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MCB CAMP LEJEUNE
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VALIDATED DATA PACKAGE, A503731, MCB CAMP LEJEUNE NC
9/4/2015
ENVIRONMENTAL DATA SERVICES

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
MCB CAMP LEJEUNE, NORTH CAROLINA

Client: CH2M HILL, Inc., Virginia Beach, Virginia
SDG: A503731
Laboratory: Environmental Conservation Laboratories, Inc., Orlando, Florida
Site: MCB Camp Lejeune, LTM FY2015 Q3, Site 69, CTO-WE86
Date: September 4, 2015

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	IR69-GW04DD-15B	A503731-01	Water
1MS	IR69-GW04DD-15BMS	A503731-01MS	Water
1MSD	IR69-GW04DD-15BMSD	A503731-01MSD	Water
2	IR69-GW28IW-15B	A503731-02	Water
3	IR69-EB-061715	A503731-03	Water

A full data validation was performed on the analytical data for two water samples and one aqueous equipment blank sample collected on June 15-17, 2015 by CH2M HILL at MCB Camp Lejeune in North Carolina. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis	*Method References*
Pesticides	USEPA SW-846 Methods 8081B
PCBs	USEPA SW-846 Methods 8082A

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods, the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," June 2008;
- and the reviewer's professional judgment.

The following items/criteria were reviewed for this report:

Organics

- Holding times and sample preservation
- Initial and continuing calibration summaries
- Method blank and field blank contamination

- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample (LCS) recoveries
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision
- GC Column Difference

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Overall Usability Issues:

There were no rejections of data.

Overall the data is acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedences of QC criteria.

Pesticides

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days for all samples.

Initial Calibration

- All %RSD and/or correlation coefficient criteria were met.

Continuing Calibration

- All %D criteria were met.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
IR69-EB-061715	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable %R and RPD values.

Laboratory Control Samples

- The LCS sample exhibited acceptable %R values.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

GC Column Difference

- All %D criteria were met.

Polychlorinated Biphenyls (PCBs)

Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days for all samples.

Initial Calibration

- All %RSD and/or correlation coefficient criteria were met.

Continuing Calibration

- All %D criteria were met.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
IR69-EB-061715	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable %R and RPD values.

Laboratory Control Samples

- The LCS sample exhibited acceptable %R values.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

GC Column Difference

- All criteria were met.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 9/9/15

Nancy Weaver
Senior Chemist

Data Qualifiers

U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method.

UJ = The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.

J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL).

J+ = The result is an estimated quantity, but the result may be biased high.

J- = The result is an estimated quantity, but the result may be biased low.

R = The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

NJ = The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

IR69-GW04DD-15B

Laboratory: ENCO Orlando SDG: A503731-CTOWE86

Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water Laboratory ID: A503731-01 File ID: 2FT012.D

Sampled: 06/15/15 14:30 Prepared: 06/22/15 05:15 Analyzed: 06/25/15 14:34

Solids: Preparation: EPA 3510C Initial/Final: 99 mL / 1 mL

Batch: 5F22007 Sequence: AA34497 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.01	0.45	45	44 - 124	
Decachlorobiphenyl	1.01	0.58	57	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1882200000	5.475	1.2131E+09	5.589	

* Values outside of QC limits

MW 9/3/15

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

IR69-GW28IW-15B

Laboratory: ENCO Orlando SDG: A503731-CTOWE86

Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water Laboratory ID: A503731-02 File ID: 2FT013.D

Sampled: 06/15/15 13:25 Prepared: 06/22/15 05:15 Analyzed: 06/25/15 14:46

Solids: Preparation: EPA 3510C Initial/Final: 101 mL / 1 mL

Batch: 5F22007 Sequence: AA34497 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.990	0.73	74	44 - 124	
Decachlorobiphenyl	0.990	0.58	59	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1476700000	5.476	1.2131E+09	5.589	

* Values outside of QC limits

nw 9/3/15

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IR69-EB-061715

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Laboratory: ENCO Orlando SDG: A503731-CTOWE86

Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water Laboratory ID: A503731-03 File ID: 2FT014.D

Sampled: 06/17/15 12:50 Prepared: 06/22/15 05:15 Analyzed: 06/25/15 14:57

Solids: Preparation: EPA 3510C Initial/Final: 100 mL / 1 mL

Batch: 5F22007 Sequence: AA34497 Calibration: 1505052 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
319-84-6	alpha-BHC	1	<0.050	U	0.018	0.050	0.10
1024-57-3	Heptachlor epoxide	1	<0.050	U	0.017	0.050	0.10
60-57-1	Dieldrin	1	<0.050	U	0.013	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.67	67	44 - 124	
Decachlorobiphenyl	1.00	0.55	55	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	1784600000	5.481	1.2131E+09	5.589	

* Values outside of QC limits

NW 9/3/15

ORGANIC ANALYSIS DATA SHEET

EPA 8082A

IR69-GW04DD-15B

Laboratory:	ENCO Orlando	SDG:	A503731-CTOWE86
Client:	CH2M Hill, Inc. (CH025)	Project:	CTO-WE86 MCB Camp Lejeune Site 69

Matrix:	Ground Water	Laboratory ID:	A503731-01	File ID:	2FS019.D
Sampled:	06/15/15 14:30	Prepared:	06/22/15 05:15	Analyzed:	06/24/15 12:02
Solids:		Preparation:	EPA 3510C	Initial/Final:	99 mL / 1 mL

Batch: 5F22008 Sequence: AA34504 Calibration: 1506046 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.01	0.61	60	38 - 142	
Decachlorobiphenyl	1.01	0.91	90	40 - 135	

* Values outside of QC limits

MW 9/3/15

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ORGANIC ANALYSIS DATA SHEET

EPA 8082A

IR69-GW28IW-15B

Laboratory: ENCO Orlando SDG: A503731-CTOWE86

Client: CH2M Hill, Inc. (CH025) Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water Laboratory ID: A503731-02 File ID: 2FS020.D

Sampled: 06/15/15 13:25 Prepared: 06/22/15 05:15 Analyzed: 06/24/15 12:13

Solids: Preparation: EPA 3510C Initial/Final: 101 mL / 1 mL

Batch: 5F22008 Sequence: AA34504 Calibration: 1506046 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.990	0.71	72	38 - 142	
Decachlorobiphenyl	0.990	0.76	77	40 - 135	

* Values outside of QC limits

MW 9/3/15

IR69-EB-061715

ORGANIC ANALYSIS DATA SHEET

EPA 8082A

Laboratory: ENCO Orlando
SDG: A503731-CTOWE86
Client: CH2M Hill, Inc. (CH025)
Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water
Laboratory ID: A503731-03
File ID: 2FS021.D
Sampled: 06/17/15 12:50
Prepared: 06/22/15 05:15
Analyzed: 06/24/15 12:24
Solids:
Preparation: EPA 3510C
Initial/Final: 100 mL / 1 mL
Batch: 5F22008
Sequence: AA34504
Calibration: 1506046
Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
11096-82-5	PCB-1260	1	<1.0	U	0.48	1.0	1.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.82	82	38 - 142	
Decachlorobiphenyl	1.00	0.75	75	40 - 135	

* Values outside of QC limits

NW 9/3/15

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
MCB CAMP LEJEUNE, NORTH CAROLINA

Client: CH2M HILL, Inc., Virginia Beach, Virginia
SDG: A503731
Laboratory: Environmental Conservation Laboratories, Inc., Orlando, Florida
Site: MCB Camp Lejeune, LTM FY2015 Q3, Site 69, CTO-WE86
Date: September 4, 2015

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	IR69-GW04DD-15B	A503731-01	Water
1MS	IR69-GW04DD-15BMS	A503731-01MS	Water
1MSD	IR69-GW04DD-15BMSD	A503731-01MSD	Water
2	IR69-GW28IW-15B	A503731-02	Water
2RE	IR69-GW28IW-15BRE	A503731-02RE	Water
3	IR69-EB-061715	A503731-03	Water

A full data validation was performed on the analytical data for two water samples and one aqueous equipment blank sample collected on June 15-17, 2015 by CH2M HILL at MCB Camp Lejeune in North Carolina. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis	*Method References*
Metals (Cr/Tl)	USEPA SW-846 Methods 6020A

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods, the USEPA National Functional Guidelines for Inorganic Data Review as follows:

- The USEPA "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," January 2010;
- and the reviewer's professional judgment.

The following items/criteria were reviewed for this report:

Inorganics

- Holding times and sample preservation
- ICP/MS Tuning
- Initial and continuing calibration verifications

- Method blank and field blank contamination
- ICP Interference Check Sample
- Laboratory Control Sample (LCS) recoveries
- Matrix Spike Analysis
- Duplicate Sample Analysis
- ICP Serial Dilution
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Overall Usability Issues:

There were no rejections of data.

Overall the data is acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedences of QC criteria.

Metals (Chromium/Thallium)

Holding Times

- All samples were prepared and analyzed within 180 days for all metals.

Initial Calibration Verification

- All initial calibration criteria were met.

Continuing Calibration Verification

- All continuing calibration criteria were met.

Method Blank

- The method blanks were free of contamination.

Field Blank

- The field QC samples exhibited the following contamination.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
IR69-EB-061715	None - ND	-	-	-

ICP Interference Check Sample

- The ICP interference check sample exhibited acceptable %R values.

Laboratory Control Samples

- The LCS sample exhibited acceptable recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD sample exhibited acceptable %R and RPD values.

ICP Serial Dilution

- ICP serial dilution percent differences (%D) were acceptable.

Compound Quantitation

- EDS Sample ID #2 exhibited a high concentration of chromium and was flagged (E) by the laboratory. The sample was reanalyzed at a 50X dilution and the dilution result for chromium should be used for reporting purposes.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 9/9/15

Nancy Weaver
Senior Chemist

Data Qualifiers

U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method.

UJ = The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.

J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL).

J+ = The result is an estimated quantity, but the result may be biased high.

J- = The result is an estimated quantity, but the result may be biased low.

R = The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

NJ = The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

INORGANIC ANALYSIS DATA SHEET

EPA 6020A

IR69-GW04DD-15B

Laboratory: ENCO Orlando
SDG: A503731-CTOWE86
Client: CH2M Hill, Inc. (CH025)
Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water
Laboratory ID: A503731-01
File ID: 062215_RP1_DOD-026
Sampled: 06/15/15 14:30
Prepared: 06/19/15 09:54
Analyzed: 06/22/15 13:31
Solids: 0.00
Preparation: EPA 3005A
Initial/Final: 50 mL / 50 mL
Batch: 5F19008
Sequence: AA34413
Calibration: 1506079
Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	14.5	1		0.450	3.00	5.00	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

MW 9/3/15

INORGANIC ANALYSIS DATA SHEET

EPA 6020A

IR69-GW28IW-15B

Laboratory: ENCO Orlando
SDG: A503731-CTOWE86
Client: CH2M Hill, Inc. (CH025)
Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water
Laboratory ID: A503731-02
File ID: 062215_RP1_DOD-036
Sampled: 06/15/15 13:25
Prepared: 06/19/15 09:54
Analyzed: 06/22/15 14:20
Solids: 0.00
Preparation: EPA 3005A
Initial/Final: 50 mL / 50 mL
Batch: 5F19008
Sequence: AA34413
Calibration: 1506079
Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	108 ~~106~~	50 x J	~~E~~ 22.5 ~~0.450~~		~~3.00~~ 150	~~5.00~~ 250	EPA 6020A
7440-28-0	Thallium	0.632	1		0.0580	0.230	0.400	EPA 6020A

NW 9/3/15

ZRE

INORGANIC ANALYSIS DATA SHEET

EPA 6020A

IR69-GW28IW-15B

Laboratory: ENCO Orlando
SDG: A503731-CTOWE86
Client: CH2M Hill, Inc. (CH025)
Project: CTO-WE86 MCB Camp Lejeune Site 69

use original results

Matrix: Ground Water
Laboratory ID: A503731-02RE1
File ID: 062215_RP1_DOD-037
Sampled: 06/15/15 13:25
Prepared: 06/19/15 09:54
Analyzed: 06/22/15 14:29
Solids: 0.00
Preparation: EPA 3005A
Initial/Final: 50 mL / 50 mL
Batch: 5F19008
Sequence: AA34413
Calibration: 1506079
Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	108	50	J	22.5	150	250	EPA 6020A

exclude

NW 9/3/15

INORGANIC ANALYSIS DATA SHEET

EPA 6020A

IR69-EB-061715

Laboratory: ENCO Orlando
SDG: A503731-CTOWE86
Client: CH2M Hill, Inc. (CH025)
Project: CTO-WE86 MCB Camp Lejeune Site 69

Matrix: Ground Water
Laboratory ID: A503731-03
File ID: 062215_RP1_DOD-024
Sampled: 06/17/15 12:50
Prepared: 06/19/15 09:54
Analyzed: 06/22/15 13:24
Solids: 0.00
Preparation: EPA 3005A
Initial/Final: 50 mL / 50 mL
Batch: 5F19008
Sequence: AA34413
Calibration: 1506079
Instrument: OMICPMS1

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	DL	LOD	LOQ	Method
7440-47-3	Chromium	<3.00	1	U	0.450	3.00	5.00	EPA 6020A
7440-28-0	Thallium	<0.230	1	U	0.0580	0.230	0.400	EPA 6020A

MW 9/3/15