	1.0	0.13	0.20
O-XYLENE	ND	1.0	0.10	0.20
P-ISOPROPYLTOLUENE	ND	1.0	0.14	0.20
SEC-BUTYLBENZENE	ND	1.0	0.13	0.20
STYRENE	ND	1.0	0.25	0.50
TERT-BUTYLBENZENE	ND	1.0	0.13	0.20
TETRACHLOROETHENE	ND	1.0	0.15	0.20
TOLUENE	ND	1.0	0.10	0.20
TRANS-1,2-DICHLOROETHENE	ND	1.0	0.10	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.11	0.20
TRICHLOROETHENE	ND	1.0	0.10	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.15	0.30
VINYL CHLORIDE	ND	1.0	0.12	0.20
TERTIARY BUTYL ALCOHOL	ND UJ(S)	10	2.5	5.0

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	9.62	10.00	96.2	81-118
4-BROMOFLUOROBENZENE	9.54	10.00	95.4	85-114
TOLUENE-D8	9.69	10.00	97.0	89-112
DIBROMOFLUOROMETHANE	9.95	10.00	99.5	80-119

8/25/16

LDC #: 36282C1 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16
SDG #: 16C129 Standard Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: FJ
2nd Reviewer: AC

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW A	%D RSD ≤ 15 ICV ≤ 20
IV.	Continuing calibration / ending ccv	SW	ccv ≤ 20
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	SB = 1 TB = 2*
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	QC Sample
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-042 SB	16C129-19	Water	03/15/16
2	KCH067-043 TB	16C129-20	Water	03/15/16
3				
4				
5				
6				
7				
8				
9				

Notes:

	MBLKIW						

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 36282C1

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer: AC

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

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

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15 %RSD and ≥0.05 RRF ?

Code = 5

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30/15%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	2/26/16	V067B26-ICAL	ZZZ		0.007 (≥0.01)	all	J+/UJ/A ND

INICAL.wpd

LDC #: 36202C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

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

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

Code = J

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	3/22/16	RCC434-CCV	ZZZ		0.007 (≥0.01)	all	J+ / UJ / A NB

LDC #: 36282 C1

VALIDATION FINDINGS WORKSHEET
Blanks

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

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 3/22/16
Conc. units: ug/L Associated Samples: All (ND)

Compound	Blank ID	Sample Identification								
	MBLK1W									
F	0.91									

Blank analysis date:
Conc. units: Associated Samples:

Compound	Blank ID	Sample Identification								

All results were qualified using the criteria stated below except those circled.

Note: Common contaminants such as Methylene chloride, Acetone, 2-Butanone, Carbon disulfide and TICs that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 36282C1

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were field blanks identified in this SDG?

Y N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** NA

Sampling date: 3/15/16

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: SB Associated Samples: none

Compound	Blank ID	Sample Identification								
	1									
F	4.1									

Blank units: _____ **Associated sample units:** _____

Sampling date: _____

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 12, 2016

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C129

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-032**	16C129-09**	Soil	03/15/16
KCH067-033	16C129-10	Soil	03/15/16
KCH067-041	16C129-18	Water	03/15/16
KCH067-042	16C129-19	Water	03/15/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polynuclear Aromatic Hydrocarbons (PAHs) by Environmental Protection Agency (EPA) SW 846 Method 8270C using Selected Ion Monitoring (SIM)

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

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

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

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

V. Laboratory Blanks

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

VI. Field Blanks

Sample KCH067-041 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 was identified as a source blank. No contaminants were found.

VII. Surrogates

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

VIII. Matrix Spike/Matrix Spike Duplicates

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

IX. Laboratory Control Samples

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

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

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
SVC017WL/WC (All water samples in SDG 16C129)	Acenaphthene	26 (≤20)	UJ (all non-detects)	P
	Acenaphthylene	27 (≤20)	UJ (all non-detects)	
	Naphthalene	27 (≤20)	UJ (all non-detects)	
	2-Methylnaphthalene	29 (≤20)	UJ (all non-detects)	
	1-Methylnaphthalene	28 (≤20)	UJ (all non-detects)	

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

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

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

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

XIV. System Performance

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

XV. Overall Assessment of Data

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

Due to LCS/LCSD RPD, data were qualified as estimated in two samples.

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

China Lake CTO 067
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 16C129

Sample	Compound	Flag	A or P	Reason (Code)
KCH067-041 KCH067-042	Acenaphthene Acenaphthylene Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Laboratory control samples (%R) (10)

China Lake CTO 067
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

METHOD SW3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS SIM

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/21/16 13:45
Sample ID	: KCH067-041	Date Analyzed:	03/24/16 17:44
Lab Samp ID	: C129-18	Dilution Factor:	1
Lab File ID	: RCJ395	Matrix	: WATER
Ext Btch ID	: SVC017W	% Moisture	: NA
Calib. Ref.	: RBJ007	Instrument ID	: T-OE4

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
ACENAPHTHENE	ND UJ(10)	0.50	0.050	0.10
ACENAPHTHYLENE	ND ↓	0.50	0.050	0.10
ANTHRACENE	ND	0.50	0.050	0.10
BENZO(A)ANTHRACENE	ND	0.50	0.090	0.20
BENZO(A)PYRENE	ND	0.50	0.050	0.10
BENZO(B)FLUORANTHENE	ND	0.50	0.050	0.10
BENZO(K)FLUORANTHENE	ND	0.50	0.050	0.10
BENZO(G,H,I)PERYLENE	ND	0.50	0.050	0.10
CHRYSENE	ND	0.50	0.060	0.20
DIBENZO(A,H)ANTHRACENE	ND	0.50	0.050	0.10
FLUORANTHENE	ND	0.50	0.050	0.10
FLUORENE	ND	0.50	0.050	0.10
INDENO(1,2,3-CD)PYRENE	ND	0.50	0.050	0.10
NAPHTHALENE	ND UJ(10)	0.50	0.050	0.10
PHENANTHRENE	ND	0.50	0.050	0.10
PYRENE	ND	0.50	0.050	0.10
2-METHYLNAPHTHALENE	ND UJ(10)	0.50	0.050	0.10
1-METHYLNAPHTHALENE	ND ↓	0.50	0.050	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	15.3	20.00	76.5	53-106
NITROBENZENE-D5	16.6	20.00	82.8	55-111
TERPHENYL-D14	17.9	20.00	89.6	58-132

8C 3/31/16

METHOD SW3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS SIM

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/21/16 13:45
Sample ID	: KCH067-042	Date Analyzed:	03/24/16 18:04
Lab Samp ID	: C129-19	Dilution Factor:	1.11
Lab File ID	: RCJ396	Matrix	: WATER
Ext Btch ID	: SVC017W	% Moisture	: NA
Calib. Ref.	: RBJ007	Instrument ID	: T-OE4

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
ACENAPHTHENE	ND UJ(10)	0.56	0.056	0.11
ACENAPHTHYLENE	ND	0.56	0.056	0.11
ANTHRACENE	ND	0.56	0.056	0.11
BENZO(A)ANTHRACENE	ND	0.56	0.10	0.22
BENZO(A)PYRENE	ND	0.56	0.056	0.11
BENZO(B)FLUORANTHENE	ND	0.56	0.056	0.11
BENZO(K)FLUORANTHENE	ND	0.56	0.056	0.11
BENZO(G,H,I)PERYLENE	ND	0.56	0.056	0.11
CHRYSENE	ND	0.56	0.067	0.22
DIBENZO(A,H)ANTHRACENE	ND	0.56	0.056	0.11
FLUORANTHENE	ND	0.56	0.056	0.11
FLUORENE	ND	0.56	0.056	0.11
INDENO(1,2,3-CD)PYRENE	ND	0.56	0.056	0.11
NAPHTHALENE	ND UJ(10)	0.56	0.056	0.11
PHENANTHRENE	ND	0.56	0.056	0.11
PYRENE	ND	0.56	0.056	0.11
2-METHYLNAPHTHALENE	ND UJ(10)	0.56	0.056	0.11
1-METHYLNAPHTHALENE	ND	0.56	0.056	0.11

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	18.4	22.20	82.7	53-106
NITROBENZENE-D5	19.9	22.20	89.8	55-111
TERPHENYL-D14	20.8	22.20	93.8	58-132

8-25-16

METHOD SW3550B/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS SIM

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/22/16 10:39
Sample ID:	KCH067-032	Date Analyzed:	03/23/16 18:54
Lab Samp ID:	C129-09	Dilution Factor:	1
Lab File ID:	RCJ366	Matrix	: SOIL
Ext Btch ID:	SVC018S	% Moisture	: 1.7
Calib. Ref.:	RBJ007	Instrument ID	: T-OE4

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ACENAPHTHENE	ND	10	1.3	2.5
ACENAPHTHYLENE	ND	10	1.3	2.5
ANTHRACENE	3.5J	10	1.3	2.5
BENZO(A)ANTHRACENE	69	10	2.5	5.1
BENZO(A)PYRENE	73	10	1.3	2.5
BENZO(B)FLUORANTHENE	150	10	1.3	2.5
BENZO(K)FLUORANTHENE	43	10	1.3	2.5
BENZO(G,H,I)PERYLENE	55	10	1.3	2.5
CHRYSENE	130	10	2.2	5.1
DIBENZO(A,H)ANTHRACENE	13	10	1.3	2.5
FLUORANTHENE	160	10	1.3	2.5
FLUORENE	ND	10	1.3	2.5
INDENO(1,2,3-CD)PYRENE	51	10	1.3	2.5
NAPHTHALENE	ND	10	1.3	2.5
PHENANTHRENE	41	10	1.3	2.5
PYRENE	130	10	1.3	2.5
2-METHYLNAPHTHALENE	ND	10	1.3	2.5
1-METHYLNAPHTHALENE	ND	10	1.3	2.5

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	557	678.2	82.2	46-115
NITROBENZENE-D5	585	678.2	86.2	44-125
TERPHENYL-D14	720	678.2	106	58-133

4/5/16

METHOD SW3550B/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS SIM

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/22/16 10:39
Sample ID	: KCH067-033	Date Analyzed:	03/23/16 19:14
Lab Samp ID	: C129-10	Dilution Factor:	1
Lab File ID	: RCJ367	Matrix :	SOIL
Ext Btch ID	: SVC018S	% Moisture :	1.5
Calib. Ref.	: RBJ007	Instrument ID :	T-0E4

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ACENAPHTHENE	ND	10	1.3	2.5
ACENAPHTHYLENE	ND	10	1.3	2.5
ANTHRACENE	ND	10	1.3	2.5
BENZO(A)ANTHRACENE	ND	10	2.5	5.1
BENZO(A)PYRENE	ND	10	1.3	2.5
BENZO(B)FLUORANTHENE	ND	10	1.3	2.5
BENZO(K)FLUORANTHENE	ND	10	1.3	2.5
BENZO(G,H,I)PERYLENE	ND	10	1.3	2.5
CHRYSENE	ND	10	2.2	5.1
DIBENZO(A,H)ANTHRACENE	ND	10	1.3	2.5
FLUORANTHENE	ND	10	1.3	2.5
FLUORENE	ND	10	1.3	2.5
INDENO(1,2,3-CD)PYRENE	ND	10	1.3	2.5
NAPHTHALENE	ND	10	1.3	2.5
PHENANTHRENE	ND	10	1.3	2.5
PYRENE	ND	10	1.3	2.5
2-METHYLNAPHTHALENE	ND	10	1.3	2.5
1-METHYLNAPHTHALENE	ND	10	1.3	2.5

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	554	676.9	81.9	46-115
NITROBENZENE-D5	584	676.9	86.3	44-125
TERPHENYL-D14	691	676.9	102	58-133

8/25/16

LDC #: 36282C2b **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16
SDG #: 16C129 Standard/Full Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%D RSD ≤ 15, r² ICV ≤ 20
IV.	Continuing calibration / ending CCV	A	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = 3 SB = 4
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	SW	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Standard validation.
XIII.	Target compound identification	A	Not reviewed for Standard validation.
XIV.	System performance	A	Not reviewed for Standard validation.
XV.	Overall assessment of data	A	

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

** Indicates sample underwent Full validation

	Client ID		Lab ID	Matrix	Date
1	KCH067-032**		16C129-09**	Soil	03/15/16
2	KCH067-033		16C129-10	Soil	03/15/16
3	KCH067-041	EB	16C129-18	Water	03/15/16
4	KCH067-042	SB	16C129-19	Water	03/15/16
5					
6					
7					
8					
9					

Notes:

	MBLK1W						
	MBLK1S						

LDC #: 36282C2b

VALIDATION FINDINGS CHECKLIST

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

Method: Semivolatiles (EPA SW 846 Method 8270C-SIM)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check (Not required)				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 15% and relative response factors (RRF) ≥ 0.05?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤20% or percent recoveries (%R) 80-120%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent differences (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	

LDC #: 36282C2b

VALIDATION FINDINGS CHECKLIST

Reviewer: FP
2nd Reviewer: C

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

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

LDC #: 36282c2b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

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

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

(Y) N N/A Was a LCS required?

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

code = 10

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	SVC017WL/WC	GG	( )	( )	26 (20)	all water	J/UJ/P (ND)
		DD	( )	( )	27 (↓)		
		S	( )	( )	27 (↓)	↓	↓
		W	( )	( )	29 (↓)	↓	↓
		TTT	( )	( )	28 (↓)	↓	↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 36282C2b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)
The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Internal Standard)	Reported RRF (10 std)	Recalculated RRF (10 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	2/2/16	S (1st IS)	3.981	3.981	4.006	4.006	3.76	3.76
			YY (2nd IS)	1.437	1.437	1.451	1.451	9.00	9.00
			III (3rd IS)	1.165	1.165	1.083	1.083	11.33	11.33
			(4th IS)						
			(5th IS)						
			(6th IS)						
2			(1st IS)						
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						
3			(1st IS)						
			(2nd IS)						
			(3rd IS)						
			(4th IS)						
			(5th IS)						
			(6th IS)						

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

LDC #: 36282c2b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)
The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

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

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

#	Standard ID	Calibration Date	Compound (Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV	3/23/16	S (1st IS)	4.006	3.851	3.851	3.9	3.9
			YY (2nd IS)	1.451	1.395	1.395	3.9	3.9
			III (3rd IS)	1.083	1.158	1.158	6.9	6.9
			(4th IS)					
			(5th IS)					
			(6th IS)					
2			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
3			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					

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

LDC #: 36282 cab

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer: M

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

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	10.0	8.62	86.2	86.2	0
2-Fluorobiphenyl	↓	8.22	82.2	82.2	↓
Terphenyl-d14	↓	10.61	106	106	↓
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 36282C2b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

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

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

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

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

LCS/LCSD samples: SV0018SL/SC

Compound	Spike Added (ug/kg)		Spike Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol										
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol										
Acenaphthene	1330	1330	1010	943	76	76	71	71	7	7
Pentachlorophenol										
Pyrene	↓	↓	1320	1270	99	99	95	95	4	4

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

LDC #: 36282c2b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer:

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

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

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

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

2/30

Example:

Sample I.D. #1, 44:

Conc. = $\frac{(37891)(40)(2)(1000)}{(1902181)(1.330)(30)(0.983)}$

=

41 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 12, 2016

Parameters: Chlorinated Pesticides

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C129

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-022	16C129-01	Soil	03/15/16
KCH067-022DL	16C129-01DL	Soil	03/15/16
KCH067-023	16C129-02	Soil	03/15/16
KCH067-023DL	16C129-02DL	Soil	03/15/16
KCH067-024	16C129-03	Soil	03/15/16
KCH067-024DL	16C129-03DL	Soil	03/15/16
KCH067-025	16C129-04	Soil	03/15/16
KCH067-025DL	16C129-04DL	Soil	03/15/16
KCH067-026**	16C129-05**	Soil	03/15/16
KCH067-026DL**	16C129-05DL**	Soil	03/15/16
KCH067-027	16C129-06	Soil	03/15/16
KCH067-027DL	16C129-06DL	Soil	03/15/16
KCH067-028	16C129-07	Soil	03/15/16
KCH067-028DL	16C129-07DL	Soil	03/15/16
KCH067-029	16C129-08	Soil	03/15/16
KCH067-029DL	16C129-08DL	Soil	03/15/16
KCH067-041	16C129-18	Water	03/15/16
KCH067-042	16C129-19	Water	03/15/16
KCH067-022MS	16C129-01MS	Soil	03/15/16
KCH067-022MSD	16C129-01MSD	Soil	03/15/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chlorinated Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8081A

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. GC Instrument Performance Check

Instrument performance 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 and Initial Calibration Verification

An 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.

Retention time windows were established as required by the method for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

The percent differences (%D) of the initial calibration verification (ICV) standard 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 with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
03/22/16 (16:15)	CCV	RTX CLP2	alpha-BHC	22	All water samples in SDG 16C129	UJ (all non-detects)	A
03/22/16 (20:18)	CCV	RTX CLP2	alpha-BHC	23	KCH067-022 KCH067-023 KCH067-024 KCH067-025 KCH067-027 KCH067-029	UJ (all non-detects)	A

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
03/23/16 (20:25)	CCV	RTX CLP2	alpha-BHC gamma-BHC	31 25	KCH067-022DL KCH067-023DL KCH067-024DL KCH067-025DL KCH067-027DL KCH067-028 KCH067-029DL	UJ (all non-detects) UJ (all non-detects)	A
03/24/16 (20:03)	CCV	RTX CLP1	gamma-Chlordane alpha-Chlordane Endosulfan I	34 24 21	KCH067-026** KCH067-026DL** KCH067-028DL	J (all detects) UJ (all non-detects)	A
03/24/16 (20:03)	CCV	RTX CLP2	Aldrin	22	KCH067-026** KCH067-026DL** KCH067-028DL	J (all detects) UJ (all non-detects)	A

Retention times of all compounds in the calibration standards were within the established retention time windows for samples which underwent Level IV validation.

V. Laboratory Blanks

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

VI. Field Blanks

Sample KCH067-041 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 was identified as a source blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for several samples. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were not within the QC limits for KCH067-022MS/MSD. No data were qualified for Dieldrin since the parent sample results were greater than 4X the spiked concentration. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

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

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
KCH067-022	Dieldrin Chlordane (Technical)	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A
KCH067-023 KCH067-026** KCH067-028	alpha-Chlordane gamma-Chlordane Chlordane (Technical)	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	A
KCH067-024	alpha-Chlordane gamma-Chlordane	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A
KCH067-025	alpha-Chlordane gamma-Chlordane 4,4'-DDE 4,4'-DDT Chlordane (Technical)	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
KCH067-027 KCH067-029	alpha-Chlordane gamma-Chlordane Dieldrin Chlordane (Technical)	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects)	A

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
KCH067-022	gamma-Chlordane Dieldrin 4,4'-DDT Chlordane (Technical)	52 78 45 45	J (all detects) J (all detects) J (all detects) J (all detects)	A
KCH067-022DL	gamma-Chlordane alpha-Chlordane	75 67	J (all detects) J (all detects)	A

Sample	Compound	RPD	Flag	A or P
KCH067-023	gamma-Chlordane Dieldrin 4,4'-DDT Chlordane (Technical)	84 50 89 63	J (all detects) J (all detects) J (all detects) J (all detects)	A
KCH067-023DL	alpha-Chlordane 4,4'-DDT	52 49	J (all detects) J (all detects)	A
KCH067-024	gamma-Chlordane alpha-Chlordane 4,4'-DDT	42 50 79	J (all detects) J (all detects) J (all detects)	A
KCH067-024DL	alpha-Chlordane	73	J (all detects)	A
KCH067-025	gamma-Chlordane 4,4'-DDE 4,4'-DDT Chlordane (Technical)	90 85 83 69	J (all detects) J (all detects) J (all detects) J (all detects)	A
KCH067-025DL	alpha-Chlordane Dieldrin	78 151	J (all detects) J (all detects)	A
KCH067-026**	gamma-Chlordane alpha-Chlordane Dieldrin Endrin Chlordane (Technical)	144 147 95 102 52	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
KCH067-026DL**	alpha-Chlordane	51	J (all detects)	A
KCH067-027	gamma-Chlordane alpha-Chlordane 4,4'-DDT Chlordane (Technical)	82 81 81 56	J (all detects) J (all detects) J (all detects) J (all detects)	A
KCH067-027DL	alpha-Chlordane	70	J (all detects)	A
KCH067-028DL	alpha-Chlordane 4,4'-DDE	74 48	J (all detects) J (all detects)	A
KCH067-029	Aldrin gamma-Chlordane 4,4'-DDE Dieldrin	57 65 57 42	J (all detects) J (all detects) J (all detects) J (all detects)	A
KCH067-029DL	alpha-Chlordane 4,4'-DDE 4,4'-DDT	76 63 56	J (all detects) J (all detects) J (all detects)	A

Raw data were not reviewed for Level III validation.

XII. Target Compound Identification

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

XIII. System Performance

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

XIII. Overall Assessment of Data

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

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Flag	A or P
KCH067-022	Dieldrin Chlordane (Technical)	R R	A
KCH067-022DL	All compounds except Dieldrin Chlordane (Technical)	R	A
KCH067-023 KCH067-026** KCH067-028	alpha-Chlordane gamma-Chlordane Chlordane (Technical)	R R R	A
KCH067-023DL KCH067-026DL** KCH067-028DL	All compounds except alpha-Chlordane gamma-Chlordane Chlordane (Technical)	R	A
KCH067-024	alpha-Chlordane gamma-Chlordane	R R	A
KCH067-024DL	All compounds except alpha-Chlordane gamma-Chlordane	R	A
KCH067-025	alpha-Chlordane gamma-Chlordane 4,4'-DDE 4,4'-DDT Chlordane (Technical)	R R R R R	A

Sample	Compound	Flag	A or P
KCH067-025DL	All compounds except alpha-Chlordane gamma-Chlordane 4,4'-DDE 4,4'-DDT Chlordane (Technical)	R	A
KCH067-027 KCH067-029	alpha-Chlordane gamma-Chlordane Dieldrin Chlordane (Technical)	R R R R	A
KCH067-027DL KCH067-029DL	All compounds except alpha-Chlordane gamma-Chlordane Dieldrin Chlordane (Technical)	R	A

Due to continuing calibration %D and RPD between two columns, data were qualified as estimated in ten samples.

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

China Lake CTO 067
Chlorinated Pesticides - Data Qualification Summary - SDG 16C129

Sample	Compound	Flag	A or P	Reason (Code)
KCH067-041 KCH067-042 KCH067-022 KCH067-023 KCH067-024 KCH067-025 KCH067-027 KCH067-029	alpha-BHC	UJ (all non-detects)	A	Continuing calibration (%D) (5)
KCH067-028	alpha-BHC gamma-BHC	UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D) (5)
KCH067-026** KCH067-026DL** KCH067-028DL	gamma-Chlordane alpha-Chlordane Endosulfan I Aldrin	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D) (5)
KCH067-022	gamma-Chlordane 4,4'-DDT	J (all detects) J (all detects)	A	Compound quantitation (RPD between two columns) (12)
KCH067-023	Dieldrin 4,4'-DDT	J (all detects) J (all detects)	A	Compound quantitation (RPD between two columns) (12)
KCH067-024 KCH067-027	4,4'-DDT	J (all detects)	A	Compound quantitation (RPD between two columns) (12)
KCH067-023DL KCH067-024DL KCH067-025DL KCH067-026DL** KCH067-027DL KCH067-028DL KCH067-029DL	alpha-Chlordane	J (all detects)	A	Compound quantitation (RPD between two columns) (12)
KCH067-026**	Dieldrin Endrin	J (all detects) J (all detects)	A	Compound quantitation (RPD between two columns) (12)
KCH067-029	Aldrin 4,4'-DDE	J (all detects) J (all detects)	A	Compound quantitation (RPD between two columns) (12)
KCH067-022	Dieldrin Chlordane (Technical)	R R	A	Overall assessment of data (22)
KCH067-022DL	All compounds except Dieldrin Chlordane (Technical)	R	A	Overall assessment of data (22)
KCH067-023 KCH067-026** KCH067-028	alpha-Chlordane gamma-Chlordane Chlordane (Technical)	R R R	A	Overall assessment of data (22)

Sample	Compound	Flag	A or P	Reason (Code)
KCH067-023DL KCH067-026DL** KCH067-028DL	All compounds except alpha-Chlordane gamma-Chlordane Chlordane (Technical)	R	A	Overall assessment of data (22)
KCH067-024	alpha-Chlordane gamma-Chlordane	R R	A	Overall assessment of data (22)
KCH067-024DL	All compounds except alpha-Chlordane gamma-Chlordane	R	A	Overall assessment of data (22)
KCH067-025	alpha-Chlordane gamma-Chlordane 4,4'-DDE 4,4'-DDT Chlordane (Technical)	R R R R R	A	Overall assessment of data (22)
KCH067-025DL	All compounds except alpha-Chlordane gamma-Chlordane 4,4'-DDE 4,4'-DDT Chlordane (Technical)	R	A	Overall assessment of data (22)
KCH067-027 KCH067-029	alpha-Chlordane gamma-Chlordane Dieldrin Chlordane (Technical)	R R R R	A	Overall assessment of data (22)
KCH067-027DL KCH067-029DL	All compounds except alpha-Chlordane gamma-Chlordane Dieldrin Chlordane (Technical)	R	A	Overall assessment of data (22)

China Lake CTO 067
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-022	Date Analyzed: 03/22/16 20:59
Lab Samp ID: C129-01	Dilution Factor: 1
Lab File ID: RC22025A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 1.5
Calib. Ref.: RC22023A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND UJ(5)	2.0	0.20	0.41
GAMMA-BHC (LINDANE)	(ND)	ND	2.0	0.20	0.41
BETA-BHC	(ND)	ND	2.0	0.20	0.41
HEPTACHLOR	(ND)	ND	2.0	0.20	0.41
DELTA-BHC	(ND)	ND	2.0	0.27	0.41
ALDRIN	(ND)	ND	2.0	0.20	0.41
HEPTACHLOR EPOXIDE	(ND)	ND	2.0	0.20	0.41
GAMMA-CHLORDANE	9.4	(16) J(12)	2.0	0.20	0.41
ALPHA-CHLORDANE	(17)	13	2.0	0.20	0.41
ENDOSULFAN I	(ND)	ND	2.0	0.20	0.41
4,4'-DDE	7.9	(11)	2.0	0.20	0.41
DIELDRIN	140E	(320E) R(22)	2.0	0.20	0.41
ENDRIN	(ND)	0.56J	2.0	0.20	0.41
4,4'-DDD	(ND)	0.71J	2.0	0.20	0.41
ENDOSULFAN II	0.26J	(ND)	2.0	0.20	0.41
4,4'-DDT	6.1	(9.6) J(12)	2.0	0.20	0.41
ENDRIN ALDEHYDE	(ND)	ND	2.0	0.36	0.41
ENDOSULFAN SULFATE	(ND)	0.35J	2.0	0.20	0.41
ENDRIN KETONE	(ND)	ND	2.0	0.20	0.41
METHOXYCHLOR	(ND)	ND	10	2.0	4.1
TOXAPHENE	(ND)	ND	51	5.1	10
TECHNICAL CHLORDANE	380	(600E) R(22)	51	10	20

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	13.12 (14.04)	13.53	96.9 (104)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

SG 5/17/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-022DL	Date Analyzed: 03/23/16 20:45
Lab Samp ID: C129-011	Dilution Factor: 10
Lab File ID: RC22058A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 1.5
Calib. Ref.: RC22057A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND	20	2.0	4.1
GAMMA-BHC (LINDANE)	(ND)	ND	20	2.0	4.1
BETA-BHC	(ND)	ND	20	2.0	4.1
HEPTACHLOR	(ND)	ND	20	2.0	4.1
DELTA-BHC	(ND)	ND	20	2.7	4.1
ALDRIN	(ND)	ND	20	2.0	4.1
HEPTACHLOR EPOXIDE	(ND)	ND	20	2.0	4.1
GAMMA-CHLORDANE	9.6J	(21)	20	2.0	4.1
ALPHA-CHLORDANE	32	(16J)	20	2.0	4.1
ENDOSULFAN I	(ND)	ND	20	2.0	4.1
4,4'-DDE	(14J)	13J	20	2.0	4.1
DIELDRIN	340	(440)	20	2.0	4.1
ENDRIN	(ND)	ND	20	2.0	4.1
4,4'-DDD	(ND)	3.1J	20	2.0	4.1
ENDOSULFAN II	(ND)	ND	20	2.0	4.1
4,4'-DDT	(13J)	12J	20	2.0	4.1
ENDRIN ALDEHYDE	(ND)	ND	20	3.6	4.1
ENDOSULFAN SULFATE	(ND)	ND	20	2.0	4.1
ENDRIN KETONE	(ND)	ND	20	2.0	4.1
METHOXYCHLOR	(ND)	ND	100	20	41
TOXAPHENE	(ND)	ND	510	51	100
TECHNICAL CHLORDANE	(930)	930	510	100	200

R(22)

R(22)

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	14.05 (15.43)	13.53	104 (114)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

4/25/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-023	Date Analyzed: 03/22/16 22:01
Lab Samp ID: C129-02	Dilution Factor: 1
Lab File ID: RC22028A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 4.3
Calib. Ref.: RC22023A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND UJ(5)	2.1	0.21	0.42
GAMMA-BHC (LINDANE)	(ND)	14	2.1	0.21	0.42
BETA-BHC	(ND)	ND	2.1	0.21	0.42
HEPTACHLOR	(ND)	ND	2.1	0.21	0.42
DELTA-BHC	(ND)	3.8	2.1	0.28	0.42
ALDRIN	2.0J	(2.2)	2.1	0.21	0.42
HEPTACHLOR EPOXIDE	(ND)	ND	2.1	0.21	0.42
GAMMA-CHLORDANE	130E	(320E) R(22)	2.1	0.21	0.42
ALPHA-CHLORDANE	190E	(270E) ↓	2.1	0.21	0.42
ENDOSULFAN I	3.2	(ND)	2.1	0.21	0.42
4,4'-DDE	(19)	18	2.1	0.21	0.42
DIELDRIN	(52)	87E J(12)	2.1	0.21	0.42
ENDRIN	(ND)	12	2.1	0.21	0.42
4,4'-DDD	(ND)	ND	2.1	0.21	0.42
ENDOSULFAN II	(ND)	ND	2.1	0.21	0.42
4,4'-DDT	8.5	(22) J(12)	2.1	0.21	0.42
ENDRIN ALDEHYDE	(ND)	ND	2.1	0.37	0.42
ENDOSULFAN SULFATE	(ND)	1.9J	2.1	0.21	0.42
ENDRIN KETONE	(ND)	ND	2.1	0.21	0.42
METHOXYCHLOR	(ND)	ND	10	2.1	4.2
TOXAPHENE	(ND)	ND	52	5.2	10
TECHNICAL CHLORDANE	1400E	(2700E) R(22)	52	10	21

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	12.11 (13.33)	13.93	87.0 (95.7)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

SC 5/17/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-023DL	Date Analyzed: 03/23/16 21:46
Lab Samp ID: C129-02I	Dilution Factor: 20
Lab File ID: RC22061A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 4.3
Calib. Ref.: RC22057A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND R(22)	42	4.2	8.4
GAMMA-BHC (LINDANE)	(ND)	ND	42	4.2	8.4
BETA-BHC	(ND)	ND	42	4.2	8.4
HEPTACHLOR	(ND)	ND	42	4.2	8.4
DELTA-BHC	(ND)	5.9J	42	5.6	8.4
ALDRIN	(ND)	ND	42	4.2	8.4
HEPTACHLOR EPOXIDE	(ND)	ND	42	4.2	8.4
GAMMA-CHLORDANE	330	(460)	42	4.2	8.4
ALPHA-CHLORDANE	680E	(400) J(12)	42	4.2	8.4
ENDOSULFAN I	(ND)	ND R(22)	42	4.2	8.4
4,4'-DDE	(31J)	25J	42	4.2	8.4
DIELDRIN	100	(130)	42	4.2	8.4
ENDRIN	(ND)	ND	42	4.2	8.4
4,4'-DDD	(ND)	ND	42	4.2	8.4
ENDOSULFAN II	(ND)	ND	42	4.2	8.4
4,4'-DDT	20J	(33J)	42	4.2	8.4
ENDRIN ALDEHYDE	(ND)	ND	42	7.3	8.4
ENDOSULFAN SULFATE	(ND)	ND	42	4.2	8.4
ENDRIN KETONE	(ND)	ND	42	4.2	8.4
METHOXYCHLOR	(ND)	ND	210	42	84
TOXAPHENE	(ND)	ND	1000	100	210
TECHNICAL CHLORDANE	3400	(4100)	1000	210	420

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	16.35 (17.23)	13.93	117 (124)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

8605171L

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-024	Date Analyzed: 03/22/16 22:21
Lab Samp ID: C129-03	Dilution Factor: 1
Lab File ID: RC22029A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 2.1
Calib. Ref.: RC22023A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND	2.0	0.20	0.41
GAMMA-BHC (LINDANE)	(ND)	ND	2.0	0.20	0.41
BETA-BHC	(ND)	ND	2.0	0.20	0.41
HEPTACHLOR	(ND)	ND	2.0	0.20	0.41
DELTA-BHC	(ND)	ND	2.0	0.28	0.41
ALDRIN	(0.26J)	0.24J	2.0	0.20	0.41
HEPTACHLOR EPOXIDE	(ND)	ND	2.0	0.20	0.41
GAMMA-CHLORDANE	27E	(45E)	2.0	0.20	0.41
ALPHA-CHLORDANE	(55E)	36E	2.0	0.20	0.41
ENDOSULFAN I	0.49J	(ND)	2.0	0.20	0.41
4,4'-DDE	9.0	(10)	2.0	0.20	0.41
DIELDRIN	1.4J	(ND)	2.0	0.20	0.41
ENDRIN	(ND)	0.84J	2.0	0.20	0.41
4,4'-DDD	(ND)	ND	2.0	0.20	0.41
ENDOSULFAN II	(ND)	ND	2.0	0.20	0.41
4,4'-DDT	1.0J	(2.3)	2.0	0.20	0.41
ENDRIN ALDEHYDE	(ND)	ND	2.0	0.36	0.41
ENDOSULFAN SULFATE	(ND)	ND	2.0	0.20	0.41
ENDRIN KETONE	(ND)	ND	2.0	0.20	0.41
METHOXYCHLOR	(ND)	ND	10	2.0	4.1
TOXAPHENE	(ND)	ND	51	5.1	10
TECHNICAL CHLORDANE	470	(500)	51	10	20

SURROGATE PARAMETERS	RESULTS		SPK_AMT	% RECOVERY		QC LIMIT
TETRACHLORO-M-XYLENE	12.70	(15.28)	13.62	93.2	(112)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

4/25/16

METHOD SW3550B/8081A
PESTICIDES

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/21/16 13:45
Sample ID	: KCH067-024DL	Date Analyzed:	03/23/16 22:06
Lab Samp ID	: C129-03I	Dilution Factor:	5
Lab File ID	: RC22062A	Matrix	: SOIL
Ext Btch ID	: CPC019S	% Moisture	: 2.1
Calib. Ref.	: RC22057A	Instrument ID	: F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND R(22)	10	1.0	2.0
GAMMA-BHC (LINDANE)	(ND)	ND	10	1.0	2.0
BETA-BHC	(ND)	ND	10	1.0	2.0
HEPTACHLOR	(ND)	ND	10	1.0	2.0
DELTA-BHC	(ND)	ND	10	1.4	2.0
ALDRIN	(ND)	ND	10	1.0	2.0
HEPTACHLOR EPOXIDE	(ND)	ND	10	1.0	2.0
GAMMA-CHLORDANE	39	(53)	10	1.0	2.0
ALPHA-CHLORDANE	(86)	40 J R(32) (13)	10	1.0	2.0
ENDOSULFAN I	(ND)	ND	10	1.0	2.0
4,4'-DDE	(15)	12	10	1.0	2.0
DIELDRIN	(ND)	ND	10	1.0	2.0
ENDRIN	(ND)	ND	10	1.0	2.0
4,4'-DDD	(ND)	ND	10	1.0	2.0
ENDOSULFAN II	(ND)	ND	10	1.0	2.0
4,4'-DDT	(ND)	2.8J	10	1.0	2.0
ENDRIN ALDEHYDE	(ND)	ND	10	1.8	2.0
ENDOSULFAN SULFATE	(ND)	ND	10	1.0	2.0
ENDRIN KETONE	(ND)	ND	10	1.0	2.0
METHOXYCHLOR	(ND)	ND	51	10	20
TOXAPHENE	(ND)	ND	260	26	51
TECHNICAL CHLORDANE	550	(580)	260	51	100

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	16.11 | (16.26)	13.62	118 | (119)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

8/25/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-025	Date Analyzed: 03/22/16 22:42
Lab Samp ID: C129-04	Dilution Factor: 1
Lab File ID: RC22030A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 4.3
Calib. Ref.: RC22023A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND UJ(S)	2.1	0.21	0.42
GAMMA-BHC (LINDANE)	(ND)	32E	2.1	0.21	0.42
BETA-BHC	24	(ND)	2.1	0.21	0.42
HEPTACHLOR	(ND)	1.6J	2.1	0.21	0.42
DELTA-BHC	(ND)	1.1J	2.1	0.28	0.42
ALDRIN	1.2J	(ND)	2.1	0.21	0.42
HEPTACHLOR EPOXIDE	17	(ND)	2.1	0.21	0.42
GAMMA-CHLORDANE	140E	(370E) R(22)	2.1	0.21	0.42
ALPHA-CHLORDANE	210E	(300E) ↓	2.1	0.21	0.42
ENDOSULFAN I	5.0	(ND)	2.1	0.21	0.42
4,4'-DDE	170E	(420E) R(22)	2.1	0.21	0.42
DIELDRIN	42	(46)	2.1	0.21	0.42
ENDRIN	(ND)	10	2.1	0.21	0.42
4,4'-DDD	(ND)	ND	2.1	0.21	0.42
ENDOSULFAN II	(ND)	ND	2.1	0.21	0.42
4,4'-DDT	220E	(530E) R(22)	2.1	0.21	0.42
ENDRIN ALDEHYDE	(ND)	ND	2.1	0.37	0.42
ENDOSULFAN SULFATE	(ND)	2.2	2.1	0.21	0.42
ENDRIN KETONE	(ND)	ND	2.1	0.21	0.42
METHOXYCHLOR	(ND)	ND	10	2.1	4.2
TOXAPHENE	(ND)	ND	52	5.2	10
TECHNICAL CHLORDANE	2100E	(4300E) R(22)	52	10	21

SURROGATE PARAMETERS	RESULTS		SPK_AMT	% RECOVERY		QC LIMIT
TETRACHLORO-M-XYLENE	(13.73)	13.19	13.93	(98.5)	94.7	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

SG 05/17/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-025DL	Date Analyzed: 03/23/16 22:26
Lab Samp ID: C129-04I	Dilution Factor: 40
Lab File ID: RC22063A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 4.3
Calib. Ref.: RC22057A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND) | ND	R(22)	84	8.4	17
GAMMA-BHC (LINDANE)	(ND) | ND		84	8.4	17
BETA-BHC	(ND) | ND		84	8.4	17
HEPTACHLOR	(ND) | ND		84	8.4	17
DELTA-BHC	(ND) | ND		84	11	17
ALDRIN	(ND) | ND		84	8.4	17
HEPTACHLOR EPOXIDE	(ND) | ND		84	8.4	17
GAMMA-CHLORDANE	360 | (460)		84	8.4	17
ALPHA-CHLORDANE	(840) | 370	J(12)	84	8.4	17
ENDOSULFAN I	(ND) | ND	R(22)	84	8.4	17
4,4'-DDE	520 | (540)		84	8.4	17
DIELDRIN	(11J) | 79J	R(22)	84	8.4	17
ENDRIN	(ND) | ND		84	8.4	17
4,4'-DDD	(ND) | ND		84	8.4	17
ENDOSULFAN II	(ND) | ND		84	8.4	17
4,4'-DDT	540 | (570)		84	8.4	17
ENDRIN ALDEHYDE	(ND) | ND	R(22)	84	15	17
ENDOSULFAN SULFATE	(ND) | ND		84	8.4	17
ENDRIN KETONE	(ND) | ND		84	8.4	17
METHOXYCHLOR	(ND) | ND		420	84	170
TOXAPHENE	(ND) | ND		2100	210	420
TECHNICAL CHLORDANE	(6000) | 5800		2100	420	840

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	14.47 | (17.42)	13.93	104 | (125)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

8/25/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-026	Date Analyzed: 03/24/16 20:44
Lab Samp ID: C129-05K	Dilution Factor: 20
Lab File ID: RC22087A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 3.9
Calib. Ref.: RC22085A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND	42	4.2	8.3
GAMMA-BHC (LINDANE)	(ND)	ND	42	4.2	8.3
BETA-BHC	(ND)	ND	42	4.2	8.3
HEPTACHLOR	(ND)	270	42	4.2	8.3
DELTA-BHC	22J	(ND)	42	5.6	8.3
ALDRIN	270	(ND) UJ(5)	42	4.2	8.3
HEPTACHLOR EPOXIDE	2600E	(ND)	42	4.2	8.3
GAMMA-CHLORDANE	2300E	(14000E) R(22)	42	4.2	8.3
ALPHA-CHLORDANE	2000E	(13000E) ↓	42	4.2	8.3
ENDOSULFAN I	540	(ND) UJ(5)	42	4.2	8.3
4,4'-DDE	2400E	(ND)	42	4.2	8.3
DIELDRIN	1100	(390) J(12)	42	4.2	8.3
ENDRIN	(150)	460 ↓	42	4.2	8.3
4,4'-DDD	(ND)	ND	42	4.2	8.3
ENDOSULFAN II	390	(ND)	42	4.2	8.3
4,4'-DDT	(270)	240	42	4.2	8.3
ENDRIN ALDEHYDE	(ND)	ND	42	7.3	8.3
ENDOSULFAN SULFATE	(ND)	ND	42	4.2	8.3
ENDRIN KETONE	(ND)	ND	42	4.2	8.3
METHOXYCHLOR	(ND)	ND	210	42	83
TOXAPHENE	(ND)	ND	1000	100	210
TECHNICAL CHLORDANE	76000E	(130000E) R(22)	1000	210	420

SURROGATE PARAMETERS	RESULTS		SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	12.30	(13.52)	13.87	88.7 (97.5)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

4/25/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-026DL	Date Analyzed: 03/24/16 20:23
Lab Samp ID: C129-05J	Dilution Factor: 2000
Lab File ID: RC22086A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 3.9
Calib. Ref.: RC22085A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND	4200	420	830
GAMMA-BHC (LINDANE)	(ND)	ND	4200	420	830
BETA-BHC	(ND)	ND	4200	420	830
HEPTACHLOR	(ND)	ND	4200	420	830
DELTA-BHC	(ND)	ND	4200	560	830
ALDRIN	(ND)	ND	4200	420	830
HEPTACHLOR EPOXIDE	(ND)	ND	4200	420	830
GAMMA-CHLORDANE	20000	(24000)	4200	420	830
ALPHA-CHLORDANE	(37000)	22000	4200	420	830
ENDOSULFAN I	(ND)	ND	4200	420	830
4,4'-DDE	960J	(ND)	4200	420	830
DIELDRIN	1000J	(ND)	4200	420	830
ENDRIN	(ND)	600J	4200	420	830
4,4'-DDD	(ND)	ND	4200	420	830
ENDOSULFAN II	(ND)	ND	4200	420	830
4,4'-DDT	(ND)	ND	4200	420	830
ENDRIN ALDEHYDE	(ND)	ND	4200	730	830
ENDOSULFAN SULFATE	(ND)	ND	4200	420	830
ENDRIN KETONE	(ND)	ND	4200	420	830
METHOXYCHLOR	(ND)	ND	21000	4200	8300
TOXAPHENE	(ND)	ND	100000	10000	21000
TECHNICAL CHLORDANE	(200000)	200000	100000	21000	42000

R(22)
J(5)
(12)
R(22)

SURROGATE PARAMETERS	RESULTS		SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	(ND)	ND	13.87 (0.000000*)	0.000000*	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

5/5/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-027	Date Analyzed: 03/22/16 23:23
Lab Samp ID: C129-06	Dilution Factor: 1
Lab File ID: RC22032A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 5.6
Calib. Ref.: RC22023A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND	2.1	0.21	0.42
GAMMA-BHC (LINDANE)	(ND)	ND	2.1	0.21	0.42
BETA-BHC	(ND)	ND	2.1	0.21	0.42
HEPTACHLOR	(ND)	ND	2.1	0.21	0.42
DELTA-BHC	(ND)	9.8	2.1	0.29	0.42
ALDRIN	(ND)	1.6J	2.1	0.21	0.42
HEPTACHLOR EPOXIDE	34E	(ND)	2.1	0.21	0.42
GAMMA-CHLORDANE	180E	(430E)	2.1	0.21	0.42
ALPHA-CHLORDANE	170E	(400E)	2.1	0.21	0.42
ENDOSULFAN I	(ND)	10	2.1	0.21	0.42
4,4'-DDE	(ND)	ND	2.1	0.21	0.42
DIELDRIN	110E	(160E)	2.1	0.21	0.42
ENDRIN	(ND)	ND	2.1	0.21	0.42
4,4'-DDD	(ND)	ND	2.1	0.21	0.42
ENDOSULFAN II	(ND)	ND	2.1	0.21	0.42
4,4'-DDT	5.1	(12)	2.1	0.21	0.42
ENDRIN ALDEHYDE	(ND)	3.1	2.1	0.37	0.42
ENDOSULFAN SULFATE	(ND)	1.8J	2.1	0.21	0.42
ENDRIN KETONE	1.2J	(ND)	2.1	0.21	0.42
METHOXYCHLOR	(ND)	ND	11	2.1	4.2
TOXAPHENE	(ND)	ND	53	5.3	11
TECHNICAL CHLORDANE	2300E	(4100E)	53	11	21

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	15.83 | (16.48)	14.12	112 | (117)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-027DL	Date Analyzed: 03/23/16 23:07
Lab Samp ID: C129-06I	Dilution Factor: 40
Lab File ID: RC22065A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 5.6
Calib. Ref.: RC22057A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND	85	8.5	17
GAMMA-BHC (LINDANE)	(ND)	ND	85	8.5	17
BETA-BHC	(ND)	ND	85	8.5	17
HEPTACHLOR	(ND)	ND	85	8.5	17
DELTA-BHC	(ND)	14J	85	11	17
ALDRIN	(ND)	ND	85	8.5	17
HEPTACHLOR EPOXIDE	50J	(ND)	85	8.5	17
GAMMA-CHLORDANE	550	(680)	85	8.5	17
ALPHA-CHLORDANE	1200E	(580)	85	8.5	17
ENDOSULFAN I	(ND)	17J	85	8.5	17
4,4'-DDE	15J	(ND)	85	8.5	17
DIELDRIN	(200)	190	85	8.5	17
ENDRIN	(ND)	ND	85	8.5	17
4,4'-DDD	(ND)	ND	85	8.5	17
ENDOSULFAN II	(ND)	ND	85	8.5	17
4,4'-DDT	(ND)	13J	85	8.5	17
ENDRIN ALDEHYDE	(ND)	ND	85	15	17
ENDOSULFAN SULFATE	(ND)	ND	85	8.5	17
ENDRIN KETONE	(ND)	ND	85	8.5	17
METHOXYCHLOR	(ND)	ND	420	85	170
TOXAPHENE	(ND)	ND	2100	210	420
TECHNICAL CHLORDANE	6000	(6000)	2100	420	850

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	14.83 (16.04)	14.12	105 (114)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-028	Date Analyzed: 03/23/16 23:28
Lab Samp ID: C129-07I	Dilution Factor: 20
Lab File ID: RC22066A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 2.3
Calib. Ref.: RC22057A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND UJ(S)	41	4.1	8.2
GAMMA-BHC (LINDANE)	(ND)	ND	41	4.1	8.2
BETA-BHC	(ND)	ND	41	4.1	8.2
HEPTACHLOR	(ND)	ND	41	4.1	8.2
DELTA-BHC	(ND)	ND	41	5.5	8.2
ALDRIN	(ND)	ND	41	4.1	8.2
HEPTACHLOR EPOXIDE	(ND)	ND	41	4.1	8.2
GAMMA-CHLORDANE	1700E	(2300E) R(>>)	41	4.1	8.2
ALPHA-CHLORDANE	(3000E)	2000E	41	4.1	8.2
ENDOSULFAN I	(ND)	70	41	4.1	8.2
4,4'-DDE	(300)	210	41	4.1	8.2
DIELDRIN	(290)	290	41	4.1	8.2
ENDRIN	(ND)	ND	41	4.1	8.2
4,4'-DDD	(ND)	ND	41	4.1	8.2
ENDOSULFAN II	(ND)	ND	41	4.1	8.2
4,4'-DDT	84	(120)	41	4.1	8.2
ENDRIN ALDEHYDE	(ND)	ND	41	7.2	8.2
ENDOSULFAN SULFATE	(ND)	ND	41	4.1	8.2
ENDRIN KETONE	(ND)	ND	41	4.1	8.2
METHOXYCHLOR	(ND)	ND	200	41	82
TOXAPHENE	(ND)	ND	1000	100	200
TECHNICAL CHLORDANE	19000E	(22000E) R(>>)	1000	200	410

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	14.75 | (15.21)	13.64	108 | (111)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

Scott 7/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-028DL	Date Analyzed: 03/24/16 21:24
Lab Samp ID: C129-07J	Dilution Factor: 200
Lab File ID: RC22089A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 2.3
Calib. Ref.: RC22085A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND	410	41	82
GAMMA-BHC (LINDANE)	(ND)	ND	410	41	82
BETA-BHC	(ND)	ND	410	41	82
HEPTACHLOR	45J	(ND)	410	41	82
DELTA-BHC	(ND)	ND	410	55	82
ALDRIN	(ND)	ND	410	41	82
HEPTACHLOR EPOXIDE	(ND)	ND	410	41	82
GAMMA-CHLORDANE	1700	(2000)	410	41	82
ALPHA-CHLORDANE	(3900)	1800	410	41	82
ENDOSULFAN I	(ND)	ND	410	41	82
4,4'-DDE	(260J)	160J	410	41	82
DIELDRIN	(290J)	260J	410	41	82
ENDRIN	(ND)	ND	410	41	82
4,4'-DDD	(ND)	ND	410	41	82
ENDOSULFAN II	(ND)	ND	410	41	82
4,4'-DDT	71J	(90J)	410	41	82
ENDRIN ALDEHYDE	(ND)	ND	410	72	82
ENDOSULFAN SULFATE	(ND)	ND	410	41	82
ENDRIN KETONE	(ND)	ND	410	41	82
METHOXYCHLOR	(ND)	ND	2000	410	820
TOXAPHENE	(ND)	ND	10000	1000	2000
TECHNICAL CHLORDANE	(23000)	20000	10000	2000	4100

SURROGATE PARAMETERS	RESULTS		SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	(ND)	ND	13.64	(0.000000*) | 0.000000*	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

3/17/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-029	Date Analyzed: 03/23/16 00:03
Lab Samp ID: C129-08	Dilution Factor: 1
Lab File ID: RC22034A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 1.4
Calib. Ref.: RC22023A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND UJ(5)	2.0	0.20	0.41
GAMMA-BHC (LINDANE)	(ND)	3.9	2.0	0.20	0.41
BETA-BHC	2.9	(ND)	2.0	0.20	0.41
HEPTACHLOR	(ND)	0.88J	2.0	0.20	0.41
DELTA-BHC	(ND)	0.33J	2.0	0.27	0.41
ALDRIN	(0.63J)	0.35J J(12)	2.0	0.20	0.41
HEPTACHLOR EPOXIDE	(ND)	ND	2.0	0.20	0.41
GAMMA-CHLORDANE	97E	(190E) R(22)	2.0	0.20	0.41
ALPHA-CHLORDANE	(200E)	170E ↓	2.0	0.20	0.41
ENDOSULFAN I	(ND)	ND	2.0	0.20	0.41
4,4'-DDE	10	(18) J(12)	2.0	0.20	0.41
DIELDRIN	98E	(150E) R(22)	2.0	0.20	0.41
ENDRIN	(ND)	5.3	2.0	0.20	0.41
4,4'-DDD	(ND)	ND	2.0	0.20	0.41
ENDOSULFAN II	(ND)	ND	2.0	0.20	0.41
4,4'-DDT	6.4	(9.5)	2.0	0.20	0.41
ENDRIN ALDEHYDE	(ND)	ND	2.0	0.35	0.41
ENDOSULFAN SULFATE	(ND)	ND	2.0	0.20	0.41
ENDRIN KETONE	(ND)	ND	2.0	0.20	0.41
METHOXYCHLOR	(ND)	ND	10	2.0	4.1
TOXAPHENE	(ND)	ND	51	5.1	10
TECHNICAL CHLORDANE	1500E	(1900E) R(22)	51	10	20

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	13.60 (13.63)	13.52	101 (101)	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

4/5/16

METHOD SW3550B/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/21/16 13:45
Sample ID: KCH067-029DL	Date Analyzed: 03/23/16 23:48
Lab Samp ID: C129-08I	Dilution Factor: 20
Lab File ID: RC22067A	Matrix : SOIL
Ext Btch ID: CPC019S	% Moisture : 1.4
Calib. Ref.: RC22057A	Instrument ID : F9

PARAMETERS	RESULTS (ug/kg)		LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ALPHA-BHC	(ND)	ND	41	4.1	8.1
GAMMA-BHC (LINDANE)	(ND)	ND	41	4.1	8.1
BETA-BHC	(ND)	ND	41	4.1	8.1
HEPTACHLOR	(ND)	ND	41	4.1	8.1
DELTA-BHC	(ND)	ND	41	5.5	8.1
ALDRIN	(ND)	ND	41	4.1	8.1
HEPTACHLOR EPOXIDE	(ND)	ND	41	4.1	8.1
GAMMA-CHLORDANE	200	(230)	41	4.1	8.1
ALPHA-CHLORDANE	(470)	210	41	4.1	8.1
ENDOSULFAN I	(ND)	8.2J	41	4.1	8.1
4,4'-DDE	(25J)	13J	41	4.1	8.1
DIELDRIN	(170)	170	41	4.1	8.1
ENDRIN	(ND)	ND	41	4.1	8.1
4,4'-DDD	(ND)	ND	41	4.1	8.1
ENDOSULFAN II	(ND)	ND	41	4.1	8.1
4,4'-DDT	6.2J	(11J)	41	4.1	8.1
ENDRIN ALDEHYDE	(ND)	ND	41	7.1	8.1
ENDOSULFAN SULFATE	(ND)	ND	41	4.1	8.1
ENDRIN KETONE	(ND)	ND	41	4.1	8.1
METHOXYCHLOR	(ND)	ND	200	41	81
TOXAPHENE	(ND)	ND	1000	100	200
TECHNICAL CHLORDANE	(2400)	2400	1000	200	410

SURROGATE PARAMETERS	RESULTS		SPK_AMT	% RECOVERY		QC LIMIT
TETRACHLORO-M-XYLENE	(14.85)	18.19	13.52	(110)	135*	42-129

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

METHOD SW3520C/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/17/16 16:30
Sample ID: KCH067-041	Date Analyzed: 03/22/16 17:36
Lab Samp ID: C129-18	Dilution Factor: 1.1
Lab File ID: RC22015A	Matrix : WATER
Ext Btch ID: CPC014W	% Moisture : NA
Calib. Ref.: RC22011A	Instrument ID : F9

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
ALPHA-BHC	(ND) | ND UJ(S)	0.11	0.0055	0.011
GAMMA-BHC (LINDANE)	(ND) | ND	0.11	0.0055	0.011
BETA-BHC	(ND) | 0.22	0.11	0.0077	0.011
HEPTACHLOR	(ND) | ND	0.11	0.0077	0.011
DELTA-BHC	(ND) | ND	0.11	0.0077	0.011
ALDRIN	(ND) | 0.044J	0.11	0.0055	0.011
HEPTACHLOR EPOXIDE	(ND) | ND	0.11	0.0055	0.011
GAMMA-CHLORDANE	(ND) | ND	0.11	0.0055	0.011
ALPHA-CHLORDANE	(ND) | ND	0.11	0.0055	0.011
ENDOSULFAN I	(ND) | ND	0.11	0.0088	0.011
4,4'-DDE	(ND) | ND	0.11	0.0055	0.011
DIELDRIN	(ND) | ND	0.11	0.0055	0.011
ENDRIN	(ND) | ND	0.11	0.0088	0.011
4,4'-DDD	(ND) | ND	0.11	0.0055	0.011
ENDOSULFAN II	(ND) | ND	0.11	0.0055	0.011
4,4'-DDT	(ND) | ND	0.11	0.0055	0.011
ENDRIN ALDEHYDE	(ND) | ND	0.11	0.0055	0.011
ENDOSULFAN SULFATE	(ND) | ND	0.11	0.0055	0.011
ENDRIN KETONE	(ND) | ND	0.11	0.0055	0.011
METHOXYCHLOR	(ND) | ND	1.1	0.055	0.11
TOXAPHENE	(ND) | ND	2.2	0.28	0.55
TECHNICAL CHLORDANE	(ND) | ND	1.1	0.28	0.55

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.4331 | (0.4827)	0.4400	98.4 | (110)	44-124

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

SDG 17/16

METHOD SW3520C/8081A
PESTICIDES

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/17/16 16:30
Sample ID: KCH067-042	Date Analyzed: 03/22/16 17:56
Lab Samp ID: C129-19	Dilution Factor: 1.14
Lab File ID: RC22016A	Matrix : WATER
Ext Btch ID: CPC014W	% Moisture : NA
Calib. Ref.: RC22011A	Instrument ID : F9

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
ALPHA-BHC	(ND) | ND UJ(5)	0.11	0.0057	0.011
GAMMA-BHC (LINDANE)	(ND) | ND	0.11	0.0057	0.011
BETA-BHC	(ND) | ND	0.11	0.0080	0.011
HEPTACHLOR	(ND) | ND	0.11	0.0080	0.011
DELTA-BHC	(ND) | ND	0.11	0.0080	0.011
ALDRIN	(ND) | 0.028J	0.11	0.0057	0.011
HEPTACHLOR EPOXIDE	(ND) | ND	0.11	0.0057	0.011
GAMMA-CHLORDANE	(ND) | ND	0.11	0.0057	0.011
ALPHA-CHLORDANE	(ND) | ND	0.11	0.0057	0.011
ENDOSULFAN I	(ND) | ND	0.11	0.0091	0.011
4,4'-DDE	(ND) | ND	0.11	0.0057	0.011
DIELDRIN	(ND) | ND	0.11	0.0057	0.011
ENDRIN	(ND) | ND	0.11	0.0091	0.011
4,4'-DDD	(ND) | ND	0.11	0.0057	0.011
ENDOSULFAN II	(ND) | ND	0.11	0.0057	0.011
4,4'-DDT	(ND) | ND	0.11	0.0057	0.011
ENDRIN ALDEHYDE	(ND) | ND	0.11	0.0057	0.011
ENDOSULFAN SULFATE	(ND) | ND	0.11	0.0057	0.011
ENDRIN KETONE	(ND) | ND	0.11	0.0057	0.011
METHOXYCHLOR	(ND) | ND	1.1	0.057	0.11
TOXAPHENE	(ND) | ND	2.3	0.28	0.57
TECHNICAL CHLORDANE	(ND) | ND	1.1	0.28	0.57

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.4365 | (0.4695)	0.4560	95.7 | (103)	44-124

RL : Reporting limit
Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )

3/25/16

LDC #: 36282C3a
SDG #: 16C129
Laboratory: EMAX Laboratories Inc.

VALIDATION COMPLETENESS WORKSHEET
Standard/Full

Date: 5/10/16
Page: 1 of 2
Reviewer: F
2nd Reviewer: R

METHOD: GC Chlorinated Pesticides (EPA SW846 Method 8081A)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC Instrument Performance Check	A	
III.	Initial calibration/ICV	A / A	%RSD/ICV ≤20
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB= 17 SB=18'
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Compound quantitation/RL/LOQ/LODs	SW	Not reviewed for Standard validation.
XII.	Target compound identification	A	Not reviewed for Standard validation.
XIII.	System Performance	A	Not reviewed for Standard validation.
XIV.	Overall assessment of data	SW	

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

** Indicates sample underwent Full validation

	Client ID	Lab ID	Matrix	Date
1	KCH067-022	16C129-01	Soil	03/15/16
2	KCH067-022DL	16C129-01DL	Soil	03/15/16
3	KCH067-023	16C129-02	Soil	03/15/16
4	KCH067-023DL	16C129-02DL	Soil	03/15/16
5	KCH067-024	16C129-03	Soil	03/15/16
6	KCH067-024DL	16C129-03DL	Soil	03/15/16
7	KCH067-025	16C129-04	Soil	03/15/16
8	KCH067-025DL	16C129-04DL	Soil	03/15/16
9	KCH067-026**	16C129-05**	Soil	03/15/16
10	KCH067-026DL**	16C129-05DL**	Soil	03/15/16
11	KCH067-027	16C129-06	Soil	03/15/16
12	KCH067-027DL	16C129-06DL	Soil	03/15/16
13	KCH067-028	16C129-07	Soil	03/15/16
14	KCH067-028DL	16C129-07DL	Soil	03/15/16
15	KCH067-029	16C129-08	Soil	03/15/16

LDC #: 36282C3a

SDG #: 16C129

Laboratory: EMAX Laboratories Inc.

VALIDATION COMPLETENESS WORKSHEET

Standard/Full

Date: 5/10/16

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW846 Method 8081A)

	Client ID	Lab ID	Matrix	Date
16	KCH067-029DL	16C129-08DL	Soil	03/15/16
17	KCH067-041	16C129-18	Water	03/15/16
18	KCH067-042	16C129-19	Water	03/15/16
19	KCH067-022MS	16C129-01MS	Soil	03/15/16
20	KCH067-022MSD	16C129-01MSD	Soil	03/15/16
21				
22				
23				
24				
25				

Notes:

-	MBLKIW						
-	MB LK1S						

LDC #: 36282C30a

VALIDATION FINDINGS CHECKLIST

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

Method: Pesticides (EPA SW 846 Method 8081)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?	✓			
Were Evaluation mix standards analyzed prior to the initial calibration and at beginning of each 12-hour shift?	✓			
Were endrin and 4,4'-DDT breakdowns ≤ 15% for individual breakdown in the Evaluation mix standards?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were the RT windows properly established?	✓			
IIIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?		✓		
Were all the retention times within the acceptance windows?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes/Internal Standards				
Were all surrogate percent recovery (%R) within the QC limits?		✓		

LDC #: 36282C3a

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer: A

Validation Area	Yes	No	NA	Findings/Comments
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recovery (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
Were internal standard area counts within ± 50% of the average area calculated during calibration?		FT A	✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?	✓			
Were relative percent difference (RPD) of the results between two columns ≤ 40%?	✓	✓		
XII. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPA SW 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. Arochlor 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:_____

LDC #: 36282C3a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? ___%D or ___%R
Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / %R validation criteria of ≤20.0% / 80-120%?
Level IV Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

code = 5

#	Date	Standard ID	Detector/ Column	Compound	%D (Limit ≤ 20.0)	RT (limit)	Associated Samples	Qualifications
	3/22/16 16:15	CCV	RTX CLP2	A	22		All Water + MBLKS	J dil/UJ/A (ND)
	3/22/16 20:18	CCV	RTX CLP2	A	23		1, 3, 5, 7, 11, 15 19/20	J/UJ/A (ND)
	3/23/16 20:25	CCV	RTX CLP2	A	31		2, 4, 6, 8, 12, 13, 16	J/UJ/A (ND)
				D	25			
	3/24/16 20:03	CCV	RTX CLP1	T	34		9, 10, 14	J/UJ/A (ND+RJT)
				S	24			
				H	21			
			RTX CLP2	F	22			

LDC #: 36282 c3a

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

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

METHOD: ✓ **GC** __ **HPLC**

Are surrogates required by the method? Yes____ or No____.

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

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	10, 14	surrogate	was diluted out	( )	no qual 75x DL
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
	16	✓ RTX CLP2	Y	135 (42-129)	no qual 20x DL
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 36282c3a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

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

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	19 + 20	I	-1200 (56-136)	-1300 (56-136)	( )	1, 2	no qual parent > 4x spike Amt
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 36289c3a

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: FT
2nd Reviewer: AC

METHOD: ✓ GC __ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

code = 20

#	Associated Samples	Compound Name	Findings	Qualifications
	1	I, HH	x'd cal Range	J all / Δ
	3, 9, 13	S, T, HH		
	5	S, T		
	7	S, T, J, θ, HH		
	FT 9, 11, 15	S, T, I, HH	↓	↓
	FT 15	FT I		

Comments: See sample calculation verification worksheet for recalculations

LDC #: 36282 C3a

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: FT
2nd Reviewer: AC

METHOD: V **GC** __ **HPLC**

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

code = 12

#	Associated Samples	Compound Name	Findings (%RPD Bet 2 col ≤ 40)	Qualifications
	1	T	52	J det / Δ
		I	78	
		θ	45	
		HH	45	
	2	T	75	
		S	67	
	3	T	84	
		I	50	
		θ	89	
		HH	63	
	4	S	52	
		θ	49	✓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 36282C3a

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: FT
2nd Reviewer: M

METHOD: ✓ **GC** __ **HPLC**

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

code = 12

#	Associated Samples	Compound Name	% RPD Bet 2 col ≤ 40 Findings	Qualifications
	5	T	42	J det /A
		S	50	
		O	79	
	6	S	73	
	7	T	90	
		J	85	
		O	83	
		HH	69	
	8	S	78	
		I	151	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 36282C3a

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: FT
2nd Reviewer: DC

METHOD: ✓ GC ___ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

wells = 12

#	Associated Samples	Compound Name	% RPD Bet 2 col ≤40 Findings	Qualifications
	9	T	144	J all / A
		S	147	
		I	95	
		K	102	
		HH	52	
	10	S	51	
	11	T	82	
		S	81	
			81	
		HH	56	
	~~12~~	~~S~~	~~70~~ FT	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 36282 C3a

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: FT
2nd Reviewer: MC

METHOD: ✓ GC __ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results? code - 12

#	Associated Samples	Compound Name	Findings (% RPD Bet 2 col ≤40)	Qualifications
	12	S	70	J (all) /A
	14	S	74	
		J	48	
	15	F	57	
		P	65	
		J	57	
		I	42	
	16	S	76	
		J	63	
		O	56	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 36282C3a

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

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

METHOD: ✓ **GC** __ **HPLC**

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

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

code = 22

#	Associated samples	Compounds	Findings	Qualifications
	1	I, HH	x'd cal Range	R/Δ
	2	all except I, HH	diluted	
	3, 9, 13	S, T, HH	x'd cal Range	
	4, 10, 14	all except S, T, HH	diluted	
	5	S, T	x'd cal Range	
	6	all except S, T	diluted	
	7	S, T, J, O, HH	x'd cal Range	
	8	all except S, T, J, O, HH	diluted	↓

Comments: _____

LDC #: 36282c3a

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: FT
2nd Reviewer: MC

METHOD: ✓ **GC** __ **HPLC**

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

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

wbl = 22

#	Associated samples	Compounds	Findings	Qualifications
	11, 15	S, T, I, HH	x'd cal Range	R/Δ
	12, 16	all except S, T, I, HH	diluted	J

Comments: _____

LDC #: 36282C3a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

METHOD: GC Pesticides (EPA SW 846 Method 8081)

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (20 std)/200	Recalculated CF (20 std)/200	Reported CF (initial)	Recalculated CF (intial)	Reported %RSD	Recalculated %RSD
1	ICA L	1/21/16	endosulfan I	431064	431064	419333.4	419333.4	12.1	12.1
	RTX cup1		Methoxychlor	146220	146220	164669.2	164669.2	15.4	15.4
2	RTX cup2		↓	107259	107259	105819.2	105819.2	5.8	5.8
				44563	44563	45652.3	45652.3	5.4	5.4
3									
4									

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

LDC #: 36282C 3a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC Pesticides (EPA SW 846 Method 8081)

Percent difference (%D) = 100 * (N - C)/N

Where: N = Initial Calibration Factor or Nominal Amount (ng)
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount (ng)

Standard ID	Calibration Date/Time	Compound	Average CF/ CCV Conc	Reported CF/Conc CCV	Recalculated CF/Conc CCV	Reported %D	Recalculated %D
CCV 16:15	3/22/16	endosulfan I RTx CVP1	20.0	19.17	19.17	4	4
		methoxychlor RTx CVP2	200.0	203.87	203.87	2	2
			20.0	21.25	21.25	6	6
			200.0	207.31	207.31	4	4
CCV 20:18	3/22/16	↓	↓	20.24	20.24	1	1
				226.17	226.17	13	13
				21.74	21.74	9	9
				226.34	226.34	13	13
CCV 20:03	3/24/16	↓	↓	15.80	15.80	21	21
				199.76	199.76	0	0
				17.07	17.07	15	15
				207.96	207.96	4	4

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

LDC #: 36282c3a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer: A

METHOD: GC Pesticides (EPA SW 846 Method 8081)

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 9

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Tetrachloro-m-xylene	RTX api	40	35.467	88.7	88.7	0
Tetrachloro-m-xylene	↓	↓	38.981	97.5	97.5	0
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Notes:

LDC #: 36282C3a

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer: A

METHOD: GC Pesticides (EPA SW 846 Method 8081)

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

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = I MS - MSD I * 2/(MS + MSD)

MS = Matrix spike percent recovery

MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 19 + 20

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	6.77	6.77	ND	5.02	5.04	74	74	74	74	0	0
4,4'-DDT	↓	↓	9.6	17.9	16.7	123	123	105	105	7	7

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

LDC #: 36282c3a

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

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

METHOD: GC Pesticides (EPA SW 846 Method 8081A)

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

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = I LCS - LCSD I * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: CP a0195L / sa

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	6.67	6.67	8.32	8.33	125	125	125	125	0	0
4,4'-DDT	↓	↓	8.33	8.17	125	125	122	122	2	2

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

LDC #: 36282c3a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

METHOD: GC Pesticides (EPA SW 846 Method 8081A)

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

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

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #9 , 4,4' DDT

Conc. = $\frac{(12119673)\ (10)\ (20)}{(312997.5)\ (30)\ (0.961)}$

= 270 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 11, 2016

Parameters: Polychlorinated Biphenyls

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C129

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-042	16C129-19	Water	03/15/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An 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.

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

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.

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-042 was identified as a source blank. No contaminants were found.

VI. Surrogates

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

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level III validation.

XI. Target Compound Identification

Raw data were not reviewed for Level III validation.

XII. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Polychlorinated Biphenyls - Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

METHOD SW3520C/8082
PCBs

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
Batch No. : 16C129	Date Extracted: 03/17/16 16:30
Sample ID: KCH067-042	Date Analyzed: 03/18/16 17:58
Lab Samp ID: C129-19	Dilution Factor: 1.14
Lab File ID: KC18014A	Matrix : WATER
Ext Btch ID: CPC014W	% Moisture : NA
Calib. Ref.: KC18004A	Instrument ID : GCT071

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
AROCLOR 1016	(ND)|ND	1.1	0.51	0.57
AROCLOR 1221	(ND)|ND	1.1	0.33	0.57
AROCLOR 1232	(ND)|ND	1.1	0.28	0.57
AROCLOR 1242	(ND)|ND	1.1	0.28	0.57
AROCLOR 1248	(ND)|ND	1.1	0.28	0.57
AROCLOR 1254	(ND)|ND	1.1	0.28	0.57
AROCLOR 1260	(ND)|ND	1.1	0.35	0.57

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
TETRACHLORO-M-XYLENE	0.4467|(0.4704)	0.4560	98.0|(103)	60-130

Left of | is related to first column ; Right of | related to second column
Final result indicated by ( )
* Out side of QC Limit

SL 3/17/16

LDC #: 36282C3b

SDG #: 16C129

Laboratory: EMAX Laboratories Inc.

VALIDATION COMPLETENESS WORKSHEET

Standard

Date: 5/10/16

Page: 1 of 1

Reviewer: EF

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / Δ	
II.	Initial calibration/ICV	A / Δ	
III.	Continuing calibration	Δ	
IV.	Laboratory Blanks	Δ	
V.	Field blanks	ND	SB = 1
VI.	Surrogate spikes	Δ	
VII.	Matrix spike/Matrix spike duplicates	N	QC Sample
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation/RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII	Overall assessment of data	Δ	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-042	16C129-19	Water	03/15/16
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

	MBLK1W						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 24, 2016

Parameters: Metals

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C129

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-032**	16C129-09**	Soil	03/15/16
KCH067-033	16C129-10	Soil	03/15/16
KCH067-034	16C129-11	Soil	03/15/16
KCH067-035	16C129-12	Soil	03/15/16
KCH067-036	16C129-13	Soil	03/15/16
KCH067-037	16C129-14	Soil	03/15/16
KCH067-038	16C129-15	Soil	03/15/16
KCH067-039	16C129-16	Soil	03/15/16
KCH067-040	16C129-17	Soil	03/15/16
KCH067-041	16C129-18	Water	03/15/16
KCH067-042	16C129-19	Water	03/15/16
KCH067-035MS	16C129-12MS	Soil	03/15/16
KCH067-035MSD	16C129-12MSD	Soil	03/15/16
KCH067-041MS	16C129-18MS	Water	03/15/16
KCH067-041MSD	16C129-18MSD	Water	03/15/16
KCH067-032DL**	16C129-09DL**	Soil	03/15/16
KCH067-037DL	16C129-14DL	Soil	03/15/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A
Mercury by EPA SW 846 Method 7470A

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

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

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

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

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Laboratory Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Copper	0.308 ug/L	All water samples in SDG 16C129
ICB/CCB	Molybdenum	0.203 ug/L	KCH067-032** KCH067-033 KCH067-034 KCH067-035

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
KCH067-042	Copper	0.811 ug/L	0.811U ug/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
KCH067-033	Molybdenum	0.324 mg/Kg	0.324U mg/Kg
KCH067-034	Molybdenum	0.195 mg/Kg	0.195U mg/Kg
KCH067-035	Molybdenum	0.310 mg/Kg	0.310U mg/Kg

VI. Field Blanks

Sample KCH067-041 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
KCH067-041	03/15/16	Aluminum Barium Boron Calcium Chromium Copper Iron Lead Magnesium Manganese Nickel Potassium Sodium Zinc	21.6 ug/L 1.09 ug/L 4.36 ug/L 122 ug/L 0.284 ug/L 1.34 ug/L 27.5 ug/L 0.570 ug/L 17.7 ug/L 0.800 ug/L 0.156 ug/L 156 ug/L 152 ug/L 8.14 ug/L	All soil samples in SDG 16C129

Sample KCH067-042 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
KCH067-042	03/15/16	Barium Boron Calcium Chromium Copper Lead Magnesium Sodium	0.277 ug/L 4.00 ug/L 34.7 ug/L 0.101 ug/L 0.811 ug/L 0.0528 ug/L 7.51 ug/L 35.3 ug/L	KCH067-041

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
KCH067-033	Boron	8.19 mg/Kg	8.19U mg/Kg
KCH067-034	Boron Sodium	5.65 mg/Kg 94.9 mg/Kg	5.65U mg/Kg 94.9U mg/Kg
KCH067-035	Boron Sodium	5.36 mg/Kg 71.3 mg/Kg	5.36U mg/Kg 71.3U mg/Kg
KCH067-036	Boron Sodium	6.06 mg/Kg 77.3 mg/Kg	6.06U mg/Kg 77.3U mg/Kg
KCH067-037	Boron Sodium	6.18 mg/Kg 81.9 mg/Kg	6.18U mg/Kg 81.9U mg/Kg
KCH067-038	Boron Sodium	5.40 mg/Kg 77.5 mg/Kg	5.40U mg/Kg 77.5U mg/Kg
KCH067-039	Boron Sodium	5.75 mg/Kg 85.8 mg/Kg	5.75U mg/Kg 85.8U mg/Kg
KCH067-040	Boron Sodium	5.70 mg/Kg 85.7 mg/Kg	5.70U mg/Kg 85.7U mg/Kg
KCH067-041	Boron Chromium Lead Magnesium	4.36 ug/L 0.284 ug/L 0.570 ug/L 17.7 ug/L	5.00U ug/L 0.284U ug/L 0.570U ug/L 17.7U ug/L
KCH067-037DL	Sodium	70.6 mg/Kg	97.4U mg/Kg

VII. Matrix Spike/Matrix Spike Duplicates

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

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
KCH067-035MS/MSD (KCH067-035)	Aluminum Calcium Manganese	135 (78-124) 132 (86-118) 120 (85-116)	132 (78-124) 132 (86-118) -	J+ (all detects) J+ (all detects) J+ (all detects)	A
KCH067-035MS/MSD (KCH067-035)	Vanadium	-	73 (82-116)	J- (all detects)	A

For KCH067-035MS/MSD, no data were qualified for Barium and Iron percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

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

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. The analysis criteria were met.

X. Laboratory Control Samples

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

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Level IV validation with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
KCH067-032**	Boron	Sample result exceeded linear range.	Reported result should be within linear range.	J (all detects)	A
KCH067-037	Iron	Sample result exceeded linear range.	Reported result should be within linear range.	J (all detects)	A

Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Analyte	Flag	A or P
KCH067-032**	Boron	R	A
KCH067-037	Iron	R	A
KCH067-032DL**	All analytes except Boron	R	A
KCH067-037DL	All analytes except Iron	R	A

Due to MS/MSD %R, data were qualified as estimated in one sample.

Due to laboratory blank contamination, data were qualified as not detected in four samples.

Due to equipment blank and source blank contamination, data were qualified as not detected in ten samples.

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

China Lake CTO 067
Metals - Data Qualification Summary - SDG 16C129

Sample	Analyte	Flag	A or P	Reason (Code)
KCH067-035	Aluminum Calcium Manganese	J+ (all detects) J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (8)
KCH067-035	Vanadium	J- (all detects)	A	Matrix spike/Matrix spike duplicate (%R) (8)
KCH067-032**	Boron	R	A	Overall assessment of data (22)
KCH067-037	Iron	R	A	Overall assessment of data (22)
KCH067-032DL**	All analytes except Boron	R	A	Overall assessment of data (22)
KCH067-037DL	All analytes except Iron	R	A	Overall assessment of data (22)

China Lake CTO 067
Metals - Laboratory Blank Data Qualification Summary - SDG 16C129

Sample	Analyte	Modified Final Concentration	A or P	Code
KCH067-042	Copper	0.811U ug/L	A	7
KCH067-033	Molybdenum	0.324U mg/Kg	A	7
KCH067-034	Molybdenum	0.195U mg/Kg	A	7
KCH067-035	Molybdenum	0.310U mg/Kg	A	7

China Lake CTO 067
Metals - Field Blank Data Qualification Summary - SDG 16C129

Sample	Analyte	Modified Final Concentration	A or P	Code
KCH067-033	Boron	8.19U mg/Kg	A	6
KCH067-034	Boron Sodium	5.65U mg/Kg 94.9U mg/Kg	A	6

Sample	Analyte	Modified Final Concentration	A or P	Code
KCH067-035	Boron Sodium	5.36U mg/Kg 71.3U mg/Kg	A	6
KCH067-036	Boron Sodium	6.06U mg/Kg 77.3U mg/Kg	A	6
KCH067-037	Boron Sodium	6.18U mg/Kg 81.9U mg/Kg	A	6
KCH067-038	Boron Sodium	5.40U mg/Kg 77.5U mg/Kg	A	6
KCH067-039	Boron Sodium	5.75U mg/Kg 85.8U mg/Kg	A	6
KCH067-040	Boron Sodium	5.70U mg/Kg 85.7U mg/Kg	A	6
KCH067-041	Boron Chromium Lead Magnesium	5.00U ug/L 0.284U ug/L 0.570U ug/L 17.7U ug/L	A	6

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
SDG NO.	: 16C129	Date Extracted:	03/23/16 15:08
Sample ID	: KCH067-032	Date Analyzed:	03/28/16 13:36
Lab Samp ID	: C129-09	Dilution Factor:	0.971
Lab File ID	: 98C11021	Matrix :	SOIL
Ext Btch ID	: IMC040S	% Moisture :	1.7
Calib. Ref.	: 98C11016	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	5650	98.8	9.88	19.8
Antimony	0.890	0.494	0.0988	0.198
Arsenic	6.11	0.494	0.0494	0.0988
Barium	35.2	0.494	0.0711	0.0988
Beryllium	0.203J	0.494	0.0494	0.0988
Boron	25.1E R(22)	9.88	2.47	4.94
Cadmium	0.779	0.494	0.0563	0.0988
Calcium	18200	98.8	16.8	19.8
Chromium	8.04	0.494	0.0494	0.0988
Cobalt	3.16	0.494	0.0494	0.0988
Copper	8.87	0.494	0.0988	0.198
Iron	10200	98.8	4.94	9.88
Lead	23.9	0.494	0.0494	0.0988
Magnesium	4140	98.8	9.88	19.8
Manganese	157	0.494	0.151	0.198
Molybdenum	0.802	0.494	0.0988	0.198
Nickel	4.17	0.494	0.0622	0.0988
Potassium	2490	98.8	9.88	19.8
Selenium	0.0630J	0.494	0.0494	0.0988
Silver	0.181J	0.494	0.0494	0.0988
Sodium	454	98.8	9.88	19.8
Thallium	0.0666J	0.494	0.0494	0.0988
Vanadium	20.7	0.494	0.188	0.247
Zinc	385	1.98	0.675	0.988

5/17/16

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
SDG NO.	: 16C129	Date Extracted:	03/23/16 15:08
Sample ID:	KCH067-032DL	Date Analyzed:	03/28/16 17:49
Lab Samp ID:	C129-09I	Dilution Factor:	1.94
Lab File ID:	98C11078	Matrix :	SOIL
Ext Btch ID:	IMC040S	% Moisture :	1.7
Calib. Ref.:	98C11074	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	5640 R22	197	19.7	39.5
Antimony	0.869J	0.987	0.197	0.395
Arsenic	6.23	0.987	0.0987	0.197
Barium	34.5	0.987	0.142	0.197
Beryllium	0.205J	0.987	0.0987	0.197
Boron	25.4	19.7	4.93	9.87
Cadmium	0.726J R22	0.987	0.112	0.197
Calcium	19100	197	33.6	39.5
Chromium	8.08	0.987	0.0987	0.197
Cobalt	3.24	0.987	0.0987	0.197
Copper	9.05	0.987	0.197	0.395
Iron	10300	197	9.87	19.7
Lead	23.9	0.987	0.0987	0.197
Magnesium	4110	197	19.7	39.5
Manganese	162	0.987	0.302	0.395
Molybdenum	0.775J	0.987	0.197	0.395
Nickel	4.22	0.987	0.124	0.197
Potassium	2570	197	19.7	39.5
Selenium	ND	0.987	0.0987	0.197
Silver	0.174J	0.987	0.0987	0.197
Sodium	454	197	19.7	39.5
Thallium	ND	0.987	0.0987	0.197
Vanadium	20.8	0.987	0.375	0.493
Zinc	387	3.95	1.35	1.97

4/7/16

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
SDG NO.	: 16C129	Date Extracted:	03/23/16 15:08
Sample ID:	KCH067-033	Date Analyzed:	03/28/16 13:40
Lab Samp ID:	C129-10	Dilution Factor:	0.966
Lab File ID:	98C11022	Matrix :	SOIL
Ext Btch ID:	IMC040S	% Moisture :	1.5
Calib. Ref.:	98C11016	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	4010	98.1	9.81	19.6
Antimony	0.437J	0.490	0.0981	0.196
Arsenic	2.68	0.490	0.0490	0.0981
Barium	33.5	0.490	0.0706	0.0981
Beryllium	0.151J	0.490	0.0490	0.0981
Boron	8.19J U(6)	9.81	2.45	4.90
Cadmium	0.163J	0.490	0.0559	0.0981
Calcium	7780	98.1	16.7	19.6
Chromium	4.33	0.490	0.0490	0.0981
Cobalt	2.07	0.490	0.0490	0.0981
Copper	5.55	0.490	0.0981	0.196
Iron	6710	98.1	4.90	9.81
Lead	2.74	0.490	0.0490	0.0981
Magnesium	2420	98.1	9.81	19.6
Manganese	111	0.490	0.150	0.196
Molybdenum	0.324J U(T)	0.490	0.0981	0.196
Nickel	2.52	0.490	0.0618	0.0981
Potassium	1400	98.1	9.81	19.6
Selenium	ND	0.490	0.0490	0.0981
Silver	ND	0.490	0.0490	0.0981
Sodium	112	98.1	9.81	19.6
Thallium	ND	0.490	0.0490	0.0981
Vanadium	14.1	0.490	0.186	0.245
Zinc	24.8	1.96	0.670	0.981

5/17/16 9

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
SDG NO.	: 16C129	Date Extracted:	03/23/16 15:08
Sample ID:	KCH067-034	Date Analyzed:	03/28/16 13:45
Lab Samp ID:	C129-11	Dilution Factor:	0.966
Lab File ID:	98C11023	Matrix :	SOIL
Ext Btch ID:	IMC040S	% Moisture :	0.4
Calib. Ref.:	98C11016	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)		LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	2050		97.0	9.70	19.4
Antimony	0.179J		0.485	0.0970	0.194
Arsenic	2.79		0.485	0.0485	0.0970
Barium	111		0.485	0.0698	0.0970
Beryllium	0.0961J		0.485	0.0485	0.0970
Boron	5.65J	U(6)	9.70	2.42	4.85
Cadmium	0.0643J		0.485	0.0553	0.0970
Calcium	3850		97.0	16.5	19.4
Chromium	9.76		0.485	0.0485	0.0970
Cobalt	3.06		0.485	0.0485	0.0970
Copper	3.35		0.485	0.0970	0.194
Iron	13400		97.0	4.85	9.70
Lead	2.47		0.485	0.0485	0.0970
Magnesium	866		97.0	9.70	19.4
Manganese	54.7		0.485	0.148	0.194
Molybdenum	0.195J	U(7)	0.485	0.0970	0.194
Nickel	1.71		0.485	0.0611	0.0970
Potassium	729		97.0	9.70	19.4
Selenium	ND		0.485	0.0485	0.0970
Silver	0.0879J		0.485	0.0485	0.0970
Sodium	94.9J	U(6)	97.0	9.70	19.4
Thallium	ND		0.485	0.0485	0.0970
Vanadium	37.8		0.485	0.184	0.242
Zinc	9.51		1.94	0.662	0.970

4/17/16 R

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
SDG NO.	: 16C129	Date Extracted:	03/23/16 15:08
Sample ID:	KCH067-035	Date Analyzed:	03/28/16 14:15
Lab Samp ID:	C129-12	Dilution Factor:	0.976
Lab File ID:	98C11030	Matrix :	SOIL
Ext Btch ID:	IMC040S	% Moisture :	0.5
Calib. Ref.:	98C11028	Instrument ID :	T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	1970 J+(8)	98.1	9.81	19.6
Antimony	0.203J	0.490	0.0981	0.196
Arsenic	3.43	0.490	0.0490	0.0981
Barium	199	0.490	0.0706	0.0981
Beryllium	0.0978J	0.490	0.0490	0.0981
Boron	5.36J U(6)	9.81	2.45	4.90
Cadmium	0.0697J	0.490	0.0559	0.0981
Calcium	5040 J+(8)	98.1	16.7	19.6
Chromium	9.98	0.490	0.0490	0.0981
Cobalt	2.17	0.490	0.0490	0.0981
Copper	3.82	0.490	0.0981	0.196
Iron	15700	98.1	4.90	9.81
Lead	3.05	0.490	0.0490	0.0981
Magnesium	948	98.1	9.81	19.6
Manganese	57.2 J+(8)	0.490	0.150	0.196
Molybdenum	0.310J U(7)	0.490	0.0981	0.196
Nickel	1.88	0.490	0.0618	0.0981
Potassium	763	98.1	9.81	19.6
Selenium	ND	0.490	0.0490	0.0981
Silver	ND	0.490	0.0490	0.0981
Sodium	71.3J U(6)	98.1	9.81	19.6
Thallium	ND	0.490	0.0490	0.0981
Vanadium	42.1 J-(8)	0.490	0.186	0.245
Zinc	8.51	1.96	0.670	0.981

4/17/16 Y

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
SDG NO.	: 16C129	Date Extracted:	03/23/16 15:08
Sample ID	: KCH067-036	Date Analyzed:	03/28/16 14:24
Lab Samp ID	: C129-13	Dilution Factor:	0.98
Lab File ID	: 98C11032	Matrix	: SOIL
Ext Btch ID	: IMC040S	% Moisture	: 2.3
Calib. Ref.	: 98C11028	Instrument ID	: T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	2530	100	10.0	20.1
Antimony	0.197J	0.502	0.100	0.201
Arsenic	3.20	0.502	0.0502	0.100
Barium	230	0.502	0.0722	0.100
Beryllium	0.107J	0.502	0.0502	0.100
Boron	6.06J U16)	10.0	2.51	5.02
Cadmium	0.0824J	0.502	0.0572	0.100
Calcium	7270	100	17.1	20.1
Chromium	11.5	0.502	0.0502	0.100
Cobalt	2.13	0.502	0.0502	0.100
Copper	3.82	0.502	0.100	0.201
Iron	17600	100	5.02	10.0
Lead	2.73	0.502	0.0502	0.100
Magnesium	1280	100	10.0	20.1
Manganese	72.2	0.502	0.153	0.201
Molybdenum	0.228J	0.502	0.100	0.201
Nickel	2.01	0.502	0.0632	0.100
Potassium	838	100	10.0	20.1
Selenium	ND	0.502	0.0502	0.100
Silver	0.0585J	0.502	0.0502	0.100
Sodium	77.3J U16)	100	10.0	20.1
Thallium	ND	0.502	0.0502	0.100
Vanadium	46.8	0.502	0.191	0.251
Zinc	10.1	2.01	0.685	1.00

5/17/16

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
SDG NO.	: 16C129	Date Extracted:	03/23/16 15:08
Sample ID:	KCH067-037	Date Analyzed:	03/28/16 14:29
Lab Samp ID:	C129-14	Dilution Factor:	0.957
Lab File ID:	98C11033	Matrix :	SOIL
Ext Btch ID:	IMC040S	% Moisture :	1.6
Calib. Ref.:	98C11028	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	2630	97.3	9.73	19.5
Antimony	0.307J	0.486	0.0973	0.195
Arsenic	4.79	0.486	0.0486	0.0973
Barium	253	0.486	0.0700	0.0973
Beryllium	0.112J	0.486	0.0486	0.0973
Boron	6.18J U(6)	9.73	2.43	4.86
Cadmium	0.105J	0.486	0.0554	0.0973
Calcium	6850	97.3	16.5	19.5
Chromium	27.0	0.486	0.0486	0.0973
Cobalt	3.74	0.486	0.0486	0.0973
Copper	4.62	0.486	0.0973	0.195
Iron	38000E R22	97.3	4.86	9.73
Lead	4.61	0.486	0.0486	0.0973
Magnesium	1430	97.3	9.73	19.5
Manganese	105	0.486	0.149	0.195
Molybdenum	0.383J	0.486	0.0973	0.195
Nickel	3.44	0.486	0.0613	0.0973
Potassium	909	97.3	9.73	19.5
Selenium	0.0573J	0.486	0.0486	0.0973
Silver	ND	0.486	0.0486	0.0973
Sodium	81.9J U(6)	97.3	9.73	19.5
Thallium	ND	0.486	0.0486	0.0973
Vanadium	111	0.486	0.185	0.243
Zinc	13.7	1.95	0.664	0.973

5/17/16 R

7011

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
SDG NO.	: 16C129	Date Extracted:	03/23/16 15:08
Sample ID:	KCH067-037DL	Date Analyzed:	03/28/16 17:54
Lab Samp ID:	C129-14I	Dilution Factor:	4.79
Lab File ID:	98C11079	Matrix :	SOIL
Ext Btch ID:	IMC040S	% Moisture :	1.6
Calib. Ref.:	98C11074	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	2690 R22	487	48.7	97.4
Antimony	ND	2.43	0.487	0.974
Arsenic	5.04	2.43	0.243	0.487
Barium	249	2.43	0.350	0.487
Beryllium	ND	2.43	0.243	0.487
Boron	ND	48.7	12.2	24.3
Cadmium	ND	2.43	0.277	0.487
Calcium	7220	487	82.8	97.4
Chromium	27.0	2.43	0.243	0.487
Cobalt	3.88	2.43	0.243	0.487
Copper	4.77	2.43	0.487	0.974
Iron	39700	487	24.3	48.7
Lead	4.76 R22	2.43	0.243	0.487
Magnesium	1450	487	48.7	97.4
Manganese	110	2.43	0.745	0.974
Molybdenum	ND	2.43	0.487	0.974
Nickel	3.54	2.43	0.307	0.487
Potassium	913	487	48.7	97.4
Selenium	ND	2.43	0.243	0.487
Silver	ND	2.43	0.243	0.487
Sodium	70.6J	487	48.7	97.4
Thallium	ND	2.43	0.243	0.487
Vanadium	108	2.43	0.925	1.22
Zinc	14.7	9.74	3.32	4.87

4/17/16

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
SDG NO.	: 16C129	Date Extracted:	03/23/16 15:08
Sample ID	: KCH067-038	Date Analyzed:	03/28/16 14:33
Lab Samp ID	: C129-15	Dilution Factor:	0.985
Lab File ID	: 98C11034	Matrix	: SOIL
Ext Btch ID	: IMC040S	% Moisture	: 1.3
Calib. Ref.	: 98C11028	Instrument ID	: T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	2120	99.8	9.98	20.0
Antimony	0.156J	0.499	0.0998	0.200
Arsenic	3.31	0.499	0.0499	0.0998
Barium	17.2	0.499	0.0719	0.0998
Beryllium	0.0788J	0.499	0.0499	0.0998
Boron	5.40J U(6)	9.98	2.49	4.99
Cadmium	0.0580J	0.499	0.0569	0.0998
Calcium	6350	99.8	17.0	20.0
Chromium	6.16	0.499	0.0499	0.0998
Cobalt	1.56	0.499	0.0499	0.0998
Copper	3.49	0.499	0.0998	0.200
Iron	8850	99.8	4.99	9.98
Lead	2.68	0.499	0.0499	0.0998
Magnesium	1330	99.8	9.98	20.0
Manganese	51.8	0.499	0.153	0.200
Molybdenum	0.200J	0.499	0.0998	0.200
Nickel	1.45	0.499	0.0629	0.0998
Potassium	688	99.8	9.98	20.0
Selenium	ND	0.499	0.0499	0.0998
Silver	0.0867J	0.499	0.0499	0.0998
Sodium	77.5J U(6)	99.8	9.98	20.0
Thallium	ND	0.499	0.0499	0.0998
Vanadium	22.9	0.499	0.190	0.249
Zinc	10.5	2.00	0.682	0.998

5/17/16

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
SDG NO.	: 16C129	Date Extracted:	03/23/16 15:08
Sample ID:	KCH067-039	Date Analyzed:	03/28/16 14:37
Lab Samp ID:	C129-16	Dilution Factor:	0.971
Lab File ID:	98C11035	Matrix :	SOIL
Ext Btch ID:	IMC040S	% Moisture :	1.1
Calib. Ref.:	98C11028	Instrument ID :	T-I98

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	2180	98.2	9.82	19.6
Antimony	0.143J	0.491	0.0982	0.196
Arsenic	3.02	0.491	0.0491	0.0982
Barium	19.0	0.491	0.0707	0.0982
Beryllium	0.0893J	0.491	0.0491	0.0982
Boron	5.75J U(6)	9.82	2.45	4.91
Cadmium	0.0645J	0.491	0.0560	0.0982
Calcium	7370	98.2	16.7	19.6
Chromium	3.91	0.491	0.0491	0.0982
Cobalt	1.35	0.491	0.0491	0.0982
Copper	2.94	0.491	0.0982	0.196
Iron	5740	98.2	4.91	9.82
Lead	2.10	0.491	0.0491	0.0982
Magnesium	1370	98.2	9.82	19.6
Manganese	51.1	0.491	0.150	0.196
Molybdenum	0.216J	0.491	0.0982	0.196
Nickel	1.26	0.491	0.0619	0.0982
Potassium	708	98.2	9.82	19.6
Selenium	ND	0.491	0.0491	0.0982
Silver	0.128J	0.491	0.0491	0.0982
Sodium	85.8J U(6)	98.2	9.82	19.6
Thallium	ND	0.491	0.0491	0.0982
Vanadium	14.1	0.491	0.187	0.245
Zinc	8.24	1.96	0.671	0.982

5/17/16 9

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
SDG NO.	: 16C129	Date Extracted:	03/23/16 15:08
Sample ID	: KCH067-040	Date Analyzed:	03/28/16 14:42
Lab Samp ID	: C129-17	Dilution Factor:	0.971
Lab File ID	: 98C11036	Matrix	: SOIL
Ext Btch ID	: IMC040S	% Moisture	: 1.0
Calib. Ref.	: 98C11028	Instrument ID	: T-198

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
Aluminum	2260	98.1	9.81	19.6
Antimony	0.143J	0.490	0.0981	0.196
Arsenic	3.09	0.490	0.0490	0.0981
Barium	21.5	0.490	0.0706	0.0981
Beryllium	0.0920J	0.490	0.0490	0.0981
Boron	5.70J U(6)	9.81	2.45	4.90
Cadmium	0.0621J	0.490	0.0559	0.0981
Calcium	6600	98.1	16.7	19.6
Chromium	9.16	0.490	0.0490	0.0981
Cobalt	1.67	0.490	0.0490	0.0981
Copper	4.02	0.490	0.0981	0.196
Iron	11700	98.1	4.90	9.81
Lead	2.44	0.490	0.0490	0.0981
Magnesium	1390	98.1	9.81	19.6
Manganese	70.5	0.490	0.150	0.196
Molybdenum	0.192J	0.490	0.0981	0.196
Nickel	1.61	0.490	0.0618	0.0981
Potassium	747	98.1	9.81	19.6
Selenium	ND	0.490	0.0490	0.0981
Silver	0.312J	0.490	0.0490	0.0981
Sodium	85.7J U(6)	98.1	9.81	19.6
Thallium	ND	0.490	0.0490	0.0981
Vanadium	31.4	0.490	0.186	0.245
Zinc	9.11	1.96	0.670	0.981

5/17/16

METHOD SW6020A
METALS BY ICP-MS

Client : KLEINFELDER	Date Collected: 03/15/16
Project : NAWS CHINA LAKE, CTO 067	Date Received: 03/17/16
SDG NO. : 16C129	Date Extracted: 03/23/16 11:55
Sample ID: KCH067-041	Date Analyzed: 03/28/16 18:56
Lab Samp ID: C129-18	Dilution Factor: 1
Lab File ID: 98C11093	Matrix : WATER
Ext Btch ID: IMC039W	% Moisture : NA
Calib. Ref.: 98C11085	Instrument ID : T-I98

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Aluminum	21.6J	100	10.0	20.0
Antimony	ND	1.00	0.250	0.500
Arsenic	ND	1.00	0.100	0.200
Barium	1.09	1.00	0.250	0.500
Beryllium	ND	1.00	0.0500	0.100
Boron	4.36J ≤ 5.00 U	10.0 (6)	2.50	5.00
Cadmium	ND	1.00	0.100	0.200
Calcium	122	100	13.0	25.0
Chromium	0.284J U (6)	1.00	0.100	0.200
Cobalt	ND	1.00	0.100	0.200
Copper	1.34	1.00	0.250	0.500
Iron	27.5J	100	5.00	10.0
Lead	0.570J U (6)	1.00	0.0500	0.100
Magnesium	17.7J U (6)	100	5.00	10.0
Manganese	0.800J	1.00	0.100	0.200
Molybdenum	ND	2.00	0.250	0.500
Nickel	0.156J	1.00	0.100	0.200
Potassium	156	100	10.0	20.0
Selenium	ND	1.00	0.150	0.300
Silver	ND	1.00	0.100	0.200
Sodium	152	100	25.0	50.0
Thallium	ND	1.00	0.100	0.200
Vanadium	ND	1.00	0.250	0.500
Zinc	8.14J	20.0	5.00	10.0

5/17/16 J

METHOD SW6020A
METALS BY ICP-MS

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
SDG NO.	: 16C129	Date Extracted:	03/23/16 11:55
Sample ID:	KCH067-042	Date Analyzed:	03/28/16 19:05
Lab Samp ID:	C129-19	Dilution Factor:	1
Lab File ID:	98C11095	Matrix	: WATER
Ext Btch ID:	IMC039W	% Moisture	: NA
Calib. Ref.:	98C11085	Instrument ID	: T-I98

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
Aluminum	ND	100	10.0	20.0
Antimony	ND	1.00	0.250	0.500
Arsenic	ND	1.00	0.100	0.200
Barium	0.277J	1.00	0.250	0.500
Beryllium	ND	1.00	0.0500	0.100
Boron	4.00J	10.0	2.50	5.00
Cadmium	ND	1.00	0.100	0.200
Calcium	34.7J	100	13.0	25.0
Chromium	0.101J	1.00	0.100	0.200
Cobalt	ND	1.00	0.100	0.200
Copper	0.811J U(7)	1.00	0.250	0.500
Iron	ND	100	5.00	10.0
Lead	0.0528J	1.00	0.0500	0.100
Magnesium	7.51J	100	5.00	10.0
Manganese	ND	1.00	0.100	0.200
Molybdenum	ND	2.00	0.250	0.500
Nickel	ND	1.00	0.100	0.200
Potassium	ND	100	10.0	20.0
Selenium	ND	1.00	0.150	0.300
Silver	ND	1.00	0.100	0.200
Sodium	35.3J	100	25.0	50.0
Thallium	ND	1.00	0.100	0.200
Vanadium	ND	1.00	0.250	0.500
Zinc	ND	20.0	5.00	10.0

8/25/16

METHOD SW7470A
MERCURY BY COLD VAPOR

Client : KLEINFELDER
Project : NAWS CHINA LAKE, CTO 067
Batch No. : 16C129

Matrix : WATER
InstrumentID : 47

CLIENT SAMPLE ID	EMAX SAMPLE ID	RESULTS (ug/L)	DIL'N FACTOR	MOIST (%)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1W	HGC014WB	ND	1	NA	0.50	0.050	0.10	03/23/1610:11	03/22/1616:30	M47C011011	M47C011	HGC014W	NA	NA
LCS1W	HGC014WL	2.38	1	NA	0.50	0.050	0.10	03/23/1610:13	03/22/1616:30	M47C011012	M47C011	HGC014W	NA	NA
LCD1W	HGC014WC	2.40	1	NA	0.50	0.050	0.10	03/23/1610:15	03/22/1616:30	M47C011013	M47C011	HGC014W	NA	NA
KCH067-041	C129-18	ND	1	NA	0.50	0.050	0.10	03/23/1610:46	03/22/1616:30	M47C011027	M47C011	HGC014W	03/15/1614:00	03/17/16
KCH067-042	C129-19	ND	1	NA	0.50	0.050	0.10	03/23/1610:48	03/22/1616:30	M47C011028	M47C011	HGC014W	03/15/1614:40	03/17/16

METHOD SW7471A

MERCURY BY COLD VAPOR

Client : KLEINFELDER
Project : NAWS CHINA LAKE, CTO 067
Batch No. : 16C129

Matrix : SOIL
InstrumentID : 47

CLIENT SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/kg)	DIL'N FACTOR	MOIST (%)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1S	HGC012SB	ND	1	NA	0.10	0.010	0.020	03/21/1614:21	03/21/1611:40	M47C009011	M47C009	HGC012S	NA	NA
LCS1S	HGC012SL	0.445	1	NA	0.10	0.010	0.020	03/21/1614:24	03/21/1611:40	M47C009012	M47C009	HGC012S	NA	NA
LCD1S	HGC012SC	0.434	1	NA	0.10	0.010	0.020	03/21/1614:26	03/21/1611:40	M47C009013	M47C009	HGC012S	NA	NA
KCH067-035	C129-12	ND	1	0.5	0.10	0.010	0.020	03/21/1614:30	03/21/1611:40	M47C009015	M47C009	HGC012S	03/15/1612:15	03/17/16
KCH067-035MS	C129-12M	0.444	1	0.5	0.099	0.0099	0.020	03/21/1614:35	03/21/1611:40	M47C009017	M47C009	HGC012S	03/15/1612:15	03/17/16
KCH067-035MSD	C129-12S	0.439	1	0.5	0.098	0.0098	0.020	03/21/1614:37	03/21/1611:40	M47C009018	M47C009	HGC012S	03/15/1612:15	03/17/16
KCH067-032	C129-09	ND	1	1.7	0.10	0.010	0.020	03/21/1614:40	03/21/1611:40	M47C009019	M47C009	HGC012S	03/15/1611:20	03/17/16
KCH067-033	C129-10	ND	1	1.5	0.10	0.010	0.020	03/21/1614:42	03/21/1611:40	M47C009020	M47C009	HGC012S	03/15/1611:35	03/17/16
KCH067-034	C129-11	ND	1	0.4	0.10	0.010	0.020	03/21/1614:48	03/21/1611:40	M47C009023	M47C009	HGC012S	03/15/1612:10	03/17/16
KCH067-036	C129-13	ND	1	2.3	0.10	0.010	0.020	03/21/1614:50	03/21/1611:40	M47C009024	M47C009	HGC012S	03/15/1612:30	03/17/16
KCH067-037	C129-14	ND	1	1.6	0.10	0.010	0.020	03/21/1614:52	03/21/1611:40	M47C009025	M47C009	HGC012S	03/15/1612:40	03/17/16
KCH067-038	C129-15	0.0256J	1	1.3	0.10	0.010	0.020	03/21/1614:55	03/21/1611:40	M47C009026	M47C009	HGC012S	03/15/1612:50	03/17/16
KCH067-039	C129-16	ND	1	1.1	0.10	0.010	0.020	03/21/1614:58	03/21/1611:40	M47C009027	M47C009	HGC012S	03/15/1613:00	03/17/16
KCH067-040	C129-17	ND	1	1.0	0.10	0.010	0.020	03/21/1615:00	03/21/1611:40	M47C009028	M47C009	HGC012S	03/15/1613:05	03/17/16

Ka 5/17/16

LDC #: 36282C4a

SDG #: 16C129

Laboratory: EMAX Laboratories Inc.

VALIDATION COMPLETENESS WORKSHEET

Standard/Full

Date: 5/10/16

Page: 1 of 1

Reviewer: JD

2nd Reviewer: JL

METHOD: Metals (EPA SW 846 Method 6020A/7470A)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	3/15/16
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB= (10) SB=(11)
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MSD = (12,13)(14,15)
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCSD
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	A	Not reviewed for Standard validation
XIII.	Sample Result Verification 30	SW/A	Not reviewed for Standard validation.
XIV.	Overall Assessment of Data ↓	SW/A	

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

** Indicates sample underwent Full validation

	Client ID		Lab ID	Matrix	Date
1	KCH067-032**		16C129-09**	Soil	03/15/16
2	KCH067-033		16C129-10	Soil	03/15/16
3	KCH067-034		16C129-11	Soil	03/15/16
4	KCH067-035		16C129-12	Soil	03/15/16
5	KCH067-036		16C129-13	Soil	03/15/16
6	KCH067-037		16C129-14	Soil	03/15/16
7	KCH067-038		16C129-15	Soil	03/15/16
8	KCH067-039		16C129-16	Soil	03/15/16
9	KCH067-040		16C129-17	Soil	03/15/16
10	KCH067-041		16C129-18	Water	03/15/16
11	KCH067-042		16C129-19	Water	03/15/16
12	KCH067-035MS	All	16C129-12MS	Soil	03/15/16
13	KCH067-035MSD	↓	16C129-12MSD	Soil	03/15/16
14	KCH067-041MS	All but Hg	16C129-18MS	Water	03/15/16
15	KCH067-041MSD	↓	16C129-18MSD	Water	03/15/16

LDC #: 36282C4a

VALIDATION COMPLETENESS WORKSHEET

Standard/Full

Date: 5/10/16

SDG #: 16C129

Page: 2 of 2

Laboratory: EMAX Laboratories Inc.

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: Metals (EPA SW 846 Method 6020A/7470A)

	Client ID	Lab ID	Matrix	Date
16	#1DL			
17	#6DL			
18				
19				
20				

Notes:

LDC #: 36282C4a

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
2nd Reviewer: AC

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

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			

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

LDC #: 36282C4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

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

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-9	S	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
10-11	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
QC:12-13	S	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
QC:14-15	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
16-17	S	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, ~~Hg~~ JD, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___

Comments: Mercury by CVAA if performed

ELEMENTS.wpd

LDC #: 36282C4a

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: JD
2nd Reviewer:

METHOD: Metals (EPA SW 864 Method 6010/6020/7000) Soil preparation factor applied:

Sample Concentration units, unless otherwise noted: ug/L Associated Samples: All Waters (07)

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	11									
Cu		0.308			0.811/~~1.00~~									

Sample Concentration units, unless otherwise noted: mg/kg Associated Samples: 1-4 (07)

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	2	3	4							
Mo			0.203		0.324/~~0.490~~	0.195/~~0.485~~	0.310/~~0.490~~							

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.

LDC #: 36282C4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: JD
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA Method 200.7/200.8)
Blank units: ug/L **Associated sample units:** mg/kg
Sampling date: 03/15/16 Soil factor applied 50X
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: All Soils (06)

Analyte	Blank ID	Sample Identification										
	10	Action Limit	2	3	4	5	6	7	8	9	17	
Al	21.6											
Ba	1.09	0.545										
B	4.36		8.19/~~9.81~~	5.65/~~9.70~~	5.36/~~9.81~~	6.06/~~10.0~~	6.18/~~9.73~~	5.40/~~9.98~~	5.75/~~9.82~~	5.70/~~9.81~~		
Ca	122	61										
Cr	0.284											
Cu	1.34	0.67										
Fe	27.5											
Pb	0.570											
Mg	17.7											
Mn	0.800											
Ni	0.156											
K	156	78										
Na	152	76		94.9/~~97.0~~	71.3/~~98.1~~	77.3/~~100~~	81.9/~~97.3~~	77.5/~~99.8~~	85.8/~~96.2~~	85.7/~~98.1~~	70.6/~~467~~	
Zn	8.14										97.4U	

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

LDC #: 36282C4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: JD
2nd Reviewer: AC

METHOD: Trace Metals (EPA Method 200.7/200.8)
Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 03/15/16 Soil factor applied _____
Field blank type: (circle one) Field Blank / Rinsate / Other: (SB) Associated Samples: 10 (06)

Analyte	Blank ID	Sample Identification											
[redacted]	11	Action Limit	10										
Ba	0.277												
B	4.00		4.36/~~10.0~~ 5.00										
Ca	34.7												
Cr	0.101		0.284/~~1.00~~										
Cu	0.811												
Pb	0.0528		0.570/~~1.00~~										
Mg	7.51		17.7/~~100~~										
Na	35.3												

LDC #: 36282C4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JD
2nd Reviewer: AC

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

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

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

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

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

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	12/13	S	Al	135 (78-124)	132 (78-124)		4	J+det/A (det) (08)
			Ca	132 (86-118)	132 (86-118)			J+det/A (det) (08)
			Mn	120 (85-116)				J+det/A (det) (08)
			V		73 (82-116)			J-/UJ/A (det) (08)

Comments: 12/13: Ba, Fe > 4X

LDC #: 36282C4a

VALIDATION FINDINGS WORKSHEET
Sample Result Verification

Reviewer: JD
2nd Reviewer: Q

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

#	Sample ID	Analyte	Result (units)	RL (units)	Finding	Qualifications
	1	B			> Linear range	J/A (20)
	106	Fe			> Liner range	J/A (20)

Comments:

LDC #: 36282C4a

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: SD
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA CLP SOW ILM02.1)

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

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable? All except = 6020 only -- Do not include Hg

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		1	B (exceeds calibration range)	1	R/A (22)
		~~10~~ 6	Fe (exceeds calibration range)	10	R/A (22)
		16	All Except B (dilution not necessary)	16	R/A (22)
		17	All Except Fe (dilution not necessary)	17	R/A (22)

Comments:

LDC #: 36852C4a

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: JO
2nd Reviewer: [illegible]

METHOD: Trace Metals (See cover)

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

%R = Found x 100 / True

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

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV 12:43	ICP/MS (Initial calibration)	Ca	29890 ug/L	30000 ug/L	100%R	100%R	Y
ICV 14:13	CVAA (Initial calibration)	Hg	1.95 ug/L	2 ug/L	98%R	98%R	Y
	ICP (Continuing calibration)						
CCV (2) 14:07	ICP/MS (Continuing calibration)	Cr	245.3 ug/L	250 ug/L	98%R	98%R	Y
CCV 14:44	CVAA (Contining calibration)	Hg	2.11 ug/L	2 ug/L	106%R	106%R	Y
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments: _____

LDC #: 36202C4a

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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

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

$\%R = \frac{Found}{True} \times 100$ Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

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

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

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

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICS AB 13:05	ICP interference check	Cd	21.81 ug/L	20 ug/L	109%R	109%R	Y
LCS 14:24	Laboratory control sample	Hg	445.2 mg/kg	0.416 mg/kg	107%R	107%R	↓
N	Matrix spike		(SSR-SR)				
N	Duplicate						
N	ICP serial dilution						

Comments: _____

LDC #: 36828C4a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 2
Reviewer: JO
2nd reviewer: AC

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

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

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

Detected analyte results for (1) Ag were recalculated and verified using the following equation:

Concentration = (RD)(FV)(Dil) / (In. Vol.)

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

Prep Factor: 10
%Solids = 0.983
RD = 0.3658 ug/L
FV = 100 ml
In. W = 2.06g

Recalculation: $\frac{(0.3658 ug/L)(100ml)(10)}{(2.06g)(0.983)} \times \frac{1mg}{1000ug} = 0.181 mg/kg$

#	Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
	1	Al	5650	5640	y*
	|	Sb	0.890	0.889	y*
	|	As	6.11	6.11	y
	|	Ba	35.2	35.2	|
	↓	Be	0.203	0.203	↓
	16	B	25.4	25.5	y*
	1	Cd	0.779	0.779	y
	|	Ca	18200	18200	↓
	|	Cr	8.04	8.03	y*
	|	Co	3.16	3.16	y
	|	Cu	8.87	8.87	|
	|	Fe	10200	10200	|
	|	Pb	23.9	23.9	|
	|	Mg	4140	4140	|
	|	Mn	157	157	|
	|	Mo	0.802	0.802	|
	|	Ni	4.17	4.17	|
	|	K	2490	2490	|
	|	Se	0.0630	0.0630	|
	↓	Ag	0.181	0.181	↓

Note: _____

LDC #: 30282C4a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 2 of 2
Reviewer: JSD
2nd reviewer: AC

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

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

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

Detected analyte results for See Pg 1 were recalculated and verified using the following equation:

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

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

#	Sample ID	Analyte	Reported Concentration (mg/Kg)	Calculated Concentration (mg/Kg)	Acceptable (Y/N)
	1	Na	454	454	Y
	↓	Tl	0.0666	0.0666	↓
		V	20.7	20.7	
	↓	Zn	385	385	↓
	~~4b~~ 3D				

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 12, 2016

Parameters: Hexavalent Chromium

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C129

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-032**	16C129-09**	Soil	03/15/16
KCH067-033	16C129-10	Soil	03/15/16
KCH067-041	16C129-18	Water	03/15/16
KCH067-042	16C129-19	Water	03/15/16
KCH067-032MS	16C129-09MS	Soil	03/15/16
KCH067-032MSD	16C129-09MSD	Soil	03/15/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7199

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-041 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 was identified as a source blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

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

VII. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Hexavalent Chromium - Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Hexavalent Chromium - Laboratory Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Hexavalent Chromium - Field Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

METHOD SW7199
HEXAVALENT CHROMIUM

Client : KLEINFELDER
Project : NAWS CHINA LAKE, CTO 067
Batch No. : 16C129

Matrix : SOIL
InstrumentID : 59

CLIENT SAMPLE ID	EMAX SAMPLE ID	RESULTS (ug/kg)	DIL'N. FACTOR	MOIST (%)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1S	HCC003SB	ND	1	NA	100	13	40	03/28/1613:24	03/24/1615:20	IC26003	IC26001	HCC003S	NA	NA
LCS1S	CSC003SL	1080	1	NA	100	13	40	03/28/1613:45	03/24/1615:20	IC26005	IC26001	HCC003S	NA	NA
KCH067-032	C129-09	632	1	1.7	102	13.2	40.7	03/28/1614:26	03/24/1615:20	IC26009	IC26001	HCC003S	03/15/1611:20	03/17/16
KCH067-032MS	C129-09M	2490	1	1.7	102	13.2	40.7	03/28/1615:08	03/24/1615:20	IC26013	IC26011	HCC003S	03/15/1611:20	03/17/16
KCH067-032MSD	C129-09S	2350	1	1.7	102	13.2	40.7	03/28/1615:29	03/24/1615:20	IC26015	IC26011	HCC003S	03/15/1611:20	03/17/16
KCH067-033	C129-10	70.1J	1	1.5	102	13.2	40.6	03/28/1616:31	03/24/1615:20	IC26021	IC26011	HCC003S	03/15/1611:35	03/17/16

03/17/16

METHOD SW7199
HEXAVALENT CHROMIUM

Client : KLEINFELDER
Project : NAWS CHINA LAKE, CTO 067
Batch No. : 16C129

Matrix : WATER
InstrumentID : 59

CLIENT SAMPLE ID	EMAX SAMPLE ID	RESULTS (ug/L)	DIL'N. FACTOR	MOIST (%)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1W	HCC007WB	ND	1	NA	0.2	0.05	0.1	03/17/1612:23	03/17/1612:45	IC17003	IC17001	HCC007W	NA	NA
LCS1W	HCC007WL	1.86	1	NA	0.2	0.05	0.1	03/17/1612:44	03/17/1612:45	IC17005	IC17001	HCC007W	NA	NA
LCD1W	HCC007WC	1.86	1	NA	0.2	0.05	0.1	03/17/1613:05	03/17/1612:45	IC17007	IC17001	HCC007W	NA	NA
KCH067-042	C129-19	ND	1	NA	0.2	0.05	0.1	03/17/1614:49	03/17/1612:45	IC17017	IC17011	HCC007W	03/15/1614:40	03/17/16
KCH067-041	C129-18I	ND	10	NA	2	0.5	1	03/17/1615:49	03/17/1612:45	IC17021	IC17019	HCC007W	03/15/1614:00	03/17/16

051716

LDC #: 36282C6 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16
SDG #: 16C129 Standard/Full Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: SD
2nd Reviewer: N

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7199)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	3/15/16
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	EB=(3) SB=(4)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(5,6)
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Sample result verification	A	Not reviewed for Standard validation.
XI	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-032**	16C129-09**	Soil	03/15/16
2	KCH067-033	16C129-10	Soil	03/15/16
3	KCH067-041	16C129-18	Water	03/15/16
4	KCH067-042	16C129-19	Water	03/15/16
5	KCH067-032MS	16C129-09MS	Soil	03/15/16
6	KCH067-032MSD	16C129-09MSD	Soil	03/15/16
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes:

LDC #: 36282C60

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: M

Method: Inorganics (EPA Method See Cover)

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

LDC #: 36282C9

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
2nd Reviewer: MC

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

LDC #: 36282C50

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: JD
2nd Reviewer: AK

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 1/20/16

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

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

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ug/l)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0	0	*0.9998*	0.9998	Y
		s2	0.2	0.0000157			
		s3	0.5	0.0000504			
		s4	1	0.0001022			
		s5	2	0.000194			
		s6	5	0.0005014			
		s7	7.5	0.0007527			
		s8	10	0.0010231			
ICV 13:57 Calibration verification		Found 3.925ug/L	True 4ug/L		93%R	93%R	
CCV 14:47 Calibration verification		1.949ug/L	2ug/L		97%R	97%R	
Calibration verification							

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

LDC #: 36282C6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: SD
2nd Reviewer: JL

METHOD: Inorganics, Method See Cover

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

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

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

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 13:45	Laboratory control sample	Cr^{+6}	1077 ug/kg	1000 ug/kg	108%R	108%R	Y
MS 15:08	Matrix spike sample		(SSR-SR) 1861 ug/kg	2000 ug/kg	93%R	93%R	
MSD 15:29	Duplicate sample		2346 ug/kg	2493 ug/kg	6%RPD	6%RPD	

Comments: _____

LDC #: 36282C6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: SD
2nd reviewer: KC

METHOD: Inorganics, Method See Cover

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

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

Compound (analyte) results for (1) Cr^{+6} reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{A-(-0.0000035)}{0.0001018}$

Recalculation: $\frac{0.0001229-(-0.0000035)}{0.0001018} \times \frac{(100ml)(62.5)}{(12.503g)(0.983)} = 63$ ug

A = 0.0001229
FV = 100ml
%solids = 0.983
Sm. W = 12.503g
Prep F = 62.5

#	Sample ID	Analyte	Reported Concentration (ug/kg)	Calculated Concentration (ug/kg)	Acceptable (Y/N)
	1	Cr^{+6}	632	632	Y

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 11, 2016

Parameters: Total Petroleum Hydrocarbons as Gasoline

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C129

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-042	16C129-19	Water	03/15/16
KCH067-043	16C129-20	Water	03/15/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Gasoline by Environmental Protection Agency (EPA) SW 846 Method 8015B

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An 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.

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

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-043 was identified as a trip blank. No contaminants were found.

Sample KCH067-042 was identified as a source blank. No contaminants were found.

VI. Surrogates

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

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Level III validation.

XI. Target Compound Identifications

Raw data were not reviewed for Level III validation.

XII. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Total Petroleum Hydrocarbons as Gasoline - Field Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

METHOD SW5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/21/16 14:45
Sample ID:	KCH067-042	Date Analyzed:	03/21/16 14:45
Lab Samp ID:	C129-19	Dilution Factor:	1
Lab File ID:	EC21008A	Matrix :	WATER
Ext Btch ID:	VG39C10	% Moisture :	NA
Calib. Ref.:	EC21003A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
GASOLINE	ND	0.10	0.010	0.020

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	0.0338	0.04000	84.5	69-133

Parameter	H-C Range
Gasoline	C6-C10

SGJ 7/16

METHOD SW5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/21/16 15:24
Sample ID:	KCH067-043	Date Analyzed:	03/21/16 15:24
Lab Samp ID:	C129-20	Dilution Factor:	1
Lab File ID:	EC21009A	Matrix :	WATER
Ext Btch ID:	VG39C10	% Moisture :	NA
Calib. Ref.:	EC21003A	Instrument ID :	GCT039

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
GASOLINE	ND	0.10	0.010	0.020

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	0.0308	0.04000	77.0	69-133

Parameter	H-C Range
Gasoline	C6-C10

SL 3/31/16

LDC #: 36282C7 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16

SDG #: 16C129 Standard Page: 1 of 1

Laboratory: EMAX Laboratories Inc. Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC TPH as Gasoline (EPA SW 846 Method 8015B)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	
III.	Continuing calibration	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	SB = 1 TB = 2
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	QC samples
VIII.	Laboratory control samples	A	LCS/LD
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII	Overall assessment of data	A	

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

	Client ID	Lab ID	Matrix	Date
1	KCH067-042	16C129-19	Water	03/15/16
2	KCH067-043	16C129-20	Water	03/15/16
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

	MBLK1W						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 13, 2016

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C129

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-032**	16C129-09**	Soil	03/15/16
KCH067-033	16C129-10	Soil	03/15/16
KCH067-041	16C129-18	Water	03/15/16
KCH067-042	16C129-19	Water	03/15/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

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

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

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

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

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

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

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

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

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

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

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

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

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An 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.

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

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

IV. Laboratory Blanks

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

V. Field Blanks

Sample KCH067-041 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 was identified as a source blank. No contaminants were found.

VI. Surrogates

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

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Target Compound Identifications

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

XII. Overall Assessment of Data

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

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/21/16 11:25
Sample ID	: KCH067-032	Date Analyzed:	03/21/16 15:36
Lab Samp ID	: C129-09	Dilution Factor:	1
Lab File ID	: LC21014A	Matrix	: SOIL
Ext Btch ID	: DSC017S	% Moisture	: 1.7
Calib. Ref.	: LC21009A	Instrument ID	: D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	10	2.5	5.1
JP-5	ND	20	2.5	5.1
MOTOR OIL	6.5J	20	2.5	5.1

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	99.8	101.7	98.1	60-130
HEXACOSANE	30.4	25.43	119	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/25/16

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/21/16 11:25
Sample ID:	KCH067-033	Date Analyzed:	03/21/16 15:52
Lab Samp ID:	C129-10	Dilution Factor:	1
Lab File ID:	LC21015A	Matrix :	SOIL
Ext Btch ID:	DSC017S	% Moisture :	1.5
Calib. Ref.:	LC21009A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	10	2.5	5.1
JP-5	ND	20	2.5	5.1
MOTOR OIL	ND	20	2.5	5.1

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	100	101.5	98.8	60-130
HEXACOSANE	29.7	25.38	117	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/25/16

METHOD SW3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/17/16 13:45
Sample ID:	KCH067-041	Date Analyzed:	03/18/16 16:16
Lab Samp ID:	C129-18	Dilution Factor:	1
Lab File ID:	LC18020A	Matrix :	WATER
Ext Btch ID:	DSC015W	% Moisture :	NA
Calib. Ref.:	LC18016A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
DIESEL	ND	0.50	0.050	0.10
JP-5	ND	0.50	0.050	0.10
MOTOR OIL	ND	0.50	0.050	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	0.965	1.000	96.5	60-130
HEXACOSANE	0.249	0.2500	99.4	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/25/16

METHOD SW3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/17/16 13:45
Sample ID:	KCH067-042	Date Analyzed:	03/18/16 16:33
Lab Samp ID:	C129-19	Dilution Factor:	1
Lab File ID:	LC18021A	Matrix :	WATER
Ext Btch ID:	DSC015W	% Moisture :	NA
Calib. Ref.:	LC18016A	Instrument ID :	D5

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
DIESEL	ND	0.50	0.050	0.10
JP-5	ND	0.50	0.050	0.10
MOTOR OIL	ND	0.50	0.050	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	0.972	1.000	97.2	60-130
HEXACOSANE	0.247	0.2500	98.7	60-130

Parameter	H-C Range
Diesel	C10-C24
JP-5	C8-C18

3/25/16

LDC #: 36282C8 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16
SDG #: 16C129 Standard/Full Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: EJ
2nd Reviewer: A

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015B)

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

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%RSD / ICV ≤20
III.	Continuing calibration	A	CCV ≤20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB = 3 SB = 4
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Standard validation.
XI.	Target compound identification	A	Not reviewed for Standard validation.
XII.	Overall assessment of data	A	

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

	Client ID		Lab ID	Matrix	Date
1	KCH067-032**		16C129-09**	Soil	03/15/16
2	KCH067-033		16C129-10	Soil	03/15/16
3	KCH067-041	EB	16C129-18	Water	03/15/16
4	KCH067-042	SB	16C129-19	Water	03/15/16
5					
6					
7					
8					
9					
10					
11					
12					
13					

Notes:

1	MBLK1S						
	MBLK1W						

LDC #: 36282 CS

VALIDATION FINDINGS CHECKLIST

Reviewer: FZ
2nd Reviewer: AC

Method: ✓ GC _____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?			✓	
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) < 20% or percent recoveries (%R) 80-120%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.			✓	
Was a MS/MSD analyzed every 20 samples of each matrix?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	

LDC #: 36282C8

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: EJ
2nd Reviewer: AV

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?		✓		
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 36282 c8

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: A

METHOD: GC ✓ HPLC ____

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (500std)	Recalculated CF (500std)	Reported CF (initial)	Recalculated CF (intial)	Reported %RSD	Recalculated %RSD
1	ICAL	3/9/16	Diesel C10-C24	33825	33825	31896.9	31896.9	12.9	12.9
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282c5

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: AR

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	CCV 1250	3/21/16	Diesel C10 - C24	500.0	442.28	442.28	12	12
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282cg

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer: AK

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Bromobenzene	/	100	98.07	98.1	98.1	0
Hexacosane	/	25	29.873	~~119~~ 119	119	U

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 36282C8

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer: AC

METHOD: ✓ GC ___HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: DSC0175L/SC

Compound	Spike Added (mg/kg)		Spike Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)	500	500	495	511	99	99	102	102	3	3
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282cf

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: ___ GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. #1 Compound Name Malor 6:1

Concentration = $\frac{126429 \quad (10)}{19873.41117 \quad (10.03)(0.983)}$ =

= 6.5 mg/kg

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 11, 2016

Parameters: Explosives

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C129

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-032**	16C129-09**	Soil	03/15/16
KCH067-033	16C129-10	Soil	03/15/16
KCH067-034	16C129-11	Soil	03/15/16
KCH067-035	16C129-12	Soil	03/15/16
KCH067-036	16C129-13	Soil	03/15/16
KCH067-037	16C129-14	Soil	03/15/16
KCH067-038	16C129-15	Soil	03/15/16
KCH067-039	16C129-16	Soil	03/15/16
KCH067-040	16C129-17	Soil	03/15/16
KCH067-041	16C129-18	Water	03/15/16
KCH067-042	16C129-19	Water	03/15/16
KCH067-035MS	16C129-12MS	Soil	03/15/16
KCH067-035MSD	16C129-12MSD	Soil	03/15/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Explosives by Environmental Protection Agency (EPA) SW 846 Method 8330A

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detect): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An 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.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 15.0% for all compounds.

Retention time windows were established as required by the method for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 15.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample KCH067-041 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 was identified as a source blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples 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) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation.

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
KCH067-034	HMX	46	J (all detects)	A

Raw data were not reviewed for Level III validation.

XI. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to RPD between two columns, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

China Lake CTO 067
Explosives - Data Qualification Summary - SDG 16C129

Sample	Compound	Flag	A or P	Reason (Code)
KCH067-034	HMX	J (all detects)	A	Compound quantitation (RPD between two columns) (12)

China Lake CTO 067
Explosives - Laboratory Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Explosives - Field Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/22/16 15:17
Sample ID	: KCH067-032	Date Analyzed:	03/23/16 18:50
Lab Samp ID	: C129-09	Dilution Factor:	1
Lab File ID	: XC23012A	Matrix :	SOIL
Ext Btch ID	: EXC008S	% Moisture :	NA
Calib. Ref.	: XC23002A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2110	2000	106	60-140

Note: All positive results are confirmed by Biphenyl column

3/25/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/22/16 15:17
Sample ID:	KCH067-033	Date Analyzed:	03/23/16 19:34
Lab Samp ID:	C129-10	Dilution Factor:	1
Lab File ID:	XC23013A	Matrix :	SOIL
Ext Btch ID:	EXC008S	% Moisture :	NA
Calib. Ref.:	XC23002A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2040	2000	102	60-140

Note: All positive results are confirmed by Biphenyl column

3/25/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/22/16 15:17
Sample ID:	KCH067-034	Date Analyzed:	03/23/16 22:14
Lab Samp ID:	C129-11	Dilution Factor:	1
Lab File ID:	XC23017A	Matrix :	SOIL
Ext Btch ID:	EXC008S	% Moisture :	NA
Calib. Ref.:	XC23015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	54J J(12)	400	50	100
RDX	120J	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2090	2000	104	60-140

Note: All positive results are confirmed by Biphenyl column

Dos1716

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/22/16 15:17
Sample ID	: KCH067-035	Date Analyzed:	03/23/16 22:50
Lab Samp ID	: C129-12	Dilution Factor:	1
Lab File ID	: XC23018A	Matrix :	SOIL
Ext Btch ID	: EXC008S	% Moisture :	NA
Calib. Ref.	: XC23015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	140J	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2060	2000	103	60-140

Note: All positive results are confirmed by Biphenyl column

3/25/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/22/16 15:17
Sample ID	: KCH067-036	Date Analyzed:	03/24/16 00:54
Lab Samp ID	: C129-13	Dilution Factor:	1
Lab File ID	: XC23021A	Matrix :	SOIL
Ext Btch ID	: EXC008S	% Moisture :	NA
Calib. Ref.	: XC23015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2080	2000	104	60-140

Note: All positive results are confirmed by Biphenyl column

3/25/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/22/16 15:17
Sample ID:	KCH067-037	Date Analyzed:	03/24/16 01:30
Lab Samp ID:	C129-14	Dilution Factor:	1
Lab File ID:	XC23022A	Matrix :	SOIL
Ext Btch ID:	EXC008S	% Moisture :	NA
Calib. Ref.:	XC23015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2110	2000	106	60-140

Note: All positive results are confirmed by Biphenyl column

3/25/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/22/16 15:17
Sample ID:	KCH067-038	Date Analyzed:	03/24/16 02:14
Lab Samp ID:	C129-15	Dilution Factor:	1
Lab File ID:	XC23023A	Matrix :	SOIL
Ext Btch ID:	EXC008S	% Moisture :	NA
Calib. Ref.:	XC23015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2080	2000	104	60-140

Note: All positive results are confirmed by Biphenyl column

SL 05/17/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/22/16 15:17
Sample ID:	KCH067-039	Date Analyzed:	03/24/16 02:50
Lab Samp ID:	C129-16	Dilution Factor:	1
Lab File ID:	XC23024A	Matrix :	SOIL
Ext Btch ID:	EXC008S	% Moisture :	NA
Calib. Ref.:	XC23015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2010	2000	100	60-140

Note: All positive results are confirmed by Biphenyl column

4/25/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/22/16 15:17
Sample ID:	KCH067-040	Date Analyzed:	03/24/16 03:33
Lab Samp ID:	C129-17	Dilution Factor:	1
Lab File ID:	XC23025A	Matrix :	SOIL
Ext Btch ID:	EXC008S	% Moisture :	NA
Calib. Ref.:	XC23015A	Instrument ID :	T-081

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
HMX	ND	400	50	100
RDX	ND	400	50	100
1,3,5-TNB	ND	400	50	100
1,3-DNB	ND	400	50	100
TETRYL	ND	400	57	100
NITROBENZENE	ND	400	50	100
2,4,6-TNT	ND	400	50	100
4-AM-2,6-DNT	ND	400	50	100
2-AM-4,6-DNT	ND	400	50	100
2,6-DNT	ND	400	56	100
2,4-DNT	ND	400	55	100
2-NITROTOLUENE	ND	400	76	200
3-NITROTOLUENE	ND	400	95	200
4-NITROTOLUENE	ND	400	99	200

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	2070	2000	103	60-140

Note: All positive results are confirmed by Biphenyl column

8/25/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/21/16 16:05
Sample ID:	KCH067-041	Date Analyzed:	03/23/16 15:35
Lab Samp ID:	C129-18	Dilution Factor:	1
Lab File ID:	XC23007A	Matrix	: WATER
Ext Btch ID:	EXC009W	% Moisture	: NA
Calib. Ref.:	XC23002A	Instrument ID	: T-081

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
HMX	ND	1.0	0.10	0.20
RDX	ND	1.0	0.16	0.40
1,3,5-TNB	ND	1.0	0.10	0.20
1,3-DNB	ND	1.0	0.10	0.20
TETRYL	ND	1.0	0.10	0.20
NITROBENZENE	ND	1.0	0.10	0.20
2,4,6-TNT	ND	1.0	0.16	0.40
4-AM-2,6-DNT	ND	1.0	0.20	0.20
2-AM-4,6-DNT	ND	1.0	0.10	0.20
2,6-DNT	ND	1.0	0.10	0.20
2,4-DNT	ND	1.0	0.12	0.20
2-NITROTOLUENE	ND	1.0	0.11	0.20
3-NITROTOLUENE	ND	1.0	0.16	0.40
4-NITROTOLUENE	ND	1.0	0.10	0.20

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	4.15	4.000	104	60-140

Note: All positive results are confirmed by Biphenyl column

3/25/16

METHOD SW8330A
EXPLOSIVES

Client	: KLEINFELDER	Date Collected:	03/15/16
Project	: NAWS CHINA LAKE, CTO 067	Date Received:	03/17/16
Batch No.	: 16C129	Date Extracted:	03/21/16 16:05
Sample ID	: KCH067-042	Date Analyzed:	03/23/16 16:11
Lab Samp ID	: C129-19	Dilution Factor:	1
Lab File ID	: XC23008A	Matrix	: WATER
Ext Btch ID	: EXC009W	% Moisture	: NA
Calib. Ref.	: XC23002A	Instrument ID	: T-081

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
HMX	ND	1.0	0.10	0.20
RDX	ND	1.0	0.16	0.40
1,3,5-TNB	ND	1.0	0.10	0.20
1,3-DNB	ND	1.0	0.10	0.20
TETRYL	ND	1.0	0.10	0.20
NITROBENZENE	ND	1.0	0.10	0.20
2,4,6-TNT	ND	1.0	0.16	0.40
4-AM-2,6-DNT	ND	1.0	0.20	0.20
2-AM-4,6-DNT	ND	1.0	0.10	0.20
2,6-DNT	ND	1.0	0.10	0.20
2,4-DNT	ND	1.0	0.12	0.20
2-NITROTOLUENE	ND	1.0	0.11	0.20
3-NITROTOLUENE	ND	1.0	0.16	0.40
4-NITROTOLUENE	ND	1.0	0.10	0.20

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
3,4-DINITROTOLUENE	3.96	4.000	99.1	60-140

Note: All positive results are confirmed by Biphenyl column

3/31/16

LDC #: 36282C40 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16
SDG #: 16C129 Standard/Full Page: 1 of 1
Laboratory: EMAX Laboratories Inc. Reviewer: EJ
2nd Reviewer: [illegible]

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.	Sample receipt/Technical holding times	A/A	
II.	Initial calibration/ICV	A/A	%D RSD ≤20 ICV ≤15
III.	Continuing calibration	A	CCV ≤15
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB=10 SB=11
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	SW	Not reviewed for Standard validation.
XI.	Target compound identification	A	Not reviewed for Standard validation.
XII.	System performance	A	Not reviewed for Standard validation.
XIII.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Full validation

	Client ID	Lab ID	Matrix	Date
1	KCH067-032**	16C129-09**	Soil	03/15/16
2	KCH067-033	16C129-10	Soil	03/15/16
3	KCH067-034	16C129-11	Soil	03/15/16
4	KCH067-035	16C129-12	Soil	03/15/16
5	KCH067-036	16C129-13	Soil	03/15/16
6	KCH067-037	16C129-14	Soil	03/15/16
7	KCH067-038	16C129-15	Soil	03/15/16
8	KCH067-039	16C129-16	Soil	03/15/16
9	KCH067-040	16C129-17	Soil	03/15/16
10	KCH067-041	16C129-18	Water	03/15/16
11	KCH067-042	16C129-19	Water	03/15/16
12	KCH067-035MS	16C129-12MS	Soil	03/15/16
13	KCH067-035MSD	16C129-12MSD	Soil	03/15/16
14				
15	MBLK1S			
16	MBLK1W			

LDC #: 36282c40

VALIDATION FINDINGS CHECKLIST

Reviewer: R
2nd Reviewer: M

Method: ____ GC ✓ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?		✓		
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) < 15%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) < 15%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 36282C40

VALIDATION FINDINGS CHECKLIST

Reviewer: FD
2nd Reviewer: MC

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: ____GC ____HPLC

8310	8330	8151	8141	8141 (Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L.. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel		
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion		
O. Phenanthrene	O.		O. Chlorpyrifos		
P. Pyrene	P.		P. Fenthion		
Q.	Q		Q. Parathion-ethyl		
R.			R. Trichlornate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:_____

LDC #: 36282C40

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: ~~GC~~ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

Code = 12

#	Associated Samples	Compound Name	%RPD Bet 2 columns ≤ 40 Findings	Qualifications
	3	A	46	J det / A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 36282C40

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC ~~(HPLC)~~ HPLC

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (100 std)	Recalculated CF (100 std)	Reported CF (initial)	Recalculated CF (intial)	Reported %RSD	Recalculated %RSD
1	ICAL	1/27/16	HMX (C18)	145	145.15	151.7	151.7	6.9	6.9
			2,4,6 TNT	430	429.84	410.8	410.8	6.3	6.3
2	ICAL	1/20/16	HMX (Biphenyl)	124	123.6	122.9	122.9	9.8	9.8
			2,4,6 TNT	321	320.7	322.0	322.0	6.1	6.1
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282C40

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC ~~X~~ (HPLC)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	CCV 12:55	3/23/16	HMX (C18)	400.0	~~425.88~~ ~~151.7~~ F7	425.38	6	6
			2,4,6-TNT	400.0	428.11	428.11	7	7
2	CCV 13:15	3/28/16	(Biphenyl)	200.0	219.63	219.63	10	10
			↓	200.0	191.47	191.47	4	4
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282C40

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer: [illegible]

METHOD: ___ GC ___ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
3,4- DinitroToluene	C-18 (Ch A)	200	211.2	106	106	0

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 36282C40

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration
SC = Sample concentration
SA = Spike added

MS = Matrix spike
MSD = Matrix spike duplicate

MS/MSD samples: 12 + 13

Compound	Spike Added (ug/Kg)		Sample Conc. (ug/Kg)	Spike Sample Concentration (ug/Kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)	2000	2000	ND	2070	2090	103	103	104	104	1	1
2,4,6-Trinitrotoluene (8330)	↓	↓	↓	1920	1970	96	96	99	99	3	3
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282c40

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT

2nd Reviewer: AC

METHOD: ~~GC~~ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: EXC0085L/SC

Compound	Spike Added (ug/kg)		Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)	2000	2000	2250	2210	112	112	111	111	2	2
2,4,6-Trinitrotoluene (8330)	2000	2000	2020	1930	101	101	96	96	5	5
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282CY0

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: __ GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. EXC009SL (LCS) Compound Name HMX

Concentration = (34100)(20) / (151.7)(2) =

= 2248 ug/kg

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 12, 2016

Parameters: Perchlorate

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 16C129

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-032**	16C129-09**	Soil	03/15/16
KCH067-033	16C129-10	Soil	03/15/16
KCH067-034	16C129-11	Soil	03/15/16
KCH067-035	16C129-12	Soil	03/15/16
KCH067-036	16C129-13	Soil	03/15/16
KCH067-037	16C129-14	Soil	03/15/16
KCH067-038	16C129-15	Soil	03/15/16
KCH067-039	16C129-16	Soil	03/15/16
KCH067-040	16C129-17	Soil	03/15/16
KCH067-041	16C129-18	Water	03/15/16
KCH067-042	16C129-19	Water	03/15/16
KCH067-035MS	16C129-12MS	Soil	03/15/16
KCH067-035MSD	16C129-12MSD	Soil	03/15/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Perchlorate by Environmental Protection Agency (EPA) SW 846 Method 6850

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detect): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance check was performed prior to initial calibration.

All perchlorate ion signal to noise ratio requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

The isotope ratios were within QC limits.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 15.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 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%.

The isotope ratios were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample KCH067-041 was identified as an equipment blank. No contaminants were found.

Sample KCH067-042 was identified as a source blank. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

China Lake CTO 067
Perchlorate - Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Perchlorate - Laboratory Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

China Lake CTO 067
Perchlorate - Field Blank Data Qualification Summary - SDG 16C129

No Sample Data Qualified in this SDG

METHOD SW6850
PERCHLORATE

Client : KLEINFELDER
Project : NAWS CHINA LAKE. CTO 067
Batch No. : 16C129

Matrix : SOIL
InstrumentID : G0

Client SAMPLE ID	EMAX SAMPLE ID	RESULT (ug/kg)	DIL'N. FACTOR	MOIST (%)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1S	PLC003SB	ND	1	NA	4	0.5	1	03/21/1616:10	03/21/1610:30	16MC21008	MC21004	16PLC003S	NA	NA
LCS1S	PLC003SL	4.36	1	NA	4	0.5	1	03/21/1616:25	03/21/1610:30	16MC21009	MC21004	16PLC003S	NA	NA
KCH067-032	C129-09	2.32J	1	1.7	4.07	0.509	1.02	03/21/1616:54	03/21/1610:30	16MC21011	MC21004	16PLC003S	03/15/1611:20	03/17/16
LCD1S	PLC003SC	4.52	1	NA	4	0.5	1	03/21/1617:11	03/21/1610:30	16MC21012	MC21004	16PLC003S	NA	NA
KCH067-033	C129-10	ND	1	1.5	4.06	0.508	1.02	03/21/1617:26	03/21/1610:30	16MC21013	MC21004	16PLC003S	03/15/1611:35	03/17/16
KCH067-034	C129-11	1.99J	1	0.4	4.02	0.502	1	03/21/1617:41	03/21/1610:30	16MC21014	MC21004	16PLC003S	03/15/1612:10	03/17/16
KCH067-035	C129-12	ND	1	0.5	4.02	0.503	1.01	03/21/1617:55	03/21/1610:30	16MC21015	MC21004	16PLC003S	03/15/1612:15	03/17/16
KCH067-035MS	C129-12M	4.86	1	0.5	4.02	0.503	1.01	03/21/1618:10	03/21/1610:30	16MC21016	MC21004	16PLC003S	03/15/1612:15	03/17/16
KCH067-035MSD	C129-12S	4.86	1	0.5	4.02	0.503	1.01	03/21/1618:39	03/21/1610:30	16MC21018	MC21004	16PLC003S	03/15/1612:15	03/17/16
KCH067-036	C129-13	ND	1	2.3	4.09	0.512	1.02	03/21/1619:37	03/21/1610:30	16MC21022	MC21020	16PLC003S	03/15/1612:30	03/17/16
KCH067-037	C129-14	ND	1	1.6	4.07	0.508	1.02	03/21/1619:52	03/21/1610:30	16MC21023	MC21020	16PLC003S	03/15/1612:40	03/17/16
KCH067-038	C129-15	ND	1	1.3	4.05	0.507	1.01	03/21/1620:07	03/21/1610:30	16MC21024	MC21020	16PLC003S	03/15/1612:50	03/17/16
KCH067-039	C129-16	ND	1	1.1	4.04	0.506	1.01	03/21/1620:21	03/21/1610:30	16MC21025	MC21020	16PLC003S	03/15/1613:00	03/17/16
KCH067-040	C129-17	ND	1	1.0	4.04	0.505	1.01	03/21/1620:36	03/21/1610:30	16MC21026	MC21020	16PLC003S	03/15/1613:05	03/17/16

METHOD SW6850
PERCHLORATE

Client : KLEINFELDER
Project : NAWS CHINA LAKE, CTO 067
Batch No. : 16C129

Matrix : WATER
InstrumentID : G0

Client SAMPLE ID	EMAX SAMPLE ID	RESULT (ug/L)	DIL'N. FACTOR	MOIST (%)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1W	PLC006WB	ND	1	NA	0.5	0.1	0.2	03/23/1611:28	NA	16MC23007	MC23004	16PLC006W	NA	NA
LCS1W	PLC006WL	0.588	1	NA	0.5	0.1	0.2	03/23/1611:45	NA	16MC23008	MC23004	16PLC006W	NA	NA
LCD1W	PLC006WC	0.550	1	NA	0.5	0.1	0.2	03/23/1611:59	NA	16MC23009	MC23004	16PLC006W	NA	NA
KCH067-041	C129-18	ND	1	NA	0.5	0.1	0.2	03/23/1613:56	NA	16MC23017	MC23004	16PLC006W	03/15/1614:00	03/17/16
KCH067-042	C129-19	ND	1	NA	0.5	0.1	0.2	03/23/1614:11	NA	16MC23018	MC23004	16PLC006W	03/15/1614:40	03/17/16

RG 5/17/16

8008

LDC #: 36282C87 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16
SDG #: 16C129 Standard/Full Page: 1 of 2
Laboratory: EMAX Laboratories Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

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.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	awb tune
III.	Initial calibration/ICV	A / A	r² ICV ≤ 15
IV.	Continuing calibration	A	CCV ≤ 15 LODV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB = 10 SB = 11
VII.	Surrogate spikes	N	not required
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Standard validation.
XIII.	Target compound identification	A	Not reviewed for Standard validation.
XIV.	System performance	A	Not reviewed for Standard validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Full validation

	Client ID	Lab ID	Matrix	Date
1	KCH067-032**	16C129-09**	Soil	03/15/16
2	KCH067-033	16C129-10	Soil	03/15/16
3	KCH067-034	16C129-11	Soil	03/15/16
4	KCH067-035	16C129-12	Soil	03/15/16
5	KCH067-036	16C129-13	Soil	03/15/16
6	KCH067-037	16C129-14	Soil	03/15/16
7	KCH067-038	16C129-15	Soil	03/15/16
8	KCH067-039	16C129-16	Soil	03/15/16
9	KCH067-040	16C129-17	Soil	03/15/16
10	KCH067-041 EB	16C129-18	Water	03/15/16
11	KCH067-042 SB	16C129-19	Water	03/15/16
12	KCH067-035MS	16C129-12MS	Soil	03/15/16
13	KCH067-035MSD	16C129-12MSD	Soil	03/15/16

LDC #: 36282C87 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16
SDG #: 16C129 Standard/Full Page: 3 of 2
Laboratory: EMAX Laboratories Inc. Reviewer: F
2nd Reviewer: pl

METHOD: LC/MS Perchlorate (EPA SW846 Method 6850)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				
17				
18				

Notes:

	MBLK1W						
	MBLK1S						

LDC #: 36282c87

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: EJ
2nd Reviewer: M

Method: Perchlorate (EPA SW 846 Method 6850)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the specified criteria?	✓			
Were the Perchlorate ions within ±0.3 m/z of mass 99,101 and 107?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit criteria of ≥ 0.990?	✓			
Was the isotope ratio of $^{35}Cl/^{37}Cl$ or m/z 99/101 within 2.3 to 3.8?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 15%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) of the mid-range continuing calibration ≤ 15%?	✓			
Were all percent differences (%D) of the low-range continuing calibration ≤ 50%?	✓			
Was the isotope ratio of $^{35}Cl/^{37}Cl$ or m/z 99/101 within 2.3 to 3.8?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 36282C87

VALIDATION FINDINGS CHECKLIST

Reviewer: FD
2nd Reviewer: N

Validation Area	Yes	No	NA	Findings/Comments
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?.	✓			
XI. Internal standards				
Were internal standard area counts within ± 50% of the associated calibration standard?	✓			
Were retention times of m/z 89 ($Cl^{18}O_3^-$) within 0.2 minutes of m/z 83 (ClO_3^-)?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within 0.98 to 1.02?	✓			
Was the isotope ratio of $^{35}Cl/^{37}Cl$ or m/z 99/101 within 2.3 to 3.8?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC#: 36282c87
SDG#: see cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FD
2nd Reviewer: AC

Method: LCMS Perchlorate (Method 6850)

Calibration Date	System	Compound	Standard	(Y) Response	(X) Concentration
3/3/2016	LCMS	Perchlorate	1	0.092049784	0.1
			2	0.181001406	0.2
			3	0.473018348	0.5
			4	0.958156512	1
			5	1.944112791	2
			6	4.823551117	5
			7	6.972141437	7.5

Regression Output		*Reported*
Constant	*0.022419*	*-0.002295*
Std Err of Y Est		
R Squared	*0.999451*	*0.999500*
Degrees of Freedom		
X Coefficient(s)	*0.937859*	*0.948471*
Std Err of Coef.		
Correlation Coefficient	*0.999725*	
Coefficient of Determination (r^2)	*0.999451*	*0.999500*

LDC #: 36282c87

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: M

METHOD: LC/MS Perchlorate (EPA Method 6850)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	MC21004	3/21/16	Perchlorate	2.0	2.083	2.083	4.15	4.15
2								
3								

Comments: Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282c87

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: FJ
2nd Reviewer:

METHOD: LC/MS perchlorate(EPA Method 6850)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSR - SR)/SA Where: SSR = Spiked sample result, SR = Sample result
SA = Spike added

RPD = I MSR - MSDR I * 2/(MSR + MSDR) MSR = Matrix spike percent recovery MSDR = Matrix spike duplicate percent recovery

MS/MSD samples: 12 + 13

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		Reported RPD	Recalculated RPD
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	----	----
Perchlorate	4.020	4.020	ND	4.86	4.86	121	121	121	121	0	0

Comments: Refer to Matrix Spike/Matrix Spike Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282c87

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: LC/MS Perchlorate (EPA Method 6850)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: lcs10 8012

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCSD		LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Perchlorate	4.0	4.0	4.36	4.52	109	109	113	113	4	4

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282c87

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer: M

METHOD: LCMS (EPA SW 846 Method 6850)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #1, Perchlorate

Conc. = $\frac{\left(\frac{14409}{135629} + 0.00229468\right)(40)}{(0.948471)(2.007)(0.983}$

=

2.32 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 13, 2016

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Level III & IV

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 78915

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-005	AZ30248	Soil	03/08/16
KCH067-006	AZ30249	Soil	03/08/16
KCH067-007	AZ30250	Soil	03/08/16
KCH067-008	AZ30251	Soil	03/08/16
KCH067-009	AZ30252	Soil	03/08/16
KCH067-010	AZ30253	Soil	03/08/16
KCH067-011	AZ30254	Soil	03/08/16
KCH067-012	AZ30255	Soil	03/08/16
KCH067-013	AZ30256	Soil	03/08/16
KCH067-014	AZ30257	Soil	03/08/16
KCH067-015	AZ30258	Soil	03/08/16
KCH067-016**	AZ30259**	Soil	03/08/16
KCH067-017	AZ30260	Soil	03/08/16
KCH067-018	AZ30261	Soil	03/08/16
KCH067-019	AZ30262	Water	03/08/16
KCH067-016MS	AZ30259MS	Soil	03/08/16
KCH067-016MSD	AZ30259MSD	Soil	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2011). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) SW 846 Method 8290A

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detect): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. 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%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point 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 labeled and unlabeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each unlabeled compounds and labeled compounds for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 20.0% for labeled and less than or equal to 30.0% for unlabeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each unlabeled compounds and labeled compounds for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Laboratory Blank ID	Extraction Date	Compound	Concentration	Associated Samples
160406-MB	04/06/16	OCDD Total HpCDD Total HpCDF Total HxCDF Total PeCDF Total TCDD Total TCDF	1.8 ng/Kg 0.50 ng/Kg 0.25 ng/Kg 0.30 ng/Kg 0.28 ng/Kg 0.088 ng/Kg 0.24 ng/Kg	KCH067-009
160321-MB	03/21/16	1,2,3,4,6,7,8-HpCDD OCDF Total HpCDD Total HxCDF	0.55 ng/Kg 0.36 ng/Kg 0.55 ng/Kg 0.054 ng/Kg	KCH067-005 KCH067-006 KCH067-007 KCH067-008 KCH067-010 KCH067-011 KCH067-012 KCH067-013 KCH067-014 KCH067-015 KCH067-016** KCH067-017 KCH067-018
160318-MB	03/18/16	2,3,4,6,7,8-HxCDF OCDD Total HpCDD Total HpCDF Total HxCDF Total PeCDF Total TCDD Total TCDF	4.2 pg/L 43 pg/L 2.1 pg/L 9.5 pg/L 20 pg/L 1.4 pg/L 1.1 pg/L 2.5 pg/L	All water samples in SDG 78915

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
KCH067-009	Total HpCDD Total TCDD	1.5 ng/Kg 0.29 ng/Kg	1.5J ng/Kg 0.29J ng/Kg
KCH067-005	1,2,3,4,6,7,8-HpCDD Total HpCDD	0.43 ng/Kg 0.56 ng/Kg	0.43U ng/Kg 0.56J ng/Kg
KCH067-006	1,2,3,4,6,7,8-HpCDD Total HpCDD Total HxCDF	0.21 ng/Kg 0.21 ng/Kg 0.21 ng/Kg	0.21U ng/Kg 0.21U ng/Kg 0.21J ng/Kg

Sample	Compound	Reported Concentration	Modified Final Concentration
KCH067-007	1,2,3,4,6,7,8-HpCDD OCDF Total HpCDD Total HxCDF	8.1 ng/Kg 7.9 ng/Kg 8.1 ng/Kg 6.2 ng/Kg	8.1J ng/Kg 7.9J ng/Kg 8.1J ng/Kg 6.2J ng/Kg
KCH067-008	1,2,3,4,6,7,8-HpCDD OCDF Total HpCDD Total HxCDF	0.33 ng/Kg 0.22 ng/Kg 0.80 ng/Kg 0.27 ng/Kg	0.33U ng/Kg 0.22U ng/Kg 0.80J ng/Kg 0.27J ng/Kg
KCH067-010	Total HpCDD	0.31 ng/Kg	0.31U ng/Kg
KCH067-011	1,2,3,4,6,7,8-HpCDD Total HpCDD	1.5 ng/Kg 1.5 ng/Kg	1.5J ng/Kg 1.5J ng/Kg
KCH067-012	1,2,3,4,6,7,8-HpCDD Total HpCDD	0.32 ng/Kg 0.32 ng/Kg	0.32U ng/Kg 0.32U ng/Kg
KCH067-014	Total HpCDD Total HxCDF	0.25 ng/Kg 0.27 ng/Kg	0.25U ng/Kg 0.27J ng/Kg
KCH067-015	1,2,3,4,6,7,8-HpCDD Total HpCDD Total HxCDF	0.29 ng/Kg 0.29 ng/Kg 2.3 ng/Kg	0.29U ng/Kg 0.29U ng/Kg 2.3J ng/Kg
KCH067-016**	Total HpCDD	0.32 ng/Kg	0.32U ng/Kg
KCH067-017	1,2,3,4,6,7,8-HpCDD Total HpCDD	5.3 ng/Kg 5.3 ng/Kg	5.3J ng/Kg 5.3J ng/Kg
KCH067-019	OCDD Total HxCDF Total PeCDF	57 pg/L 10 pg/L 7.2 pg/L	57J pg/L 10U pg/L 7.2J pg/L

VI. Field Blanks

Sample KCH067-019 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
KCH067-019	03/08/16	OCDD OCDF Total HxCDF Total PeCDF	57 pg/L 4.0 pg/L 10 pg/L 7.2 pg/L	All soil samples in SDG 78915

Sample KCH067-042 (from SDG 76998) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
KCH067-042	03/15/16	2,3,4,6,7,8-HxCDF OCDD Total HpCDF Total HxCDF Total HxCDD	2.4 pg/L 25 pg/L 2.8 pg/L 2.4 pg/L 1.9 pg/L	All water samples in SDG 78915

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
KCH067-005	Total PeCDF	12 ng/Kg	12J ng/Kg
KCH067-006	OCDD Total HxCDF	1.6 ng/Kg 0.21 ng/Kg	1.6U ng/Kg 0.21U ng/Kg
KCH067-007	OCDD OCDF Total HxCDF Total PeCDF	139 ng/Kg 7.9 ng/Kg 6.2 ng/Kg 1.0 ng/Kg	139J ng/Kg 7.9J ng/Kg 6.2U ng/Kg 1.0U ng/Kg
KCH067-008	OCDD OCDF Total HxCDF	2.3 ng/Kg 0.22 ng/Kg 0.27 ng/Kg	2.3U ng/Kg 0.22U ng/Kg 0.27U ng/Kg
KCH067-010	OCDD Total PeCDF	3.0 ng/Kg 0.15 ng/Kg	3.0U ng/Kg 0.15U ng/Kg
KCH067-012	Total PeCDF	0.45 ng/Kg	0.45U ng/Kg
KCH067-013	Total PeCDF	0.12 ng/Kg	0.12U ng/Kg
KCH067-014	OCDD Total HxCDF Total PeCDF	1.6 ng/Kg 0.27 ng/Kg 0.23 ng/Kg	1.6U ng/Kg 0.27U ng/Kg 0.23U ng/Kg
KCH067-015	OCDD Total HxCDF	2.4 ng/Kg 2.3 ng/Kg	2.4U ng/Kg 2.3U ng/Kg
KCH067-016**	OCDD Total PeCDF	0.93 ng/Kg 0.35 ng/Kg	0.93U ng/Kg 0.35U ng/Kg
KCH067-017	OCDD Total PeCDF	47 ng/Kg 0.52 ng/Kg	47U ng/Kg 0.52U ng/Kg
KCH067-018	Total PeCDF	0.36 ng/Kg	0.36U ng/Kg

Sample	Compound	Reported Concentration	Modified Final Concentration
KCH067-019	OCDD Total HxCDF	57 pg/L 10 pg/L	57J pg/L 10J pg/L

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard recoveries (%R) were within QC limits.

XI. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to laboratory blank contamination, data were qualified as not detected or estimated in thirteen samples.

Due to equipment blank and source blank contamination, data were qualified as not detected or estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

China Lake CTO 067
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 78915

No Sample Data Qualified in this SDG

China Lake CTO 067
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 78915

Sample	Compound	Modified Final Concentration	A or P	Code
KCH067-009	Total HpCDD Total TCDD	1.5J ng/Kg 0.29J ng/Kg	A	7
KCH067-005	1,2,3,4,6,7,8-HpCDD Total HpCDD	0.43U ng/Kg 0.56J ng/Kg	A	7
KCH067-006	1,2,3,4,6,7,8-HpCDD Total HpCDD Total HxCDF	0.21U ng/Kg 0.21U ng/Kg 0.21J ng/Kg	A	7
KCH067-007	1,2,3,4,6,7,8-HpCDD OCDF Total HpCDD Total HxCDF	8.1J ng/Kg 7.9J ng/Kg 8.1J ng/Kg 6.2J ng/Kg	A	7
KCH067-008	1,2,3,4,6,7,8-HpCDD OCDF Total HpCDD Total HxCDF	0.33U ng/Kg 0.22U ng/Kg 0.80J ng/Kg 0.27J ng/Kg	A	7
KCH067-010	Total HpCDD	0.31U ng/Kg	A	7
KCH067-011	1,2,3,4,6,7,8-HpCDD Total HpCDD	1.5J ng/Kg 1.5J ng/Kg	A	7
KCH067-012	1,2,3,4,6,7,8-HpCDD Total HpCDD	0.32U ng/Kg 0.32U ng/Kg	A	7
KCH067-014	Total HpCDD Total HxCDF	0.25U ng/Kg 0.27J ng/Kg	A	7
KCH067-015	1,2,3,4,6,7,8-HpCDD Total HpCDD Total HxCDF	0.29U ng/Kg 0.29U ng/Kg 2.3J ng/Kg	A	7
KCH067-016**	Total HpCDD	0.32U ng/Kg	A	7
KCH067-017	1,2,3,4,6,7,8-HpCDD Total HpCDD	5.3J ng/Kg 5.3J ng/Kg	A	7

Sample	Compound	Modified Final Concentration	A or P	Code
KCH067-019	OCDD Total HxCDF Total PeCDF	57J pg/L 10U pg/L 7.2J pg/L	A	7

China Lake CTO 067
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 78915

Sample	Compound	Modified Final Concentration	A or P	Code
KCH067-005	Total PeCDF	12J ng/Kg	A	6
KCH067-006	OCDD Total HxCDF	1.6U ng/Kg 0.21U ng/Kg	A	6
KCH067-007	OCDD OCDF Total HxCDF Total PeCDF	139J ng/Kg 7.9J ng/Kg 6.2U ng/Kg 1.0U ng/Kg	A	6
KCH067-008	OCDD OCDF Total HxCDF	2.3U ng/Kg 0.22U ng/Kg 0.27U ng/Kg	A	6
KCH067-010	OCDD Total PeCDF	3.0U ng/Kg 0.15U ng/Kg	A	6
KCH067-012	Total PeCDF	0.45U ng/Kg	A	6
KCH067-013	Total PeCDF	0.12U ng/Kg	A	6
KCH067-014	OCDD Total HxCDF Total PeCDF	1.6U ng/Kg 0.27U ng/Kg 0.23U ng/Kg	A	6
KCH067-015	OCDD Total HxCDF	2.4U ng/Kg 2.3U ng/Kg	A	6
KCH067-016**	OCDD Total PeCDF	0.93U ng/Kg 0.35U ng/Kg	A	6
KCH067-017	OCDD Total PeCDF	47U ng/Kg 0.52U ng/Kg	A	6
KCH067-018	Total PeCDF	0.36U ng/Kg	A	6
KCH067-019	OCDD Total HxCDF	57J pg/L 10J pg/L	A	6

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

Attn: Karin Kaiser

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-005

APPL ID: AZ30248

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	0.43 J U(7)	12.5	0.43PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.10 U	12.5	0.10PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.056 U	12.5	0.056DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.13 J	12.5	0.13PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.053 U	12.5	0.053DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.043 U	12.5	0.043DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.13 U	12.5	0.13PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.040 U	12.5	0.040DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.062 U	12.5	0.062DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,7,8-PECDD	0.042 U	12.5	0.042DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,7,8-PECDF	0.074 U	12.5	0.074DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.13 U	12.5	0.13PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	2,3,4,7,8-PECDF	0.078 U	12.5	0.078DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	2,3,7,8-TCDD	0.076 U	5.0	0.076DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	2,3,7,8-TCDF	0.12 U	5.0	0.12PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	OCDD	2.8 U	25.0	2.8PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	OCDF	0.16 U	25.0	0.16PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL HPCDD	0.56 J J(7)	12.5	0.56PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL HPCDF	0.44 U	12.5	0.44PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL HXCDD	0.17 J	12.5	0.42PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL HXCDF	0.54 U	12.5	0.54PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL PECDD	0.022 U	12.5	0.022DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL PECDF	0.12 J J(6)	12.5	0.64PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL TCDD	0.15 U	5.0	0.15PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL TCDF	0.19 J	5.0	0.57PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	93.1	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	86.6	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	93.4	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	96.7	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	97.3	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	85.3	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	84.2	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	81.3	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	79.8	40-135		%	03/21/16	04/04/16

J = Estimated value.

4/25/16

Quant Method: 160302_8290
Run #: 160404_HR_05
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 4:59:39 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-006

APPL ID: AZ30249

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	0.21 J U(7)	12.5	0.21PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.023 U	12.5	0.023DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.028 U	12.5	0.028DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.030 U	12.5	0.030DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.027 U	12.5	0.027DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.030 U	12.5	0.030DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.026 U	12.5	0.026DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.029 U	12.5	0.029DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.031 U	12.5	0.031DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,7,8-PECDD	0.044 U	12.5	0.044DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,7,8-PECDF	0.056 U	12.5	0.056DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.14 J	12.5	0.14PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	2,3,4,7,8-PECDF	0.059 U	12.5	0.059DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	2,3,7,8-TCDD	0.052 U	5.0	0.052DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	2,3,7,8-TCDF	0.24 J	5.0	0.24PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	OCDD	1.6 J U(6)	25.0	1.6PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	OCDF	0.15 U	25.0	0.15PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL HPCDD	0.21 J U(7)	12.5	0.25PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL HPCDF	0.084 J	12.5	0.15PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL HXCDD	0.037 U	12.5	0.037PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL HXCDF	0.21 J U(7)	12.5(6)	0.21PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL PECDD	0.044 U	12.5	0.044DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL PECDF	0.063 U	12.5	0.063PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL TCDD	0.65 U	5.0	0.65PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL TCDF	0.47 J	5.0	0.97PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	101	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	92.4	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	95.0	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	97.9	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	106	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	90.8	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	95.2	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	92.3	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	91.2	40-135		%	03/21/16	04/04/16

J = Estimated value.

5C051716

Quant Method: 160302_8290
Run #: 160404_HR_06
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 4:59:40 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-007

APPL ID: AZ30250

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	8.1 J J(7)	12.5	8.1PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.17 U	12.5	0.17DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.20 U	12.5	0.20DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.050 U	12.5	0.050DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.063 U	12.5	0.063DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.17 U	12.5	0.17PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.39 U	12.5	0.39PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.089 U	12.5	0.089PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.074 U	12.5	0.074DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,7,8-PECDD	0.027 U	12.5	0.027DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	1,2,3,7,8-PECDF	0.059 U	12.5	0.059DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	2,3,4,6,7,8-HXCDF	3.3 U	12.5	3.3PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	2,3,4,7,8-PECDF	0.062 U	12.5	0.062DL	ng/Kg	03/21/16	04/04/16
EPA 8290A	2,3,7,8-TCDD	0.15 U	5.0	0.15PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	2,3,7,8-TCDF	0.099 U	5.0	0.099PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	OCDD	139 J(6)	25.0	139PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	OCDF	7.9 J J(6,7)	25.0	7.9PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL HPCDD	8.1 J J(7)	12.5	8.4PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL HPCDF	1.6 J	12.5	5.9PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL HXCDD	0.089 J	12.5	0.37PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL HXCDF	6.2 J UJ(6)	12.5 (7)	6.8PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL PECDD	0.067 U	12.5	0.067PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL PECDF	1.0 J U(6)	12.5	1.6PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL TCDD	0.15 U	5.0	0.15PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	TOTAL TCDF	0.20 J	5.0	0.56PC	ng/Kg	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	96.3	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	79.6	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	85.9	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	99.3	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	93.1	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	86.1	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	86.2	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	84.7	40-135		%	03/21/16	04/04/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	84.7	40-135		%	03/21/16	04/04/16

J = Estimated value.

Quant Method: 160302_8290
Run #: 160404_HR_14
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 4:59:40 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

Attn: Karin Kaiser

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-008

APPL ID: AZ30251

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	0.33 J U(7)	12.5	0.33PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.029 U	12.5	0.029DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.034 U	12.5	0.034DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.052 U	12.5	0.052DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.032 U	12.5	0.032DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.053 U	12.5	0.053DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.032 U	12.5	0.032DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.050 U	12.5	0.050DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.038 U	12.5	0.038DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDD	0.038 U	12.5	0.038DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDF	0.030 U	12.5	0.030DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.069 U	12.5	0.069PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,7,8-PECDF	0.031 U	12.5	0.031DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDD	0.019 U	5.0	0.019DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDF	0.077 U	5.0	0.077PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDD	2.3 J U(6)	25.0	2.3PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDF	0.22 J U(6,7)	25.0	0.22PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDD	0.80 J J(7)	12.5	0.80PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDF	0.071 J	12.5	0.25PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDD	0.17 U	12.5	0.17PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDF	0.27 J UJ(6)	12.5 (7)	0.46PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDD	0.060 U	12.5	0.060PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDF	0.12 U	12.5	0.12PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDD	0.029 J	5.0	0.098PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDF	0.024 J	5.0	0.20PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	108	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	91.8	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	96.6	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	105	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	99.7	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	92.1	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	92.4	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	93.7	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	94.9	40-135		%	03/21/16	04/05/16

J = Estimated value.

Quant Method: 160302_8290
Run #: 160404_HR_15
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 4:59:40 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-009

APPL ID: AZ30252

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160406-2066

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	1.5 J	12.5	1.5PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.54 U	12.5	0.54PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.13 U	12.5	0.13PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.060 U	12.5	0.060DL	ng/Kg	04/06/16	04/12/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.066 U	12.5	0.066DL	ng/Kg	04/06/16	04/12/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.21 U	12.5	0.21PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.065 U	12.5	0.065DL	ng/Kg	04/06/16	04/12/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.13 U	12.5	0.13PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.13 U	12.5	0.13PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	1,2,3,7,8-PECDD	0.066 U	12.5	0.066DL	ng/Kg	04/06/16	04/12/16
EPA 8290A	1,2,3,7,8-PECDF	0.10 U	12.5	0.10DL	ng/Kg	04/06/16	04/12/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.16 U	12.5	0.16PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	2,3,4,7,8-PECDF	0.23 U	12.5	0.23PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	2,3,7,8-TCDD	0.052 U	5.0	0.052DL	ng/Kg	04/06/16	04/12/16
EPA 8290A	2,3,7,8-TCDF	0.11 U	5.0	0.11DL	ng/Kg	04/06/16	04/12/16
EPA 8290A	OCDD	9.1 U	25.0	9.1PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	OCDF	0.20 U	25.0	0.20PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	TOTAL HPCDD	1.5 J J(7)	12.5	1.6PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	TOTAL HPCDF	1.4 U	12.5	1.4PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	TOTAL HXCDD	0.23 U	12.5	0.23PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	TOTAL HXCDF	1.5 U	12.5	1.5PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	TOTAL PECDD	0.16 J	12.5	0.45PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	TOTAL PECDF	0.74 U	12.5	0.74PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	TOTAL TCDD	0.29 J J(7)	5.0	0.60PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	TOTAL TCDF	1.3 U	5.0	1.3PC	ng/Kg	04/06/16	04/12/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	77.3	40-135		%	04/06/16	04/12/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	73.3	40-135		%	04/06/16	04/12/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	76.4	40-135		%	04/06/16	04/12/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	74.3	40-135		%	04/06/16	04/12/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	69.8	40-135		%	04/06/16	04/12/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	65.4	40-135		%	04/06/16	04/12/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	66.3	40-135		%	04/06/16	04/12/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	65.9	40-135		%	04/06/16	04/12/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	68.9	40-135		%	04/06/16	04/12/16

J = Estimated value.

Quant Method: 160302_8290
Run #: 160411_HR_18
Instrument: Magneto
Sequence: 160411
Dilution Factor: 1
Initials: RP

4/05/16

Printed: 04/18/16 5:29:53 AM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-010

APPL ID: AZ30253

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	0.33 U	12.5	0.33PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.068 U	12.5	0.068PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.065 U	12.5	0.065DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.034 U	12.5	0.034PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.041 U	12.5	0.041DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.030 U	12.5	0.030DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.040 U	12.5	0.040DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.029 U	12.5	0.029DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.058 U	12.5	0.058PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDD	0.033 U	12.5	0.033DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDF	0.034 U	12.5	0.034DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.042 U	12.5	0.042DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,7,8-PECDF	0.036 U	12.5	0.036DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDD	0.029 U	5.0	0.029DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDF	0.17 U	5.0	0.17PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDD	3.0 J U(6)	25.0	3.0PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDF	0.20 U	25.0	0.20PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDD	0.31 J U(7)	12.5	0.65PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDF	0.077 J	12.5	0.38PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDD	0.12 J	12.5	0.44PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDF	0.33 U	12.5	0.33PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDD	0.035 J	12.5	0.32PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDF	0.15 J U(6)	12.5	0.82PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDD	0.30 U	5.0	0.30PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDF	0.24 J	5.0	0.41PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	67.2	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	62.1	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	66.3	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	67.7	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	61.6	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	56.7	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	56.5	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	61.8	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	56.9	40-135		%	03/21/16	04/05/16

J = Estimated value.

Quant Method: 160302_8290
Run #: 160404_HR_17
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

4/7/16

Printed: 04/08/16 4:59:40 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

Attn: Karin Kaiser

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-011

APPL ID: AZ30254

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	1.5 J J(7)	12.5	1.5PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.11 U	12.5	0.11DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.13 U	12.5	0.13DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.099 U	12.5	0.099DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.17 U	12.5	0.17PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.10 U	12.5	0.10DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.10 U	12.5	0.10DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.096 U	12.5	0.096DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.12 U	12.5	0.12DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDD	0.10 U	12.5	0.10DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDF	0.14 U	12.5	0.14DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.12 U	12.5	0.12PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,7,8-PECDF	0.11 U	12.5	0.11PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDD	0.14 U	5.0	0.14PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDF	0.23 U	5.0	0.23PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDD	13 U	25.0	13PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDF	0.45 U	25.0	0.45PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDD	1.5 J J(7)	12.5	1.5PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDF	0.75 U	12.5	0.75PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDD	0.50 U	12.5	0.50PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDF	1.2 U	12.5	1.2PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDD	0.18 U	12.5	0.18PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDF	0.78 U	12.5	0.78PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDD	0.14 U	5.0	0.14PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDF	0.44 J	5.0	2.3PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	57.4	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	58.6	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	61.8	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	60.7	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	55.9	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	53.6	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	54.6	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	51.9	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	49.9	40-135		%	03/21/16	04/05/16

J = Estimated value.

SG 051716

Quant Method: 160302_8290
Run #: 160404_HR_18
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 4:59:40 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-012

APPL ID: AZ30255

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	0.32 J U(7)	12.5	0.32PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.046 U	12.5	0.046DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.055 U	12.5	0.055DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.090 U	12.5	0.090DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.040 U	12.5	0.040DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.092 U	12.5	0.092DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.039 U	12.5	0.039DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.14 U	12.5	0.14PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.047 U	12.5	0.047DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDD	0.017 U	12.5	0.017DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDF	0.074 U	12.5	0.074DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.15 U	12.5	0.15PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,7,8-PECDF	0.078 U	12.5	0.078DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDD	0.014 U	5.0	0.014DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDF	0.10 U	5.0	0.10PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDD	2.2 U	25.0	2.2PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDF	0.041 U	25.0	0.041DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDD	0.32 J U(7)	12.5	0.44PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDF	0.50 U	12.5	0.50PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDD	0.25 J	12.5	0.56PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDF	0.53 U	12.5	0.53PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDD	0.18 U	12.5	0.18PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDF	0.45 J U(6)	12.5	0.45PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDD	0.067 J	5.0	0.23PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDF	0.22 J	5.0	1.0PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	105	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	97.8	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	98.8	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	104	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	98.1	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	91.3	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	88.3	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	89.6	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	91.2	40-135		%	03/21/16	04/05/16

J = Estimated value.

4/5/16

Quant Method: 160302_8290
Run #: 160404_HR_19
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 4:59:40 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-013

APPL ID: AZ30256

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	0.051 U	12.5	0.051DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.20 J	12.5	0.20PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.049 U	12.5	0.049DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.034 U	12.5	0.034DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.047 U	12.5	0.047DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.035 U	12.5	0.035DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.046 U	12.5	0.046DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.033 U	12.5	0.033DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.055 U	12.5	0.055DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDD	0.030 U	12.5	0.030DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDF	0.059 U	12.5	0.059DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.049 U	12.5	0.049DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,7,8-PECDF	0.062 U	12.5	0.062DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDD	0.033 U	5.0	0.033DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDF	0.17 U	5.0	0.17PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDD	0.70 U	25.0	0.70PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDF	0.045 U	25.0	0.045DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDD	0.051 U	12.5	0.051DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDF	0.20 J	12.5	0.20PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDD	0.18 U	12.5	0.18PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDF	0.20 U	12.5	0.20PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDD	0.039 U	12.5	0.039PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDF	0.12 J U(6)	12.5	0.52PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDD	0.52 U	5.0	0.52PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDF	0.60 U	5.0	0.60PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	103	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	94.5	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	101	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	106	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	98.0	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	90.6	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	89.3	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	91.4	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	84.4	40-135		%	03/21/16	04/05/16

J = Estimated value.

Quant Method: 160302_8290
Run #: 160404_HR_24
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

4/8/16

Printed: 04/08/16 4:59:40 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-014

APPL ID: AZ30257

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	0.051 U	12.5	0.051DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.037 U	12.5	0.037DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.044 U	12.5	0.044DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.048 U	12.5	0.048DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.042 U	12.5	0.042DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.049 U	12.5	0.049DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.041 U	12.5	0.041DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.046 U	12.5	0.046DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.049 U	12.5	0.049DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDD	0.037 U	12.5	0.037DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDF	0.032 U	12.5	0.032DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.13 U	12.5	0.13PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,7,8-PECDF	0.034 U	12.5	0.034DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDD	0.036 U	5.0	0.036DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDF	0.097 U	5.0	0.097PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDD	1.6 J U(6)	25.0	1.6PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDF	0.13 U	25.0	0.13PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDD	0.25 J U(7)	12.5	0.25PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDF	0.47 U	12.5	0.47PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDD	0.14 U	12.5	0.14PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDF	0.27 J U(6,7)	12.5	0.55PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDD	0.077 J	12.5	0.45PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDF	0.23 J U(6)	12.5	0.55PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDD	0.069 U	5.0	0.069PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDF	0.31 U	5.0	0.31PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	84.9	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	72.0	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	78.4	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	85.8	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	79.5	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	70.6	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	73.6	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	71.0	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	75.5	40-135		%	03/21/16	04/05/16

J = Estimated value.

4/5/16

Quant Method: 160302_8290
Run #: 160404_HR_25
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 4:59:40 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-015

APPL ID: AZ30258

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	0.29 J U(7)	12.5	0.29PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.14 U	12.5	0.14PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.065 U	12.5	0.065DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.047 U	12.5	0.047DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.092 U	12.5	0.092DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.048 U	12.5	0.048DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.25 U	12.5	0.25PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.046 U	12.5	0.046DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.11 U	12.5	0.11DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDD	0.068 U	12.5	0.068DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDF	0.044 U	12.5	0.044DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.52 U	12.5	0.52PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,7,8-PECDF	0.046 U	12.5	0.046DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDD	0.11 U	5.0	0.11DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDF	0.10 U	5.0	0.10PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDD	2.4 J U(6)	25.0	2.4PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDF	0.18 U	25.0	0.18PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDD	0.29 J U(7)	12.5	0.39PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDF	0.59 U	12.5	0.59PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDD	0.11 J	12.5	0.22PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDF	2.3 J UJ(6)	12.5 (7)	3.5PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDD	0.26 U	12.5	0.26PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDF	1.9 U	12.5	1.9PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDD	0.84 U	5.0	0.84PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDF	0.97 U	5.0	0.97PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	107	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	98.7	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	101	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	106	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	102	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	91.9	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	84.7	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	89.1	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	92.5	40-135		%	03/21/16	04/05/16

J = Estimated value.

8/25/16

Quant Method: 160302_8290
Run #: 160404_HR_26
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 4:59:40 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-016

APPL ID: AZ30259

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	0.069 U	12.5	0.069DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.052 U	12.5	0.052DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.061 U	12.5	0.061DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.038 U	12.5	0.038PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.045 U	12.5	0.045DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.048 U	12.5	0.048DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.044 U	12.5	0.044DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.046 U	12.5	0.046DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.053 U	12.5	0.053DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDD	0.056 U	12.5	0.056DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDF	0.047 U	12.5	0.047DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.11 U	12.5	0.11PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,7,8-PECDF	0.050 U	12.5	0.050DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDD	0.052 U	5.0	0.052DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDF	0.25 U	5.0	0.25PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDD	0.93 J U(6)	25.0	0.93PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDF	0.039 U	25.0	0.039PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDD	0.32 J U(7)	12.5	0.64PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDF	0.058 U	12.5	0.058PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDD	0.12 U	12.5	0.12PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDF	0.11 U	12.5	0.11PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDD	0.24 U	12.5	0.24PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDF	0.35 J U(6)	12.5	0.65PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDD	0.026 U	5.0	0.026DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDF	0.53 U	5.0	0.53PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	82.3	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	73.8	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	78.0	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	80.2	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	84.8	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	74.4	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	73.0	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	70.6	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	71.5	40-135		%	03/21/16	04/05/16

J = Estimated value.

8/25/16

Quant Method: 160302_8290
Run #: 160404_HR_27
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 4:59:40 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-017

APPL ID: AZ30260

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	5.3 J J(7)	12.5	5.3PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.40 U	12.5	0.40PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.16 U	12.5	0.16DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.17 U	12.5	0.17DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.19 U	12.5	0.19DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.17 U	12.5	0.17DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.19 U	12.5	0.19DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.16 U	12.5	0.16DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.22 U	12.5	0.22DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDD	0.19 U	12.5	0.19DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	1,2,3,7,8-PECDF	0.093 U	12.5	0.093DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.20 U	12.5	0.20DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,4,7,8-PECDF	0.098 U	12.5	0.098DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDD	0.097 U	5.0	0.097DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	2,3,7,8-TCDF	0.20 J	5.0	0.20PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDD	47 U(6)	25.0	47PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	OCDF	0.24 U	25.0	0.24DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDD	5.3 J J(7)	12.5	5.3PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HPCDF	1.8 U	12.5	1.8PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDD	1.1 U	12.5	1.1PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL HXCDF	1.0 U	12.5	1.0PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDD	0.19 U	12.5	0.19DL	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL PECDF	0.52 J U(6)	12.5	0.72PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDD	0.79 U	5.0	0.79PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	TOTAL TCDF	0.43 J	5.0	0.58PC	ng/Kg	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	99.0	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	86.9	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	108	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	103	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	88.3	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	85.6	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	85.0	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	86.6	40-135		%	03/21/16	04/05/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	106	40-135		%	03/21/16	04/05/16

J = Estimated value.

Quant Method: 160302_8290
Run #: 160404_HR_28
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

4/5/16

Printed: 04/08/16 4:59:40 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-018

APPL ID: AZ30261

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	0.57 U	12.5	0.57PC	ng/Kg	03/21/16	04/06/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.045 U	12.5	0.045DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.065 U	12.5	0.065PC	ng/Kg	03/21/16	04/06/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.042 U	12.5	0.042DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.070 U	12.5	0.070DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.043 U	12.5	0.043DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.068 U	12.5	0.068DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.041 U	12.5	0.041DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.081 U	12.5	0.081DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	1,2,3,7,8-PECDD	0.034 U	12.5	0.034DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	1,2,3,7,8-PECDF	0.034 U	12.5	0.034DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.073 U	12.5	0.073DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	2,3,4,7,8-PECDF	0.036 U	12.5	0.036DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	2,3,7,8-TCDD	0.019 U	5.0	0.019DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	2,3,7,8-TCDF	0.024 U	5.0	0.024DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	OCDD	3.9 U	25.0	3.9PC	ng/Kg	03/21/16	04/06/16
EPA 8290A	OCDF	0.077 U	25.0	0.077DL	ng/Kg	03/21/16	04/06/16
EPA 8290A	TOTAL HPCDD	0.63 U	12.5	0.63PC	ng/Kg	03/21/16	04/06/16
EPA 8290A	TOTAL HPCDF	0.055 J	12.5	0.43PC	ng/Kg	03/21/16	04/06/16
EPA 8290A	TOTAL HXCDD	0.18 U	12.5	0.18PC	ng/Kg	03/21/16	04/06/16
EPA 8290A	TOTAL HXCDF	0.23 U	12.5	0.23PC	ng/Kg	03/21/16	04/06/16
EPA 8290A	TOTAL PECDD	0.061 J	12.5	0.54PC	ng/Kg	03/21/16	04/06/16
EPA 8290A	TOTAL PECDF	0.36 J U(6)	12.5	0.40PC	ng/Kg	03/21/16	04/06/16
EPA 8290A	TOTAL TCDD	0.20 U	5.0	0.20PC	ng/Kg	03/21/16	04/06/16
EPA 8290A	TOTAL TCDF	0.31 J	5.0	0.51PC	ng/Kg	03/21/16	04/06/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	92.8	40-135		%	03/21/16	04/06/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	76.3	40-135		%	03/21/16	04/06/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	95.7	40-135		%	03/21/16	04/06/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	102	40-135		%	03/21/16	04/06/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	84.3	40-135		%	03/21/16	04/06/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	77.6	40-135		%	03/21/16	04/06/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	84.1	40-135		%	03/21/16	04/06/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	82.6	40-135		%	03/21/16	04/06/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	88.2	40-135		%	03/21/16	04/06/16

J = Estimated value.

Quant Method: 160302_8290
Run #: 160404_HR_29
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

8/05/16

Printed: 04/08/16 4:59:40 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

Attn: Karin Kaiser

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78915

Sample ID: KCH067-019

APPL ID: AZ30262

Sample Collection Date: 03/08/16

QCG: $829ACTO6-160318-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	3.5 U	125.0	3.5PC	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.61 U	125.0	0.61DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	1.3 U	125.0	1.3PC	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.93 U	125.0	0.93DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.52 U	125.0	0.52DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.94 U	125.0	0.94DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.51 U	125.0	0.51DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.90 U	125.0	0.90DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.60 U	125.0	0.60DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,7,8-PECDD	0.82 U	125.0	0.82DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,7,8-PECDF	0.60 U	125.0	0.60DL	pg/L	03/18/16	04/03/16
EPA 8290A	2,3,4,6,7,8-HXCDF	2.7 U	125.0	2.7PC	pg/L	03/18/16	04/03/16
EPA 8290A	2,3,4,7,8-PECDF	0.93 U	125.0	0.93PC	pg/L	03/18/16	04/03/16
EPA 8290A	2,3,7,8-TCDD	0.70 U	50.0	0.70DL	pg/L	03/18/16	04/03/16
EPA 8290A	2,3,7,8-TCDF	0.83 U	50.0	0.83PC	pg/L	03/18/16	04/03/16
EPA 8290A	OCDD	57 J J(6)	250.0 (7)	57PC	pg/L	03/18/16	04/03/16
EPA 8290A	OCDF	4.0 J	250.0	4.0PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL HPCDD	4.1 U	125.0	4.1PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL HPCDF	4.1 U	125.0	4.1PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL HXCDD	0.98 U	125.0	0.98PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL HXCDF	10 J UJ(6)	125.0 (7)	15PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL PECDD	1.6 U	125.0	1.6PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL PECDF	7.2 J J(6)	125.0	12PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL TCDD	0.86 U	50.0	0.86PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL TCDF	0.83 U	50.0	0.83PC	pg/L	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	78.3	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	74.6	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	78.4	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	81.9	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	72.8	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	66.2	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	69.7	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	69.5	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	65.0	40-135		%	03/18/16	04/03/16

J = Estimated value.

SLS 17/16

Quant Method: 160302_8290
Run #: 160403_HR_06
Instrument: Magneto
Sequence: 160403
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 5:12:53 PM
Form 1 - APPL Standard GC - No MC

LDC #: 36282D21
SDG #: 78915
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Standard/Full

Date: 5/12/16
Page: 1 of 2
Reviewer: P
2nd Reviewer: R

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW846 Method 8290A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	% RSD ≤ 20 ICV = 20/30 unlabeled/labeled
IV.	Continuing calibration	A	↓
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	EB = 15 SB= KCH067-042 (78998)
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Internal standards	A	
XI.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Standard validation.
XII.	Target compound identification	A	Not reviewed for Standard validation.
XIII.	System performance	A	Not reviewed for Standard validation.
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Full validation

	Client ID	Lab ID	Matrix	Date
1 2	KCH067-005	AZ30248	Soil	03/08/16
2 2	KCH067-006	AZ30249	Soil	03/08/16
3 2	KCH067-007	AZ30250	Soil	03/08/16
4 2	KCH067-008	AZ30251	Soil	03/08/16
5 3	KCH067-009	AZ30252	Soil	03/08/16
6 2	KCH067-010	AZ30253	Soil	03/08/16
7 2	KCH067-011	AZ30254	Soil	03/08/16
8 2	KCH067-012	AZ30255	Soil	03/08/16
9 2	KCH067-013	AZ30256	Soil	03/08/16
10 2	KCH067-014	AZ30257	Soil	03/08/16
11 2	KCH067-015	AZ30258	Soil	03/08/16
12 2	KCH067-016**	AZ30259**	Soil	03/08/16
13 2	KCH067-017	AZ30260	Soil	03/08/16
14 2	KCH067-018	AZ30261	Soil	03/08/16

LDC #: 36282D21
SDG #: 78915
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Standard/Full

Date: 5/12/16

Reviewer: FJ
2nd Reviewer: JK

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW846 Method 8290A)

	Client ID	Lab ID	Matrix	Date
15 1	KCH067-019	AZ30262	Water	03/08/16
16 2	KCH067-016MS	AZ30259MS	Soil	03/08/16
17 2	↓ MSD	↓ MSD	↓	↓
18				
19				
20				
21				

Notes:

1	160318-MB						
2	160321-MB						
3	160406-MB						

LDC #: 36282021

VALIDATION FINDINGS CHECKLIST

Reviewer: EJ
2nd Reviewer: AC

Method: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
IIIa. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and labeled compounds ?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound ≥ 2.5 and for each recovery and internal standard ≥ 10?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% for unlabeled compounds and ≤ 30% for labeled compounds ?	✓			
IV. Continuing calibration				
Was a contiuning calibration performed at the beginning and end of each 12 hour period?	✓			
Were all percent differences (%D) ≤ 20% for unlabeled compounds and ≤ 30% for labeled compounds ?	✓			
Did all routine calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound and for each recovery and internal standard ≥ 10?	✓			
V. Laboratory Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet?	✓			
VI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.	✓			
VII. Matrix spike/Matrix spike duplicates				

LDC #: 36282021

VALIDATION FINDINGS CHECKLIST

Reviewer: EJ
2nd Reviewer: AC

Validation Area	Yes	No	NA	Findings/Comments
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
X. Internal standards				
Were internal standard recoveries within the 40-135% criteria?	✓			
Was the minimum S/N ratio of all internal standard peaks ≥ 10?	✓			
XI. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound and labeled standard ≥ 2.5?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?				
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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:_____

_____

_____

LDC #: 36282D2 1

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: EM
2nd Reviewer: AK

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

code = 7

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 4/6/16 **Blank analysis date:** 4/12/16 **Associated samples:** 5

Conc. units: ng/kg

Compound	Blank ID	Sample Identification								
	160406-MB	5								
G	1.8	-								
U	0.50	1.5 J								
Y	0.25	-								
X	0.30	-								
W	0.28	-								
R	0.088	0.29 J								
V	0.24	-								

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".

LDC #: 36282D21

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

code = 7

Blank extraction date: 3/21/16 **Blank analysis date:** 4/4/16 **Associated samples:** 1→4, 6→14

Conc. units: ng/kg

Compound	Blank ID	Sample Identification								
	160321-MB	MB	1	2	3	4	5	6	7	8
* F	0.55		0.43 U	0.21 U	8.1 J	0.33 U	1.5 J	-	1.5 J	0.32 U
* Q	0.36				7.9 J	0.22 U	-	-	-	-
* U	0.55		0.56 J	0.21 U	~~7.9 J~~ 8.1 J	0.80 J	~~1.5 J~~	0.31 U	1.5 J	0.32 U
* X	0.054			0.21 J	6.2 J	0.27 J	-	-	-	-
* > EDL										

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".

LDC #: 36282D1

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: PD
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?

Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?

Y N N/A Was the method blank contaminated?

code = 7

Blank extraction date: 3/21/16 **Blank analysis date:** 4/4/16 **Associated samples:** 1→4, 6→14

Conc. units: ng/kg

Compound	Blank ID	Sample Identification								
	160321-MB	10	11	12	13	~~14~~ F7				
* F	0.55	-	0.29U	-	5.3J					
* Q	0.36	-	-	-	-					
* U	0.55	0.25U	0.29U	0.32U	5.3J					
* X	0.05U	0.27J	2.3J	-	-					
* 7 EDL										

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".

LDC #: 36282D21

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

code = 7

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 3/18/16 **Blank analysis date:** 4/3/16 **Associated samples:** all water

Conc. units: pg/L

Compound	Blank ID	Sample Identification								
	160318-MB	LCS								
* M	4.2	-								
* G	43	57 J								
* U	2.1	-								
* Y	9.5	-								
* X	20	104								
* W	1.4	7.2 J								
* R	1.1	-								
* V	2.5	-								
* > EDL										

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".

LDC #: 36282021

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Y N N/A Were field blanks identified in this SDG? Circle = 6

Blank units: pg/L **Associated sample units:** ng/kg
Sampling date: 3/8/16
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: All soils

Compound	Blank ID	Sample Identification								
	15	1	2	3	4	5	8	9	10	11
G	57	-	1.6U	139 J	2.3U	3.0U			1.6U	2.4U
Q	4.0	~~0.36U~~	-	7.9J	0.22U	-			-	-
X	10	-	0.21U	6.2U	0.27U	-			0.27U	2.3U
W	7.2	12 J	-	1.0U	-	0.15U	0.45U	0.12U	0.23U	-
CRQL										

Blank units: pg/L **Associated sample units:** ng/kg
Sampling date: 3/8/16
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: All soils

Compound	Blank ID	Sample Identification								
	15		12	13	14	7 (ND)				
G	57		0.93U	47U						
Q	40		-	-						
X	10		-	-						
W	7.2		0.35U	0.52U	0.36U					
CRQL										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 36282021

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: PD
2nd Reviewer: AK

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

SB = KCH067-042

Cont = 6

(Y) N N/A Were field blanks identified in this SDG?
Blank units: pg/L **Associated sample units:** pg/L
Sampling date: 3/15/16
Field blank type: (circle one) Field Blank / Rinsate / Other: SB Associated Samples: all water (#15)

Compound	Blank ID	Sample Identification								
	SB		15							
M	2.4									
G	25		57 J							
Y	2.8									
X	2.4		10 J							
T	1.9									
CRQL										

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								
CRQL										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 36282D21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 8290)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported RRF (CS-3 std)	Recalculated RRF (CS-3 std)	Reported %RSD	Recalculated %RSD
1	IGAL	3/2/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.951858	0.951858	0.91456	0.91456	3.29222	3.29222
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.07768	1.07768	1.09162	1.09162	5.022	5.022
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	1.05456	1.05456	1.02152	1.02152	2.30779	2.30779
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.990196	0.990196	0.96245	0.96245	3.63217	3.63217
			OCDF (^{13}C-OCDD)	1.21618	1.21618	1.18811	1.18811	5.75034	5.75034
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282D 21

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Reviewer: FD
2nd Reviewer: X

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	160404_HR_02 ccv	4/4/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.951858	0.826	0.826	13.2	13.2
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.07768	1.025	1.025	4.9	4.9
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	1.05456	0.990	0.990	6.1	6.1
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.990196	0.975	0.975	1.5	1.5
			OCDF (^{13}C-OCDD)	1.21618	1.175	1.175	3.4	3.4
2	160404_HR_41 ccv	4/6/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)		0.825	0.825	13.4	13.4
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)		1.028	1.028	4.7	4.7
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)		1.053	1.053	0.2	0.2
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)		0.976	0.976	1.4	1.4
			OCDF (^{13}C-OCDD)	↓	1.190	1.190	2.2	2.2
3	160404 HR_21 ccv	4/5/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)		0.791	0.791	17.0	17.0
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)		0.969	0.969	10.1	10.1
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)		1.014	1.014	3.9	3.9
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	↓	0.950	0.950	4.0	4.0
			OCDF (^{13}C-OCDD)	↓	1.148	1.148	5.6	5.6

Comments: Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282D21

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FR
2nd Reviewer: AC

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSR - SR)/SA Where: SSR = Spiked sample result, SR = Sample result
SA = Spike added

RPD = I MSR - MSDR I * 2/(MSR + MSDR) MSR = Matrix spike percent recovery MSDR = Matrix spike duplicate percent recovery

MS/MSD samples: 16 + 17

Compound	Spike Added (ng/kg)		Sample Concentration (ng/kg)	Spiked Sample Concentration (ng/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	33.4	33.3 4	ND	32.3	34.7	96.7	96.7	104	104	7.2	7.2
1,2,3,7,8-PeCDD	83.6	83.6		81.6	85.4	97.6	97.6	102	102	4.6	4.6
1,2,3,4,7,8-HxCDD	83.6	83.6		72.8	73.6	87.1	87.1	88.0	88.0	1.1	1.1
1,2,3,4,7,8,9-HpCDF	83.6	83.6		66.2	67.8	79.2	79.2	81.1	81.1	2.4	2.4
OCDF	167	167		127	134	76	76	80.2	80.2	5.4	5.4

Comments: Refer to Matrix Spike/Matrix Spike Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282D21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: EJ
2nd Reviewer: AC

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: 160321-LCS

Compound	Spike Added (ng/kg)		Spiked Sample Concentration (ng/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	49.8	NA	43.8	NA	88.0	88.0				
1,2,3,7,8-PeCDD	124		109		87.9	87.9				
1,2,3,4,7,8-HxCDD	124		99.6		80.3	80.3				
1,2,3,4,7,8,9-HpCDF	124		89.5		72.2	72.2				
OCDF	249	↓	187	↓	75.1	75.1	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282D2J

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: EJ
2nd reviewer: A

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. #12, OCDD:

Conc. = $\frac{(2.996940 \times 10^2 + 3.040940 \times 10^2)(200)(0.05)(1000)}{(1.912105 \times 10^5 + 2.155929 \times 10^5)(1.07099)(15.33)(0.972)}$

0.93 ng/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 13, 2016

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Level III & IV

Laboratory: APPL, Inc.

Sample Delivery Group (SDG): 78998

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-032**	AZ30748**	Soil	03/15/16
KCH067-033	AZ30749	Soil	03/15/16
KCH067-041	AZ30750	Water	03/15/16
KCH067-042	AZ30751	Water	03/15/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2011). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) SW 846 Method 8290A

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detect): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. 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%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point 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 labeled and unlabeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each unlabeled compounds and labeled compounds for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 20.0% for labeled and less than or equal to 30.0% for unlabeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each unlabeled compounds and labeled compounds for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Laboratory Blank ID	Extraction Date	Compound	Concentration	Associated Samples
160321-MB	03/21/16	1,2,3,4,6,7,8-HpCDD OCDF Total HpCDD Total HxCDF	0.55 ng/Kg 0.36 ng/Kg 0.55 ng/Kg 0.054 ng/Kg	All soil samples in SDG 78998
160318-MB	03/18/16	2,3,4,6,7,8-HxCDF OCDD Total HpCDD Total HpCDF Total HxCDF Total PeCDF Total TCDD Total TCDF	4.2 pg/L 43 pg/L 2.1 pg/L 9.5 pg/L 20 pg/L 1.4 pg/L 1.1 pg/L 2.5 pg/L	All water samples in SDG 78998

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
KCH067-032**	1,2,3,4,6,7,8-HpCDD OCDF Total HpCDD Total HxCDF	51 ng/Kg 4.5 ng/Kg 51 ng/Kg 6.7 ng/Kg	51J ng/Kg 4.5J ng/Kg 51J ng/Kg 6.7J ng/Kg
KCH067-033	1,2,3,4,6,7,8-HpCDD Total HpCDD Total HxCDF	3.3 ng/Kg 3.3 ng/Kg 0.43 ng/Kg	3.3J ng/Kg 3.3J ng/Kg 0.43J ng/Kg
KCH067-041	Total TCDD Total TCDF	0.87 pg/L 12 pg/L	0.87U pg/L 12U pg/L
KCH067-042	2,3,4,6,7,8-HxCDF OCDD Total HpCDF Total HxCDF	2.4 pg/L 25 pg/L 2.8 pg/L 2.4 pg/L	2.4U pg/L 25U pg/L 2.8U pg/L 2.4U pg/L

VI. Field Blanks

Sample KCH067-041 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
KCH067-041	03/15/16	Total TCDD Total TCDF	0.87 pg/L 12 pg/L	All soil samples in SDG 78998

Sample KCH067-042 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
KCH067-042	03/15/16	2,3,4,6,7,8-HxCDF OCDD Total HpCDF Total HxCDF Total HxCDD	2.4 ng/L 25 ng/L 2.8 ng/L 2.4 ng/L 1.9 ng/L	KCH067-041

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
KCH067-032**	Total TCDD Total TCDF	0.095 ng/Kg 2.5 ng/Kg	0.095U ng/Kg 2.5U ng/Kg
KCH067-033	Total TCDF	0.51 ng/Kg	0.51U ng/Kg

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard recoveries (%R) were within QC limits.

XI. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to laboratory blank contamination, data were qualified as not detected or estimated in four samples.

Due to equipment blank contamination, data were qualified as not detected in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

China Lake CTO 067
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 78998

No Sample Data Qualified in this SDG

China Lake CTO 067
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 78998

Sample	Compound	Modified Final Concentration	A or P	Code
KCH067-032**	1,2,3,4,6,7,8-HpCDD OCDF Total HpCDD Total HxCDF	51J ng/Kg 4.5J ng/Kg 51J ng/Kg 6.7J ng/Kg	A	7
KCH067-033	1,2,3,4,6,7,8-HpCDD Total HpCDD Total HxCDF	3.3J ng/Kg 3.3J ng/Kg 0.43J ng/Kg	A	7
KCH067-041	Total TCDD Total TCDF	0.87U pg/L 12U pg/L	A	7
KCH067-042	2,3,4,6,7,8-HxCDF OCDD Total HpCDF Total HxCDF	2.4U pg/L 25U pg/L 2.8U pg/L 2.4U pg/L	A	7

China Lake CTO 067
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 78998

Sample	Compound	Modified Final Concentration	A or P	Code
KCH067-032**	Total TCDD Total TCDF	0.095U ng/Kg 2.5U ng/Kg	A	6
KCH067-033	Total TCDF	0.51U ng/Kg	A	6

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78998

Sample ID: KCH067-032

APPL ID: AZ30748

Sample Collection Date: 03/15/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result		PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	51	J(7)	12.5	51PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	1.5 U		12.5	1.5PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.27 U		12.5	0.27DL	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.29 J		12.5	0.29PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.24 J		12.5	0.24PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,6,7,8-HXCDD	1.6 J		12.5	1.6PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.15 U		12.5	0.15PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.72 U		12.5	0.72PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.70 U		12.5	0.70PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,7,8-PECDD	0.14 U		12.5	0.14DL	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,7,8-PECDF	0.28 U		12.5	0.28PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	2,3,4,6,7,8-HXCDF	3.5 U		12.5	3.5PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	2,3,4,7,8-PECDF	0.34 U		12.5	0.34PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	2,3,7,8-TCDD	0.20 U		5.0	0.20PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	2,3,7,8-TCDF	0.70 U		5.0	0.70PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	OCDD	437		25.0	437PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	OCDF	4.5 J	J(7)	25.0	4.5PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL HPCDD	51	↓	12.5	53PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL HPCDF	3.6 U		12.5	3.6PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL HXCDD	12 J		12.5	13PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL HXCDF	6.7 J	J(7)	12.5	8.9PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL PECDD	0.38 J		12.5	2.6PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL PECDF	1.7 U		12.5	1.7PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL TCDD	0.095 J	U(6)	5.0	0.73PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL TCDF	2.5 J	↓	5.0	5.1PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	90.0		40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	76.9		40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	79.9		40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	88.3		40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	83.4		40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	73.9		40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	72.5		40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	73.2		40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	71.5		40-135		%	03/21/16	04/07/16

J = Estimated value.

4/05/16

Quant Method: 160302_8290
Run #: 160404_HR_45
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 5:21:04 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78998

Sample ID: KCH067-033

APPL ID: AZ30749

Sample Collection Date: 03/15/16

QCG: $829ACTO6-160321-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	3.3 J J(7)	12.5	3.3PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	3.0 J	12.5	3.0PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.079 U	12.5	0.079DL	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.20 U	12.5	0.20PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.14 U	12.5	0.14PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.065 U	12.5	0.065DL	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.11 U	12.5	0.11PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.062 U	12.5	0.062DL	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.068 U	12.5	0.068DL	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,7,8-PECDD	0.061 U	12.5	0.061DL	ng/Kg	03/21/16	04/07/16
EPA 8290A	1,2,3,7,8-PECDF	0.14 U	12.5	0.14DL	ng/Kg	03/21/16	04/07/16
EPA 8290A	2,3,4,6,7,8-HXCDF	0.43 U	12.5	0.43PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	2,3,4,7,8-PECDF	0.14 U	12.5	0.14DL	ng/Kg	03/21/16	04/07/16
EPA 8290A	2,3,7,8-TCDD	0.038 U	5.0	0.038DL	ng/Kg	03/21/16	04/07/16
EPA 8290A	2,3,7,8-TCDF	0.11 U	5.0	0.11PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	OCDD	27	25.0	27PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	OCDF	1.6 U	25.0	1.6PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL HPCDD	3.3 J J(7)	12.5	3.7PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL HPCDF	3.0 J	12.5	3.0PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL HXCDD	0.60 U	12.5	0.60PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL HXCDF	0.43 J J(7)	12.5	2.1PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL PECDD	0.42 U	12.5	0.42PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL PECDF	0.39 J	12.5	0.73PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL TCDD	0.65 U	5.0	0.65PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	TOTAL TCDF	0.51 J U(6)	5.0	1.2PC	ng/Kg	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	87.2	40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	78.0	40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	88.7	40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	95.0	40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	90.1	40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	81.5	40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	86.6	40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	86.3	40-135		%	03/21/16	04/07/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	68.4	40-135		%	03/21/16	04/07/16

J = Estimated value.

4/25/16

Quant Method: 160302_8290
Run #: 160404_HR_46
Instrument: Magneto
Sequence: 160404
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 5:21:05 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

Attn: Karin Kaiser

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78998

Sample ID: KCH067-041

APPL ID: AZ30750

Sample Collection Date: 03/15/16

QCG: $829ACTO6-160318-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	5.2 U	125.0	5.2PC	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	0.52 U	125.0	0.52DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.61 U	125.0	0.61DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.71 U	125.0	0.71DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.78 U	125.0	0.78DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.73 U	125.0	0.73DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.76 U	125.0	0.76DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.69 U	125.0	0.69DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.91 U	125.0	0.91DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,7,8-PECDD	0.80 U	125.0	0.80DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,7,8-PECDF	1.2 U	125.0	1.2DL	pg/L	03/18/16	04/03/16
EPA 8290A	2,3,4,6,7,8-HXCDF	1.9 U	125.0	1.9PC	pg/L	03/18/16	04/03/16
EPA 8290A	2,3,4,7,8-PECDF	1.3 U	125.0	1.3DL	pg/L	03/18/16	04/03/16
EPA 8290A	2,3,7,8-TCDD	0.94 U	50.0	0.94PC	pg/L	03/18/16	04/03/16
EPA 8290A	2,3,7,8-TCDF	0.61 U	50.0	0.61DL	pg/L	03/18/16	04/03/16
EPA 8290A	OCDD	24 U	250.0	24PC	pg/L	03/18/16	04/03/16
EPA 8290A	OCDF	3.4 U	250.0	3.4PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL HPCDD	14 U	125.0	14PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL HPCDF	3.8 U	125.0	3.8PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL HXCDD	1.6 U	125.0	1.6PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL HXCDF	4.9 U	125.0	4.9PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL PECDD	2.0 U	125.0	2.0PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL PECDF	9.0 U	125.0	9.0PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL TCDD	0.87 J U(7)	50.0	7.1PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL TCDF	12 J ↓	50.0	18PC	pg/L	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	79.7	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	77.3	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	77.8	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	84.0	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	74.4	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	69.0	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	71.7	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	71.3	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	66.9	40-135		%	03/18/16	04/03/16

J = Estimated value.

8/5/16

Quant Method: 160302_8290
Run #: 160403_HR_07
Instrument: Magneto
Sequence: 160403
Dilution Factor: 1
Initials: RP

Printed: 04/08/16 5:21:39 PM
Form 1 - APPL Standard GC - No MC

EPA 8290A

Kleinfelder
1039 Hyland Drive
Evergreen, CO 80439

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

Attn: Karin Kaiser

Project: 479811.67.07.09.AC CTO067 China Lake

ARF: 78998

Sample ID: KCH067-042

APPL ID: AZ30751

Sample Collection Date: 03/15/16

QCG: $829ACTO6-160318-2062

Method	Analyte	Result	PQL	EDL/EMPC	Units	Ext Date	Analysis Date
EPA 8290A	1,2,3,4,6,7,8-HPCDD	1.2 U	125.0	1.2DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,4,6,7,8-HPCDF	1.1 U	125.0	1.1PC	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,4,7,8,9-HPCDF	0.53 U	125.0	0.53DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,4,7,8-HXCDD	0.60 U	125.0	0.60DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,4,7,8-HXCDF	0.59 U	125.0	0.59DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,6,7,8-HXCDD	0.61 U	125.0	0.61DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,6,7,8-HXCDF	0.58 U	125.0	0.58DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,7,8,9-HXCDD	0.58 U	125.0	0.58DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,7,8,9-HXCDF	0.69 U	125.0	0.69DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,7,8-PECDD	0.75 U	125.0	0.75DL	pg/L	03/18/16	04/03/16
EPA 8290A	1,2,3,7,8-PECDF	0.72 U	125.0	0.72DL	pg/L	03/18/16	04/03/16
EPA 8290A	2,3,4,6,7,8-HXCDF	2.4 J U(7)	125.0	2.4PC	pg/L	03/18/16	04/03/16
EPA 8290A	2,3,4,7,8-PECDF	0.76 U	125.0	0.76DL	pg/L	03/18/16	04/03/16
EPA 8290A	2,3,7,8-TCDD	0.70 U	50.0	0.70DL	pg/L	03/18/16	04/03/16
EPA 8290A	2,3,7,8-TCDF	0.50 U	50.0	0.50DL	pg/L	03/18/16	04/03/16
EPA 8290A	OCDD	25 J U(7)	250.0	25PC	pg/L	03/18/16	04/03/16
EPA 8290A	OCDF	2.4 U	250.0	2.4PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL HPCDD	0.87 U	125.0	0.87PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL HPCDF	2.8 J U(7)	125.0	7.7PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL HXCDD	1.9 J	125.0	1.9PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL HXCDF	2.4 J U(7)	125.0	3.7PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL PECDD	1.5 U	125.0	1.5PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL PECDF	9.2 U	125.0	9.2PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL TCDD	3.9 U	50.0	3.9PC	pg/L	03/18/16	04/03/16
EPA 8290A	TOTAL TCDF	4.8 U	50.0	4.8PC	pg/L	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDD (S	75.0	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,6,7,8-HPCDF (S	70.7	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,4,7,8-HXCDF (S)	72.0	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,6,7,8-HXCDD (S)	78.6	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDD (S)	67.2	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-1,2,3,7,8-PECDF (S)	61.7	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDD (S)	65.0	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-2,3,7,8-TCDF (S)	65.2	40-135		%	03/18/16	04/03/16
EPA 8290A	SURROGATE: 13C-OCDD (S)	62.2	40-135		%	03/18/16	04/03/16

J = Estimated value.

4/5/16

Quant Method: 160302_8290
Run #: 160403_HR_08
Instrument: Magneto
Sequence: 160403
Dilution Factor: 1
Initials: RP

Printed: 04/09/16 10:07:05 AM
Form 1 - APPL Standard GC - No MC

LDC #: 36282E21
SDG #: 78998
Laboratory: APPL, Inc.

VALIDATION COMPLETENESS WORKSHEET
Standard/Full

Date: 5/11/16
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: AL

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW846 Method 8290A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A /A	%D RSD ≤ 20 ICV ≤ 20/30 unlabeled labeled
IV.	Continuing calibration	A	CCV ≤ 20/30
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	EB = 3 SB = 4
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Internal standards	A	
XI.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Standard validation.
XII.	Target compound identification	A	Not reviewed for Standard validation.
XIII.	System performance	A	Not reviewed for Standard validation.
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Full validation

	Client ID	Lab ID	Matrix	Date
1 2	KCH067-032**	AZ30748**	Soil	03/15/16
2 N	KCH067-033	AZ30749	Soil	03/15/16
3 1	KCH067-041	AZ30750	Water	03/15/16
4 1	KCH067-042	AZ30751	Water	03/15/16
5				
6				
7				
8				
9				
10				
11				

Notes:

+1	160318-MB						
+2	160321 - MB						

LDC #: 36282 E21

VALIDATION FINDINGS CHECKLIST

Reviewer: F2
2nd Reviewer: AC

Method: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
IIIa. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and labeled compounds ?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound ≥ 2.5 and for each recovery and internal standard ≥ 10?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% for unlabeled compounds and ≤ 30% for labeled compounds ?	✓			
IV. Continuing calibration				
Was a contiuning calibration performed at the beginning and end of each 12 hour period?	✓			
Were all percent differences (%D) ≤ 20% for unlabeled compounds and ≤ 30% for labeled compounds ?	✓			
Did all routine calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound and for each recovery and internal standard ≥ 10?	✓			
V. Laboratory Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet?	✓			
VI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.	✓			
VII. Matrix spike/Matrix spike duplicates				

LDC #: 36282E21

VALIDATION FINDINGS CHECKLIST

Reviewer: EJ
2nd Reviewer: AV

Validation Area	Yes	No	NA	Findings/Comments
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
X. Internal standards				
Were internal standard recoveries within the 40-135% criteria?	✓			
Was the minimum S/N ratio of all internal standard peaks ≥ 10?	✓			
XI. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound and labeled standard ≥ 2.5?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?	✓			
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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:_____

LDC #: 36282E21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: EM
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Code = 7

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 3/21/16 **Blank analysis date:** 4/4/16 **Associated samples:** all soils

Conc. units: ng/kg

Compound	Blank ID	Sample Identification								
	160321-MB	1		2						
F	0.55	51J		3.3J						
Q	0.36	4.5J								
U	0.55	51J		3.3J						
X	0.054	6.7J		0.43J						

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".

LDC #: 36282E21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: B
2nd Reviewer: M

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

code = 7

Blank extraction date: 3/18/16 **Blank analysis date:** 4/3/16 **Associated samples:** all water

Conc. units: pg/L

Compound	Blank ID	Sample Identification								
	160318-	MB	3	4						
M	4.2			2.4 U						
G	43			25 U						
U	2.1									
Y	9.5			2.8 U						
X	20			2.4 U						
W	1.4									
R	1.1		0.87 U							
V	2.5		12 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".

LDC #: 36282E21

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

(Y) N N/A Were field blanks identified in this SDG?
Blank units: pg/L **Associated sample units:** ng/kg
Sampling date: 3/15/16
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: All SOILS

wdle = 6

Compound	Blank ID	Sample Identification									
	3		1		2						
R	0.87		0.095 U								
Y	12		2.5 U		0.51 U						
CRQL											

Blank units: ng/L **Associated sample units:** ng/L
Sampling date: 3/15/16
Field blank type: (circle one) Field Blank / Rinsate / Other: SB Associated Samples: 3 (ND)

Compound	Blank ID	Sample Identification									
	4										
M	2.4										
G	25										
Y	2.8										
X	2.4										
T	1.9										
CRQL											

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 36282E21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JG
2nd Reviewer: R

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 8290)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported RRF (CS-3 std)	Recalculated RRF (CS-3 std)	Reported %RSD	Recalculated %RSD
1	IGAL	3/2/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.951858	0.951858	0.91456	0.91456	3.29222	3.29222
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.07768	1.07768	1.09162	1.09162	5.022	5.022
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	1.05456	1.05456	1.02152	1.02152	2.30779	2.30779
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.990196	0.990196	0.96245	0.96245	3.63217	3.63217
			OCDF (^{13}C-OCDD)	1.21618	1.21618	1.18811	1.18811	5.75034	5.75034
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282E21

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	160404_HR_02 ccv	4/4/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.951858	0.826	0.826	13.2	13.2
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.07768	1.025	1.025	4.9	4.9
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	1.05456	0.990	0.990	6.1	6.1
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.990196	0.975	0.975	1.5	1.5
			OCDF (^{13}C-OCDD)	1.21618	1.175	1.175	3.4	3.4
2	160404_HR_41 ccv	4/6/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)		0.825	0.825	13.4	13.4
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)		1.028	1.028	4.7	4.7
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)		1.053	1.053	0.2	0.2
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)		0.976	0.976	1.4	1.4
			OCDF (^{13}C-OCDD)		1.190	1.190	2.2	2.2
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					

Comments: Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282E21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: EJ
2nd Reviewer: AK

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: 160321 - LCS1D

Compound	Spike Added (ng/kg)		Spiked Sample Concentration (ng/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	49.8	NA	43.8	NA	88.0	88.0				
1,2,3,7,8-PeCDD	124		105		84.7	84.7				
1,2,3,4,7,8-HxCDD	124		99.6		80.3	80.3				
1,2,3,4,7,8,9-HpCDF	124		89.5		72.2	72.2				
OCDF	249		187		75.1	75.1	NA			

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282E21

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: EJ
2nd reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. #1, OCDD:

Conc. = $\frac{(1.325662 \times 10^5 + 1.494042 \times 10^5)(200)(0.05)(1000)}{(2.193651 \times 10^5 + 2.436840 \times 10^5)(1.07099)(13.00)}$

= 437 ng/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 13, 2016

Parameters: Perfluorinated Alkyl Acids

Validation Level: Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): K1602494

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-009	K1602494-001	Soil	03/08/16
KCH067-010	K1602494-002	Soil	03/08/16
KCH067-011	K1602494-003	Soil	03/08/16
KCH067-012	K1602494-004	Soil	03/08/16
KCH067-013	K1602494-005	Soil	03/08/16
KCH067-014	K1602494-006	Soil	03/08/16
KCH067-015	K1602494-007	Soil	03/08/16
KCH067-016**	K1602494-008**	Soil	03/08/16
KCH067-019	K1602494-009	Water	03/08/16
KCH067-016MS	K1602494-008MS	Soil	03/08/16
KCH067-016MSD	K1602494-008MSD	Soil	03/08/16

**Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Perfluorinated Alkyl Acids by Environmental Protection Agency (EPA) Method 537

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detect): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance was checked as applicable.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 25.0%.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 25.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 25.0%.

The percent differences (%D) of the ending CCVs were less than or equal to 25.0%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
KQ1602477-03	03/17/16	Perfluorooctanoic acid	0.48 ng/L	All water samples in SDG K1602494

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
KCH067-019	Perfluorooctanoic acid	0.47 ng/L	0.80U ng/L

VI. Field Blanks

Sample KCH067-019 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
KCH067-019	03/08/16	Perfluorooctanoic acid	0.47 ng/L	All soil samples in SDG K1602494

Sample KCH067-042 (from SDG K1602709) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
KCH067-042	03/15/16	Perfluorooctanoic acid	0.39 ng/L	KCH067-019

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
KCH067-019	Perfluorooctanoic acid	0.47 ng/g	0.80U ng/g
KCH067-009	Perfluorooctanoic acid	0.35 ng/g	0.35U ng/g
KCH067-011	Perfluorooctanoic acid	0.29 ng/g	0.29U ng/g
KCH067-012	Perfluorooctanoic acid	0.27 ng/g	0.27U ng/g
KCH067-014	Perfluorooctanoic acid	0.21 ng/g	0.21U ng/g
KCH067-015	Perfluorooctanoic acid	0.27 ng/g	0.27U ng/g
KCH067-016**	Perfluorooctanoic acid	0.24 ng/g	0.24U ng/g

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
KCH067-009	Perfluoro-n-[1,2,3,4-13C4] octanoic acid	65 (70-130)	Perfluorinated alkyl acids	J (all detects) UJ (all non-detects)	P
KCH067-011	Perfluoro-n-[1,2,3,4-13C4] octanoic acid	65 (70-130)	Perfluorinated alkyl acids	J (all detects) UJ (all non-detects)	P

Additionally, surrogate recoveries (%R) were not within QC limits for sample KCH067-013. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to surrogate %R, data were qualified as estimated in two samples.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

Due to equipment blank and source blank contamination, data were qualified as not detected in seven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

China Lake CTO 067
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG K1602494

Sample	Compound	Flag	A or P	Reason (Code)
KCH067-009 KCH067-011	Perfluorinated alkyl acids	J (all detects) UJ (all non-detects)	P	Surrogate spikes (%R) (13)

China Lake CTO 067
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG K1602494

Sample	Compound	Modified Final Concentration	A or P	Code
KCH067-019	Perfluorooctanoic acid	0.80U ng/L	A	7

China Lake CTO 067
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG K1602494

Sample	Compound	Modified Final Concentration	A or P	Code
KCH067-019	Perfluorooctanoic acid	0.80U ng/g	A	6
KCH067-009	Perfluorooctanoic acid	0.35U ng/g	A	6
KCH067-011	Perfluorooctanoic acid	0.29U ng/g	A	6
KCH067-012	Perfluorooctanoic acid	0.27U ng/g	A	6
KCH067-014	Perfluorooctanoic acid	0.21U ng/g	A	6
KCH067-015	Perfluorooctanoic acid	0.27U ng/g	A	6
KCH067-016**	Perfluorooctanoic acid	0.24U ng/g	A	6

Client:	Kleinfelder	**Service Request:**	K1602494
Project:	CCTO-067 - China Lake	**Date Collected:**	03/08/16 14:00
Sample Matrix:	Soil	**Date Received:**	03/10/16 10:00
Sample Name:	KCH067-009	**Units:**	ng/g
Lab Code:	K1602494-001	**Basis:**	Dry

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3550B

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutane Sulfonate	ND U UJ	1.0 (13)	0.20	0.092	1	04/19/16 00:02	3/16/16	
Perfluorooctanoic Acid	**0.35 J** UJ	1.0	0.21 (6)	0.21	1	04/19/16 00:02	3/16/16	
Perfluorooctane Sulfonate	**0.41 J** J	1.0	0.20	0.061	1	04/19/16 00:02	3/16/16	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Sodium perfluoro-1-hexane[18O2]sulfonate	74	70 - 130	04/19/16 00:02	
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	65	70 - 130	04/19/16 00:02	*
Sodium perfluoro-1-[1,2,3,4-13C4] octanesulfonate	80	70 - 130	04/19/16 00:02	

4/29/16

REVISED
9:19 am, Apr 29, 2016

Client:	Kleinfelder	**Service Request:**	K1602494
Project:	CCTO-067 - China Lake	**Date Collected:**	03/08/16 14:05
Sample Matrix:	Soil	**Date Received:**	03/10/16 10:00
Sample Name:	KCH067-010	**Units:**	ng/g
Lab Code:	K1602494-002	**Basis:**	Dry

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3550B

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutane Sulfonate	ND U	0.95	0.20	0.090	1	04/19/16 00:12	3/16/16	
Perfluorooctanoic Acid	ND U	0.95	0.20	0.20	1	04/19/16 00:12	3/16/16	
Perfluorooctane Sulfonate	ND U	0.95	0.20	0.060	1	04/19/16 00:12	3/16/16	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Sodium perfluoro-1-hexane[18O2]sulfonate	83	70 - 130	04/19/16 00:12	
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	73	70 - 130	04/19/16 00:12	
Sodium perfluoro-1-[1,2,3,4-13C4] octanesulfonate	88	70 - 130	04/19/16 00:12	

4/5/16

REVISED
9:19 am, Apr 29, 2016

Client:	Kleinfelder	**Service Request:**	K1602494
Project:	CCTO-067 - China Lake	**Date Collected:**	03/08/16 14:10
Sample Matrix:	Soil	**Date Received:**	03/10/16 10:00
Sample Name:	KCH067-011	**Units:**	ng/g
Lab Code:	K1602494-003	**Basis:**	Dry

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3550B

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutane Sulfonate	ND U UJ	0.92 (13)	0.20	0.090	1	04/19/16 00:22	3/16/16	
Perfluorooctanoic Acid	**0.29 J** UJ	0.92 ↓	0.20 (6)	0.20	1	04/19/16 00:22	3/16/16	
Perfluorooctane Sulfonate	**0.44 J** J	0.92 ↓	0.20	0.060	1	04/19/16 00:22	3/16/16	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Sodium perfluoro-1-hexane[18O2]sulfonate	75	70 - 130	04/19/16 00:22	
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	65	70 - 130	04/19/16 00:22	*
Sodium perfluoro-1-[1,2,3,4-13C4] octanesulfonate	82	70 - 130	04/19/16 00:22	

Ca51716

REVISED
9:19 am, Apr 29, 2016

Client:	Kleinfelder	**Service Request:**	K1602494
Project:	CCTO-067 - China Lake	**Date Collected:**	03/08/16 14:20
Sample Matrix:	Soil	**Date Received:**	03/10/16 10:00
Sample Name:	KCH067-012	**Units:**	ng/g
Lab Code:	K1602494-004	**Basis:**	Dry

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3550B

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutane Sulfonate	ND U	0.95	0.20	0.090	1	04/19/16 00:33	3/16/16	
Perfluorooctanoic Acid	**0.27 J** U (6)	0.95	0.20	0.20	1	04/19/16 00:33	3/16/16	
Perfluorooctane Sulfonate	**0.24 J**	0.95	0.20	0.060	1	04/19/16 00:33	3/16/16	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Sodium perfluoro-1-hexane[18O2]sulfonate	86	70 - 130	04/19/16 00:33	
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	77	70 - 130	04/19/16 00:33	
Sodium perfluoro-1-[1,2,3,4-13C4] octanesulfonate	87	70 - 130	04/19/16 00:33	

4/29/16

REVISED
9:19 am, Apr 29, 2016

Client:	Kleinfelder	**Service Request:**	K1602494
Project:	CCTO-067 - China Lake	**Date Collected:**	03/08/16 14:25
Sample Matrix:	Soil	**Date Received:**	03/10/16 10:00
Sample Name:	KCH067-013	**Units:**	ng/g
Lab Code:	K1602494-005	**Basis:**	Dry

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3550B

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutane Sulfonate	ND U	9.8	2.0	0.90	10	04/19/16 14:10	3/16/16	
Perfluorooctanoic Acid	ND U	9.8	2.0	2.0	10	04/19/16 14:10	3/16/16	
Perfluorooctane Sulfonate	ND U	9.8	2.0	0.60	10	04/19/16 14:10	3/16/16	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Sodium perfluoro-1-hexane[18O2]sulfonate	142	70 - 130	04/19/16 14:10	*
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	147	70 - 130	04/19/16 14:10	*
Sodium perfluoro-1-[1,2,3,4-13C4] octanesulfonate	153	70 - 130	04/19/16 14:10	*

5/5/16

REVISED
9:19 am, Apr 29, 2016

Client:	Kleinfelder	**Service Request:**	K1602494
Project:	CCTO-067 - China Lake	**Date Collected:**	03/08/16 14:30
Sample Matrix:	Soil	**Date Received:**	03/10/16 10:00
Sample Name:	KCH067-014	**Units:**	ng/g
Lab Code:	K1602494-006	**Basis:**	Dry

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3550B

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutane Sulfonate	ND U	0.97	0.20	0.090	1	04/19/16 00:53	3/16/16	
Perfluorooctanoic Acid	**0.21 J** U(6)	0.97	0.20	0.20	1	04/19/16 00:53	3/16/16	
Perfluorooctane Sulfonate	**0.10 J**	0.97	0.20	0.060	1	04/19/16 00:53	3/16/16	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Sodium perfluoro-1-hexane[18O2]sulfonate	82	70 - 130	04/19/16 00:53	
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	85	70 - 130	04/19/16 00:53	
Sodium perfluoro-1-[1,2,3,4-13C4] octanesulfonate	91	70 - 130	04/19/16 00:53	

051716

REVISED
9:19 am, Apr 29, 2016

Client:	Kleinfelder	**Service Request:**	K1602494
Project:	CCTO-067 - China Lake	**Date Collected:**	03/08/16 14:50
Sample Matrix:	Soil	**Date Received:**	03/10/16 10:00
Sample Name:	KCH067-015	**Units:**	ng/g
Lab Code:	K1602494-007	**Basis:**	Dry

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3550B

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutane Sulfonate	ND U	1.0	0.20	0.093	1	04/19/16 14:41	3/16/16	
Perfluorooctanoic Acid	**0.27** J U(6)	1.0	0.21	0.21	1	04/19/16 14:41	3/16/16	
Perfluorooctane Sulfonate	**1.6**	1.0	0.20	0.062	1	04/19/16 14:41	3/16/16	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Sodium perfluoro-1-hexane[18O2]sulfonate	81	70 - 130	04/19/16 14:41	
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	90	70 - 130	04/19/16 14:41	
Sodium perfluoro-1-[1,2,3,4-13C4] octanesulfonate	81	70 - 130	04/19/16 14:41	

5/17/16

REVISED
9:19 am, Apr 29, 2016

Client:	Kleinfelder	**Service Request:**	K1602494
Project:	CCTO-067 - China Lake	**Date Collected:**	03/08/16 15:00
Sample Matrix:	Soil	**Date Received:**	03/10/16 10:00
Sample Name:	KCH067-016	**Units:**	ng/g
Lab Code:	K1602494-008	**Basis:**	Dry

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3550B

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutane Sulfonate	**0.10 J**	0.95	0.20	0.090	1	04/19/16 01:33	3/16/16	
Perfluorooctanoic Acid	**0.24 J** U(6)	0.95	0.20	0.20	1	04/19/16 01:33	3/16/16	
Perfluorooctane Sulfonate	**0.37 J**	0.95	0.20	0.060	1	04/19/16 01:33	3/16/16	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Sodium perfluoro-1-hexane[18O2]sulfonate	76	70 - 130	04/19/16 01:33	
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	77	70 - 130	04/19/16 01:33	
Sodium perfluoro-1-[1,2,3,4-13C4] octanesulfonate	80	70 - 130	04/19/16 01:33	

4/25/16

REVISED
9:19 am, Apr 29, 2016

Analytical Report

Client:	Kleinfelder	**Service Request:**	K1602494
Project:	CCTO-067 - China Lake	**Date Collected:**	03/08/16 17:35
Sample Matrix:	Water	**Date Received:**	03/10/16 10:00
Sample Name:	KCH067-019	**Units:**	ng/L
Lab Code:	K1602494-009	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutane Sulfonate	ND U	4.3	1.2	0.41	1	03/17/16 23:52	3/17/16	
Perfluorooctanoic Acid	**0.47** J 0.804	4.3 (6.7)	0.80	0.27	1	03/17/16 23:52	3/17/16	
Perfluorooctane Sulfonate	ND U	4.3	1.2	0.60	1	03/17/16 23:52	3/17/16	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Sodium perfluoro-1-hexane[18O2]sulfonate	82	20 - 128	03/17/16 23:52	
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	83	13 - 142	03/17/16 23:52	
Sodium perfluoro-1-[1,2,3,4-13C4] octanesulfonate	82	11 - 131	03/17/16 23:52	

4/25/16

Superset Referen

REVISED
9:19 am, Apr 29, 2016

LDC #: 36282F96 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16
SDG #: K1602494 Standard/Full Page: 1 of 1
Laboratory: ALS Environmental Reviewer: EJ
2nd Reviewer: K

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /Δ	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A Δ	%RSD ≤ 25 ICV ≤ 25
IV.	Continuing calibration / closing ccv	Δ	CCV ≤ 25
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	FB = 9 SB = KCH067-042 (K1602709)
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	Δ	
XII.	Compound quantitation RL/LOQ/LODs	Δ	Not reviewed for Standard validation.
XIII.	Target compound identification	Δ	Not reviewed for Standard validation.
XIV.	System performance	Δ	Not reviewed for Standard validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Full validation

	Client ID	Lab ID	Matrix	Date
1	KCH067-009	K1602494-001	Soil	03/08/16
2	KCH067-010	K1602494-002	Soil	03/08/16
3	KCH067-011	K1602494-003	Soil	03/08/16
4	KCH067-012	K1602494-004	Soil	03/08/16
5	KCH067-013	K1602494-005	Soil	03/08/16
6	KCH067-014	K1602494-006	Soil	03/08/16
7	KCH067-015	K1602494-007	Soil	03/08/16
8	KCH067-016**	K1602494-008**	Soil	03/08/16
9	KCH067-019	K1602494-009	Water	03/08/16
10	KCH067-016MS	K1602494-008MS	Soil	03/08/16
11	KCH067-016MSD	K1602494-008MSD	Soil	03/08/16
12				
13	KQ1602426-04			
14	KQ1602477-03			

LDC #: 36282 F96 **VALIDATION FINDINGS CHECKLIST** Page: 1 of 2
Reviewer: F2
2nd Reviewer: M

Method: LC/MS/MS Perfluorinated Alkyl Acids(EPA Method 537)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✗	✓	✓	
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard (%RSD)≤ 25%?	✓			
Was a curve fit used for evaluation?		✓		
Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were all percent differences (%D) ≤ 25?	✓			
Were the RT windows properly established?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) < 25%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
VIII. Internal standards				
Were internal standard area counts within50-150% from the average areas measured during initial calbration?	✓			

LDC #: 36282F96

VALIDATION FINDINGS CHECKLIST

Reviewer: FJ
2nd Reviewer: M

Validation Area	Yes	No	NA	Findings/Comments
Were retention times within ± 30 seconds from the associated calibration standard?	✓			
IX. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
X. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. System performance				
System performance was found to be acceptable.	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XIV. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.	✓			

LDC #: 36282F96

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: FT
2nd Reviewer: [illegible]

METHOD: HPLC/MS (EPA Method 537)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Code = 7

Blank extraction date: 3/17/16 **Blank analysis date:** 3/17/16
Conc. units: ng/L Associated Samples: all water

Compound	Blank ID	Sample Identification							
[redacted]	KQ160277-03	9							
Perfluorooctanoic Acid	0.48		0.47/0.80U						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 36282F96

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: FT
2nd Reviewer: AC

SB = KCH067-042

METHOD: HPLC/MS (EPA Method 537)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

code = 6

Blank units: ng/L **Associated sample units:** ng/L
Sampling date: 3/15/16
Field blank type: (circle one) Field Blank / Rinsate / Other: SB Associated Samples: 9

Compound	Blank ID	Sample Identification								
	SB		9							
Perfluorooctanoic Acid	0.39		0.47 /0.80U							

Blank units: ng/L **Associated sample units:** ng/g
Sampling date: 3/8/16
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: All soils

code = 6

Compound	Blank ID	Sample Identification								
	9	1	3	4	6	7	8			
Perfluorooctanoic Acid	0.47	0.35U	0.29U	0.27U	0.21 J U F1	0.27U	0.24U			

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC #: 36282F96

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: FT
2nd Reviewer: AC

METHOD: LCMS (EPA Method 537)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were percent recoveries (%R) for surrogates within QC limits?

Y (N) N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

code = 13

#	Sample ID	Surrogate	%R (Limits)	Qualifications
	1	*	65 (70-130)	J/UJ/P ND + Det
			( )	
			( )	
	3	*	65 (↓)	↓
			( )	
			( )	
			( )	
	5	all surrogates	outside limit)	no qual 10X DL
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
	* Perfluoro-n-[1,2,3,4-13C4] octanoic acid		( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	
			( )	

LDC #: 36282F96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: HP/LC/MS Perfluorinated Alkyl Acids(EPA Method 537)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (5.0 std)	Recalculated RRF (5.0 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	4/18/16	Perfluorobutane Sulfonate	2.707	2.707	2.782	2.782	11.31	11.31
			Perfluorooctanoic Acid	0.5171	0.5171	0.539	0.539	16.12	16.12
			Perfluorooctane Sulfonate	0.9702	0.9702	0.990	0.990	10.70	10.70
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282F96

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Page: 1 of 1
Reviewer: PD
2nd Reviewer:

METHOD: HP/LC/MS Perfluorinated Alkyl Acids (EPA Method 537)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	041816/2020 CCV	4/18/16	Perfluorobutane Sulfonate	~~20.0~~ F1 2.782	2.824	2.824	1.5	1.5
			Perfluorooctanoic Acid	0.539	0.584	0.584	8.2	8.2
			Perfluorooctane Sulfonate	0.990	1.007	1.007	1.7	1.7
2	041816/2032 CCV	4/19/16	↓	2.782	2.760	2.760	0.8	0.8
			↓	↓	0.495	0.495	8.2	8.2
			↓	↓	0.971	0.971	1.9	1.9
3								

Comments: Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282F96

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer: A

METHOD: HPLC/MS Perfluorinated Alkyl Acids (EPA Method 537)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 8

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Sodium – sulfonate	20.0	15.200	76	76	0
Perfluoro – octanoic	↓	15.3390	77	77	↓
Sodium – octanesulfonate	↓	16.0810	80	80	↓

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

LDC #: 36282F96

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HPLC/MS Perfluorinated Alkyl Acids(EPA Method 537)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSR - SR)/SA Where: SSR = Spiked sample result, SR = Sample result
SA = Spike added

RPD = I MSR - MSDR I * 2/(MSR + MSDR) MSR = Matrix spike percent recovery MSDR = Matrix spike duplicate percent recovery

MS/MSD samples: 10 + 11

Compound	Spike Added (ng/g)		Sample Concentration (ng/g)	Spiked Sample Concentration (ng/g)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		Reported RPD	Recalculated RPD
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	----	----
Perfluorobutane	37.5	39.2	0.10	~~85~~		~~93~~	85	93	93	9	9
Sulfonate				31.9	36.4	85					

Comments: Refer to Matrix Spike/Matrix Spike Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. % RPD based on %R

LDC #: 36282F96

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT
2nd Reviewer: AK

METHOD: HPLC/MS Perfluorinated Alkyl Acids (EPA Method 537)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: KQ1602426-03

Compound	Spike Added (ng/g)		Spiked Sample Concentration (ng/g)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCSD		LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Perfluorobutane Sulfonate	40.0	NA	33.9	NA	85	85				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36282F96

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer: M

METHOD: LC/MS/MS Perfluorinated Alkyl Acids(EPA Method 537)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
RRF	=	Relative response factor of the calibration standard.
V_o	=	Volume or weight of sample pruged in milliliters (ml) or grams (g).
Df	=	Dilution factor.
%S	=	Percent solids, applicable to soils and solid matrices only.

Example: 2/1.0800

Sample I.D. #1, Perfluorobutane Sulfonate

Conc. = $\frac{27576\ (20)\ (2)}{(3674365)(2.782)(1.08)}$

= 0.100 ng/g

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: China Lake CTO 067

LDC Report Date: May 18, 2016

Parameters: Perfluorinated Alkyl Acids

Validation Level: Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): K1602709

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
KCH067-042	K1602709-001	Water	03/15/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) Groundwater and Soil Investigation at Installation Restoration Program Sites 22, 23, 31, 32, 43, and PLOU and Soil Investigation at Areas of Concern 166, 230, and 235, Naval Air Weapons Station China Lake, California (February 2016), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Perfluorinated Alkyl Acids by Environmental Protection Agency (EPA) Method 537

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detect): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Qualification Codes

1 Holding Times
2 Sample Preservation (Cooler Temp)
3 Sample Custody
4 Missing Deliverables
5 Calibration
6 Field Blanks
7 Laboratory Blanks
8 Matrix Spike (%)
9 Matrix Spike Duplicate (RPD or Duplicate Sample Analysis)
10 Laboratory Control Sample
11 ICP Interference Check
12 RPD Between Two Columns
13 Surrogates
14 Field Duplicates
15 Furnace QC
16 Serial Dilution
17 Chemical Recoveries
18 Trip Blanks
19 Internal Standards
20 Linear Range Exceeded
21 Potential False Positives
22 Do not use, other result more technically sound
23 Other

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance was checked as applicable.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 25.0%.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 25.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 25.0%.

The percent differences (%D) of the ending CCVs were less than or equal to 25.0%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
KQ1602838-04	03/28/16	Perfluorooctanoic acid	0.35 ng/L	KCH067-042

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
KCH067-042	Perfluorooctanoic acid	0.39 ng/L	0.80U ng/L

VI. Field Blanks

Sample KCH067-042 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
KCH067-042	03/15/16	Perfluorooctanoic acid	0.39 ng/L	No associated samples in this SDG

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

China Lake CTO 067
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG K1602709

No Sample Data Qualified in this SDG

China Lake CTO 067
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG K1602709

Sample	Compound	Modified Final Concentration	A or P	Code
KCH067-042	Perfluorooctanoic acid	0.80U ng/L	A	7

China Lake CTO 067
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG K1602709

No Sample Data Qualified in this SDG

Analytical Report

Client:	Kleinfelder	**Service Request:**	K1602709
Project:	CCTO-067 - China Lake	**Date Collected:**	03/15/16 14:40
Sample Matrix:	Water	**Date Received:**	03/17/16 10:20
Sample Name:	KCH067-042	**Units:**	ng/L
Lab Code:	K1602709-001	**Basis:**	NA

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Analysis Method: PFC/537M
Prep Method: EPA 3535A

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Perfluorobutane Sulfonate	ND U	4.3	1.2	0.41	1	03/30/16 16:11	3/28/16	
Perfluorooctanoic Acid	**0.39 J** 0.80U	4.3 (7)	0.80	0.27	1	03/30/16 16:11	3/28/16	
Perfluorooctane Sulfonate	ND U	4.3	1.2	0.60	1	03/30/16 16:11	3/28/16	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Sodium perfluoro-1-hexane[18O2]sulfonate	84	20 - 128	03/30/16 16:11	
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	88	13 - 142	03/30/16 16:11	
Sodium perfluoro-1-[1,2,3,4-13C4] octanesulfonate	87	11 - 131	03/30/16 16:11	

ML 051716

LDC #: 36282G96 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/10/16
SDG #: K1602709 Standard Page: 1 of 1
Laboratory: ALS Environmental Reviewer: FT
2nd Reviewer: M

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤ 25 ICV ≤ 25
IV.	Continuing calibration (closing ccv)	A	ccv ≤ 25
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	SB = 1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	QC sample
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	KCH067-042	K1602709-001	Water	03/15/16
2				
3				
4				
5				
6				
7				
8				
9				

Notes:

	K1602838-04						

LDC #: 36282 Q96

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: HPLC/MS (EPA Method 537)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

code = 7

Blank extraction date: 3/28/16 **Blank analysis date:** 3/30/16

Conc. units: ng/L Associated Samples: 1

Compound	Blank ID	Sample Identification							
[redacted]	KQ1602838-04			1					
Perfluorooctanoic Acid	0.35			0.39 J 0.80 U					

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 36282G96

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT
2nd Reviewer: A

METHOD: HPLC/MS (EPA Method 537)

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target compounds detected in the field blanks?

Blank units: ng/L **Associated sample units:** NA
Sampling date: 3/15/16
Field blank type: (circle one) Field Blank / Rinsate / Other: SB Associated Samples: none

Compound	Blank ID	Sample Identification								
	1									
Perfluorooctanoic Acid	0.39									

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC #: 76282

EDD POPULATION COMPLETENESS WORKSHEET

Date: 5.25.16
Page: 1 of 1
2nd Reviewer: JG

The LDC job number listed above was entered by (W).

	EDD Process		Comments/Action
I.	EDD Completeness	-	
Ia.	- All methods present?	✓	
Ib.	- All samples present/match report?	✓	
Ic.	- All reported analytes present?	✓	
Id.	-10% or 100% verification of EDD?	✓	
II.	EDD Preparation/Entry	-	
IIa.	- Carryover U/J?	✓	
IIb.	- Reason Codes used? If so, note which codes	✓	LDC.
IIc.	-Additional Information (QC Level, Validator, Date, Validated Y/N, etc.)	✓	
III.	Reasonableness Checks	-	
IIIa.	- Do all qualified ND results have ND qualifier (i.e. UJ)?	✓	
IIIb.	- Do all qualified detect results have detect qualifier (i.e. J)?	✓	
IIIc.	- If reason codes used, do all qualified results have reason code field populated?	✓	
IIId.	-Does the detect flag require changing for blank qualifiers? If so, are all U results marked ND?	N/A ✓	
IIIe.	- Do blank concentrations in report match EDD, where data was qualified due to blank?	✓	
IIIf.	- Were any results rejected for overall assessment? If so, were results changed to nonreportable?	N/A ✓	
IIIg.	- Is the readme complete? If applicable, were edits or discrepancies listed in the readme?	✓	

Notes: _____

The attached zipped file contains eight files:

File	Format	Description	
1) Readme_ChinaLake_052516.doc	MS Word 2003	A "Readme" file (this document).	
	MS Excel 2007	A spreadsheet for the following SDG(s):	
2) EFW2LabRES.xlsx		16C070	36282A
3) 16C074_EFW2LabRESvalidated.xlsx		16C074	36282B
4) 16C129_EFW2LabRESvalidated.xlsx		16C129	36282C
5) 78915.EFW2LabRESvalidated.xlsx		78915	36282D
6) 78998.EFW2LabRESvalidated.xlsx		78998	36282E
7) K1602494_EFW2LabRESvalidated.xlsx		K1602494	36282F
8) K1602709_EFW2LabRESvalidated.xlsx		K1602709	36282G

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Pei Geng at (760) 827-1100 if you have any questions regarding this electronic data submittal.

LOCATION_NAME	SITE_NAME	INSTALLATION_ID	LOCATION_TYPE	LOCATION_TYPE_DESC	SDG	COORD_X	COORD_Y	ANALYTICAL_METHOD_GRP_DESC	SAMPLE_NAME	SAMPLE_MATRIX	SAMPLE_MATRIX_DESC	COLLECT_DATE
		CHINA_LAKE_NAWS			16C129			Perfluoroalkyl Compounds	KCH067-042	WQ	Water for QC samples	15-Mar-16
		CHINA_LAKE_NAWS			16C129			Perfluoroalkyl Compounds	KCH067-042	WQ	Water for QC samples	15-Mar-16
		CHINA_LAKE_NAWS			16C129			Perfluoroalkyl Compounds	KCH067-042	WQ	Water for QC samples	15-Mar-16