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MCB CAMP LEJUENE
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VALIDATED DATA PACKAGE, A406847, MCB CAMP LEJUENE NC
2/12/2015
ENVIRONMENTAL DATA SERVICES

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
MCB CAMP LEJEUNE, NORTH CAROLINA

Client: CH2M HILL, Inc., Virginia Beach, Virginia
SDG: A406847
Laboratory: Environmental Conservation Laboratories, Inc., Orlando, Florida
Site: MCB Camp Lejeune, LTM FY2015, Q1, Site 89, CTO-WE86
Date: February 12, 2015

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	IR89-SW109-14D	A406847-01	Water
1RE	IR89-SW109-14DRE	A406847-01RE1	Water
2	IR89-SW104-14D	A406847-02	Water
2RE	IR89-SW104-14DRE	A406847-02RE1	Water
3	IR89-SW104D-14D	A406847-03	Water
3RE	IR89-SW104D-14DRE	A406847-03RE1	Water
4	IR89-SW102-14D	A406847-04	Water
4MS	IR89-SW102-14DMS	A406847-04MS	Water
4MSD	IR89-SW102-14DMSD	A406847-04MSD	Water
5	IR89-TB-121014	A406847-05	Water

A full data validation was performed on the analytical data for four water samples and one aqueous trip blank sample collected on December 9-10, 2014 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*
VOCs	USEPA SW-846 Method 8260B

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
- Gas Chromatography/Mass Spectroscopy (GC/MS) Tuning
- 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
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Tentatively Identified Compounds (TICs)
- 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.

Volatile Organic Compounds (VOC)

Holding Times

- All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- All %RSD and/or correlation coefficients and mean RRF criteria were met.

Continuing Calibration

- All %D and RRF criteria were met except the following.

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
12/18/14	1,1,2,2-Tetrachloroethane	38.2%	J/UJ	1, 2, 3

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
IR89-TB-121014	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

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

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

MS/MSD Sample ID	Compound	MS %R/MSD %R/ RPD	Qualifier
4	Vinyl chloride	55%/45%/OK	J/UJ
	cis-1,2-Dichloroethene	69%/43%/OK	
	1,1,2,2-Tetrachloroethane	OK/69%/OK	

Laboratory Control Samples

- The LCS samples exhibited acceptable percent recoveries (%R) except the following.

LCS ID	Compound	%R	Qualifier	Affected Samples
4L18024-BS1	Vinyl chloride	138%	J	1-3

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- EDS Sample ID #s 1, 2, and 3 were reanalyzed due to LCS deficiencies. The original analysis results should be used for reporting purposes since the concentrations are higher than the reanalysis.

Tentatively Identified Compounds (TICs)

- TICs were not reported.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

VOCs				
Compound	IR89-SW104-14D ug/L	IR89-SW104D-14D ug/L	RPD	Qualifier
Vinyl chloride	4.2	3.9	7%	None
trans-1,2-Dichloroethene	5.3	5.6	6%	
cis-1,2-Dichloroethene	14	15	7%	
Trichloroethene	1.0U	1.9	NC	
1,1,2,2-Tetrachloroethane	9.0	9.1	1%	

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

Signed: Nancy Weaver Dated: 2/16/15

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 8260B

IR89-SW109-14D

Laboratory:	ENCO Orlando	SDG:	A406847-CTO-WE86
Client:	CH2M Hill, Inc. (CH025)	Project:	CTO-WE86 MCB Camp Lejeune Site 89

Matrix:	Surface Water	Laboratory ID:	A406847-01	File ID:	3LM017.D
Sampled:	12/09/14 11:10	Prepared:	12/18/14 00:00	Analyzed:	12/18/14 12:37
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 4L18024 Sequence: AA31792 Calibration: 1410074 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-01-4	Vinyl chloride BSH	1	2.0 J	~~Q~~	0.71	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	1.9	J	0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene	1	10		0.53	1.0	2.0
79-01-6	Trichloroethene	1	2.8		0.89	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U~~Q~~	0.76	1.0	2.0
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane CCH	1	5.7 J	~~Q~~	0.54	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	52	104	80 - 119	
Toluene-d8	50.0	48	96	89 - 112	
4-Bromofluorobenzene	50.0	48	96	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	414466	10.92	379991	10.93	
1,4-Difluorobenzene	615806	11.49	504214	11.51	
Chlorobenzene-d5	596388	14.17	534272	14.18	
1,4-Dichlorobenzene-d4	315145	16.42	285596	16.43	

* Values outside of QC limits

MW 2/12/15

IRE

IR89-SW109-14D

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A406847-CTO-WE86
Client:	CH2M Hill, Inc. (CH025)	Project:	CTO-WE86 MCB Camp Lejeune Site 89

Matrix:	Surface Water	Laboratory ID:	A406847-01RE1	File ID:	1LN010.D
Sampled:	12/09/14 11:10	Prepared:	12/19/14 00:00	Analyzed:	12/19/14 08:56
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 4L19007 Sequence: AA31809 Calibration: 1412038 Instrument: OVGCMS1

Use original results

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-01-4	Vinyl chloride	1	1.1	J	0.71	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	1.5	J	0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene	1	7.1		0.53	1.0	2.0
79-01-6	Trichloroethene	1	<1.0	U	0.89	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U	0.76	1.0	2.0
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	2.5		0.54	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	107	80 - 119	
Toluene-d8	50.0	46	92	89 - 112	
4-Bromofluorobenzene	50.0	48	96	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	116804	11.46	135878	11.46	
1,4-Difluorobenzene	196613	12.03	221153	12.03	
Chlorobenzene-d5	171855	14.71	191390	14.71	
1,4-Dichlorobenzene-d4	67352	17.08	82213	17.08	

exclude

* Values outside of QC limits

MW 2/12/15

2

IR89-SW104-14D

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A406847-CTO-WE86
Client:	CH2M Hill, Inc. (CH025)	Project:	CTO-WE86 MCB Camp Lejeune Site 89

Matrix:	Surface Water	Laboratory ID:	A406847-02	File ID:	3LM018.D
Sampled:	12/09/14 11:55	Prepared:	12/18/14 00:00	Analyzed:	12/18/14 13:07
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 4L18024 Sequence: AA31792 Calibration: 1410074 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-01-4	Vinyl chloride BSH	1	4.2 J	~~J~~	0.71	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	5.3		0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene	1	14		0.53	1.0	2.0
79-01-6	Trichloroethene	1	<1.0	U	0.89	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U~~J~~	0.76	1.0	2.0
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane CCH	1	9.0 J	~~J~~	0.54	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	52	105	80 - 119	
Toluene-d8	50.0	49	97	89 - 112	
4-Bromofluorobenzene	50.0	48	95	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	407690	10.92	379991	10.93	
1,4-Difluorobenzene	624877	11.5	504214	11.51	
Chlorobenzene-d5	623089	14.17	534272	14.18	
1,4-Dichlorobenzene-d4	327874	16.43	285596	16.43	

* Values outside of QC limits

MW 2/12/15

2RE

IR89-SW104-14D

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A406847-CTO-WE86
Client:	CH2M Hill, Inc. (CH025)	Project:	CTO-WE86 MCB Camp Lejeune Site 89

Matrix:	Surface Water	Laboratory ID:	A406847-02RE1	File ID:	1LN011.D
Sampled:	12/09/14 11:55	Prepared:	12/19/14 00:00	Analyzed:	12/19/14 09:25
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Use original results

Batch:	4L19007	Sequence:	AA31809	Calibration:	1412038	Instrument:	OVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-01-4	Vinyl chloride	1	2.1		0.71	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	4.4		0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene	1	10		0.53	1.0	2.0
79-01-6	Trichloroethene	1	<1.0	U	0.89	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U	0.76	1.0	2.0
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	7.1		0.54	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	58	116	80 - 119	
Toluene-d8	50.0	48	96	89 - 112	
4-Bromofluorobenzene	50.0	54	107	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	107485	11.46	135878	11.46	
1,4-Difluorobenzene	181025	12.03	221153	12.03	
Chlorobenzene-d5	151626	14.71	191390	14.71	
1,4-Dichlorobenzene-d4	59926	17.08	82213	17.08	

exclude

* Values outside of QC limits

MW 2/12/15

3

IR89-SW104D-14D

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A406847-CTO-WE86
Client:	CH2M Hill, Inc. (CH025)	Project:	CTO-WE86 MCB Camp Lejeune Site 89

Matrix:	Surface Water	Laboratory ID:	A406847-03	File ID:	3LM019.D
Sampled:	12/09/14 12:00	Prepared:	12/18/14 00:00	Analyzed:	12/18/14 13:37
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 4L18024 Sequence: AA31792 Calibration: 1410074 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-01-4	Vinyl chloride BSH	1	3.9 J	~~Q~~	0.71	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	5.6		0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene	1	15		0.53	1.0	2.0
79-01-6	Trichloroethene	1	1.9	J	0.89	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U~~Q~~	0.76	1.0	2.0
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane CCH	1	9.1 J	~~Q~~	0.54	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	56	112	80 - 119	
Toluene-d8	50.0	50	99	89 - 112	
4-Bromofluorobenzene	50.0	51	101	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	396277	10.92	379991	10.93	
1,4-Difluorobenzene	642492	11.5	504214	11.51	
Chlorobenzene-d5	601785	14.17	534272	14.18	
1,4-Dichlorobenzene-d4	321407	16.42	285596	16.43	

* Values outside of QC limits

MW 2/12/15

3RE

IR89-SW104D-14D

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Use original results

Laboratory:	ENCO Orlando			SDG:	A406847-CTO-WE86
Client:	CH2M Hill, Inc. (CH025)			Project:	CTO-WE86 MCB Camp Lejeune Site 89
Matrix:	Surface Water	Laboratory ID:	A406847-03RE1	File ID:	1LN012.D
Sampled:	12/09/14 12:00	Prepared:	12/19/14 00:00	Analyzed:	12/19/14 09:54
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 4L19007 Sequence: AA31809 Calibration: 1412038 Instrument: OVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-01-4	Vinyl chloride	1	2.3		0.71	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	4.7		0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene	1	11		0.53	1.0	2.0
79-01-6	Trichloroethene	1	<1.0	U	0.89	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U	0.76	1.0	2.0
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	7.2		0.54	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	56	111	80 - 119	
Toluene-d8	50.0	47	94	89 - 112	
4-Bromofluorobenzene	50.0	52	105	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	107699	11.46	135878	11.46	
1,4-Difluorobenzene	182828	12.03	221153	12.03	
Chlorobenzene-d5	151901	14.7	191390	14.71	
1,4-Dichlorobenzene-d4	58322	17.09	82213	17.08	

Extreme

* Values outside of QC limits

MW 2/12/15

4

IR89-SW102-14D

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A406847-CTO-WE86
Client:	CH2M Hill, Inc. (CH025)	Project:	CTO-WE86 MCB Camp Lejeune Site 89

Matrix:	Surface Water	Laboratory ID:	A406847-04	File ID:	1LN013.D
Sampled:	12/09/14 12:30	Prepared:	12/19/14 00:00	Analyzed:	12/19/14 10:22
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 4L19007 Sequence: AA31809 Calibration: 1412038 Instrument: OVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-01-4	Vinyl chloride MSL	1	32 J	Ø	0.71	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	16		0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene MSL	1	44 J	Ø	0.53	1.0	2.0
79-01-6	Trichloroethene	1	0.95	J	0.89	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U	0.76	1.0	2.0
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane MSL	1	10 J		0.54	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	57	114	80 - 119	
Toluene-d8	50.0	51	102	89 - 112	
4-Bromofluorobenzene	50.0	54	107	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	106570	11.46	135878	11.46	
1,4-Difluorobenzene	173474	12.03	221153	12.03	
Chlorobenzene-d5	150390	14.71	191390	14.71	
1,4-Dichlorobenzene-d4	57625	17.08	82213	17.08	

* Values outside of QC limits

MW 2/12/15

5

IR89-TB-121014

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A406847-CTO-WE86
Client:	CH2M Hill, Inc. (CH025)	Project:	CTO-WE86 MCB Camp Lejeune Site 89

Matrix:	Water	Laboratory ID:	A406847-05	File ID:	1LN014.D
Sampled:	12/10/14 17:05	Prepared:	12/19/14 00:00	Analyzed:	12/19/14 10:51
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 4L19007 Sequence: AA31809 Calibration: 1412038 Instrument: OVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-01-4	Vinyl chloride	1	<1.0	U	0.71	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	<1.0	U	0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene	1	<1.0	U	0.53	1.0	2.0
79-01-6	Trichloroethene	1	<1.0	U	0.89	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U	0.76	1.0	2.0
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	52	103	80 - 119	
Toluene-d8	50.0	47	94	89 - 112	
4-Bromofluorobenzene	50.0	49	98	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	114552	11.46	135878	11.46	
1,4-Difluorobenzene	184463	12.03	221153	12.03	
Chlorobenzene-d5	161076	14.71	191390	14.71	
1,4-Dichlorobenzene-d4	63054	17.08	82213	17.08	

* Values outside of QC limits

MW 2/12/15