M67001.AR.006917
MCB CAMP LEJUENE
5090.3a

VALIDATED DATA PACKAGE, A407003, MCB CAMP LEJUENE NC
3/11/2015
DATAQUAL ENVIRONMENTAL SERVICES, LLC

DataQual
Environmental Services, LLC

CH2M HILL
14120 Ballantyne Corporate Place
Suite 200
Charlotte, NC 28277

March 11, 2015
SDG# A407003, ENCO
MCB Camp Lejeune-CTO-WE9A

Dear Ms. Kleist,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG #A407003. The data validation was performed in accordance with the SW846 Methods 8260B for volatiles, as well as good professional judgment. Also used in the validation of these samples were The National Functional Guidelines for Organic Data Review (June, 2008) as applicable. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	VOA
IR06-SW09-14D	A407003-01	water	X
IR06-SW09-14D RE	A407003-01RE	water	X
IR06-SW09D-14D	A407003-02	water	X
IR06-SW09D-14D RE	A407003-02 RE	water	X
IR06-SW10-14D	A407003-03	water	X
IR06-SW11-14D	A407003-04	water	X
IR06-SW11-14D RE	A407003-04 RE	water	X
IR06-SW12-14D	A407003-05	water	X
IR06-TB-121014	A407003-06	water	X
IR06-EB-121014	A407003-07	water	X
IR06-SW11-14D MS	A407003-04MS	water	X
IR06-SW11-14D MSD	A407003-04MSD	water	X
IR06-SW11-14D MS RE	A407003-04MS RE	water	X
IR06-SW11-14D MSD RE	A407003-04MSD RE	water	X

The following quality control samples were provided with this SDG: sample IR06-SW09D-14D – field duplicate of sample IR06-SW09-14D; IR06-EB-121014-equipment blank and IR06-TB-121014 -trip blank.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Technical Holding Times *
- GC/MS Tunes *
- Initial/Continuing Calibrations
- Blanks *

- GC/MS Internal Standards *
- Surrogates *
- Laboratory Control Samples *
- Matrix Spike Recoveries *
- Matrix Spike Duplicate RPDs *
- Field Duplicates *
- Identification/Quantitation
- Reporting Limits *

* - indicates that no qualifications were required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

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

VOA

Qualifications were required based on high %RSDs which were exhibited in the initial calibration.

Several samples were re-analyzed for various reasons which are discussed in the *Identification/Quantitation* section of this report. In all case, the initial analysis was excluded in favor of the re-analysis.

Specific Evaluation of Data

Data Completeness

The SDG was received complete and intact. Resubmissions were not required.

Technical Holding Times

According to chain of custody records, sampling was performed on 12/10/14 and samples were received at the laboratory between 12/11/14. All sample preparation and analysis was performed within method holding time requirements.

Initial/Continuing Calibration

VOA

Calibration standards exhibited %RSDs that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results were qualified as indicated.

Standard ID	Compound(s)	%RSD	Samples	Q Flag	Q Code
IC 12/18/14	vinyl chloride	18.23	all samples	J/UJ	ICH
	1,1-dichloroethene	21.83			
	trans-1,2-dichloroethene	19.43			
	cis-1,2-dichloroethene	16.46			
	trichloroethene	17.43			
	1,2-dichloropropane	16.08			

Identification/Quantitation

VOA

The initial analysis of sample IR06-SW09D-14D exhibited high recoveries for all surrogates. The sample was re-analyzed with compliant recoveries exhibited; therefore the initial analysis was excluded in favor of the re-analysis.

The initial analysis of IR06-SW11-14D MS/MSD exhibited several non-compliant recoveries. The MS and MSD were re-analyzed with compliant recoveries exhibited. For validation the MS/MSD re-analysis was used. Please note that there are no data validation qualifications applied to the MS and MSD. This information is included to identify which set of matrix spikes were applied to the data.

The lab suspected matrix interference in the initial analysis of sample IR06-SW09-14D and therefore analyzed the sample at a dilution. The sample was re-analyzed without a dilution and no interference was exhibited; therefore the initial analysis was excluded in favor of the lesser dilution of the re-analysis.

Sample IR06-SW11-14D was re-analyzed with the associated matrix spike and matrix spike duplicate. Since the re-analysis of the matrix spikes was used the re-analysis of the sample was also used and the initial analysis was excluded.

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

Sincerely,

Laura Maschhoff

Laura Maschhoff
President

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q-Flag	Q Code
all samples	vinyl chloride 1,1-dichloroethene trans-1,2-dichloroethene cis-1,2-dichloroethene trichloroethene 1,2-dichloropropane	+/-	J/UJ	ICH
IR06-SW09-14D , IR06-SW09D-14D, IR06-SW11-14D,	all results	+/-	exclude	RE

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
R	result is rejected; the presence or absence of the analyte cannot be verified
NJ	analyte has been tentatively identified, estimated value
L/J-	analyte present, biased low
UL	not detected, quantitation limit is probably higher
K/J+	analyte present, biased high

Inorganic Field/Lab Blank Qualification Flags (Q-Flags)

NA	The sample result for the blank contaminant is greater than the sample RL and is greater than 10X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.
RL-U	The sample result for the blank contaminant is less than the sample RL and the result is raised to the RL and flagged U.
R or J_+	The blank contaminant concentration was greater than the RL and the sample result is greater than the RL but less than 10X the blank contaminant concentration. The reported results are flagged either as rejected R or biased high J+ based on the professional judgment of the validator.

Organic Field/Lab Blank Qualification Flags (Q-Flags)

NA	The sample result for the blank contaminant is greater than the sample RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
RL-U	The sample result for the blank contaminant is less than the sample RL, so the result is raised to the RL and flagged U.

General Abbreviations

RL	reporting limit
DL	detection limit
LOD	limit of detection
LOQ	limit of quantitation
Q Code	qualifier code
+ / -	positive result/non-detect result

QUALIFIER CODE REFERENCE

Qualifier	Description
TN	Tune
BSL	Blank Spike/LCS - High Recovery
BSH	Blank Spike/LCS - Low Recovery
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
ISL	Internal Standard - Low Recovery
ISH	Internal Standard - High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate - Low Recovery
MSH	Matrix Spike and/or Matrix Spike Duplicate - High Recovery
MI	Matrix interference obscuring the raw data
MDP	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source - Bad reproducibility between tandem detectors
SSL	Spiked Surrogate - Low Recovery
SSH	Spiked Surrogate - High Recovery
SD	Serial Dilution Reproducibility
ICL	Initial Calibration - Low Relative Response Factors (RRF)
ICH	Initial Calibration - High Relative Response Factors (RRF)
ICB	Initial Calibration - Bad Linearity or Curve Function
CCL	Continuing Calibration - Low Recovery or %Difference
CCH	Continuing Calibration - High Recovery or %Difference
CC	Continuing Calibration
LD	Lab Duplicate Reproducibility
HT	Holding Time
PD	Pesticide Degradation
2C	Second Column - Poor Dual Column Reproducibility
LR	Concentration Exceeds Linear Range
BL	Blank Contamination (MBL, EBL, FBL, TBL)
RE	Redundant Result - due to Re-analysis or Re-extraction
DL	Redundant Result - due to Dilution
FD	Field Duplicate
OT	Other - explained in data validation report
%SOL	High moisture content

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

IR06-SW09-14D

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Matrix: Surface Water

Laboratory ID: A407003-01

File ID: 1LQ015.D

Sampled: 12/10/14 08:35

Prepared: 12/22/14 00:00

Analyzed: 12/22/14 13:21

Solids:

Preparation: EPA 5030B_MS

Initial/Final: 5 mL / 5 mL

Batch: 4L22056 Sequence: AA31856 Calibration: 1412038 Instrument: OVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
74-87-3	Chloromethane	10	<10	UD	8.2	10	20
75-01-4	Vinyl chloride	10	<10	UD	7.1	10	20
75-35-4	1,1-Dichloroethene	10	<10	UD	9.4	10	20
156-60-5	trans-1,2-Dichloroethene	10	<10	UD	7.3	10	20
156-59-2	cis-1,2-Dichloroethene	10	<10	UD	5.3	10	20
67-66-3	Chloroform	10	<10	UD	8.0	10	20
107-06-2	1,2-Dichloroethane	10	<10	UD	6.3	10	20
71-43-2	Benzene	10	<10	UD	7.1	10	20
79-01-6	Trichloroethene	10	<10	UD	8.9	10	20
78-87-5	1,2-Dichloropropane	10	<10	UD	8.0	10	20
79-00-5	1,1,2-Trichloroethane	10	<10	UD	7.6	10	20
127-18-4	Tetrachloroethene	10	<10	UD	7.6	10	20
108-90-7	Chlorobenzene	10	<10	UD	7.2	10	20
100-41-4	Ethylbenzene	10	<10	UD	6.9	10	20
79-34-5	1,1,2,2-Tetrachloroethane	10	<10	UD	5.4	10	20
106-46-7	1,4-Dichlorobenzene	10	<10	UD	7.6	10	20

XRE

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	58	115	72 - 131	
Toluene-d8	50.0	50	101	89 - 112	
4-Bromofluorobenzene	50.0	54	107	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	116705	11.47	135878	11.46	
1,4-Difluorobenzene	188457	12.04	221153	12.03	
Chlorobenzene-d5	161217	14.72	191390	14.71	

* Values outside of QC limits

MM
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ORGANIC ANALYSIS DATA SHEET

EPA 8260B

IR06-SW09-14D

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Matrix: Surface Water

Laboratory ID: A407003-01RE1

File ID: 2LR008.D

Sampled: 12/10/14 08:35

Prepared: 12/23/14 00:00

Analyzed: 12/23/14 07:59

Solids:

Preparation: EPA 5030B_MS

Initial/Final: 5 mL / 5 mL

Batch: 4L23033 Sequence: AA31863 Calibration: 1412083 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0
75-01-4	Vinyl chloride	1	<1.0 UJICH	~~U~~	0.71	1.0	2.0
75-35-4	1,1-Dichloroethene	1	<1.0	~~U~~	0.94	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 JICH	~~J~~	0.53	1.0	2.0
67-66-3	Chloroform	1	<1.0	U	0.80	1.0	2.0
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0
79-01-6	Trichloroethene	1	0.95 JICH	~~J~~	0.89	1.0	2.0
78-87-5	1,2-Dichloropropane	1	<1.0 UJICH	~~U~~	0.80	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
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	109	72 - 131	
Toluene-d8	50.0	52	104	89 - 112	
4-Bromofluorobenzene	50.0	50	100	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	464065	10.99	460789	10.98	
1,4-Difluorobenzene	808284	11.57	805842	11.56	
Chlorobenzene-d5	700183	14.25	708168	14.23	

* Values outside of QC limits

VM 130115

009

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

IR06-SW09D-14D

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Matrix: Surface Water

Laboratory ID: A407003-02

File ID: 1LQ016.D

Sampled: 12/10/14 08:40

Prepared: 12/22/14 00:00

Analyzed: 12/22/14 13:50

Solids:

Preparation: EPA 5030B_MS

Initial/Final: 5 mL / 5 mL

Batch: 4L22056 Sequence: AA31856 Calibration: 1412038 Instrument: OVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
74-87-3	Chloromethane	10	<10	UD	8.2	10	20
75-01-4	Vinyl chloride	10	<10	UD	7.1	10	20
75-35-4	1,1-Dichloroethene	10	<10	UD	9.4	10	20
156-60-5	trans-1,2-Dichloroethene	10	<10	UD	7.3	10	20
156-59-2	cis-1,2-Dichloroethene	10	<10	UD	5.3	10	20
67-66-3	Chloroform	10	<10	UD	8.0	10	20
107-06-2	1,2-Dichloroethane	10	<10	UD	6.3	10	20
71-43-2	Benzene	10	<10	UD	7.1	10	20
79-01-6	Trichloroethene	10	<10	UD	8.9	10	20
78-87-5	1,2-Dichloropropane	10	<10	UD	8.0	10	20
79-00-5	1,1,2-Trichloroethane	10	<10	UD	7.6	10	20
127-18-4	Tetrachloroethene	10	<10	UD	7.6	10	20
108-90-7	Chlorobenzene	10	<10	UD	7.2	10	20
100-41-4	Ethylbenzene	10	<10	UD	6.9	10	20
79-34-5	1,1,2,2-Tetrachloroethane	10	<10	UD	5.4	10	20
106-46-7	1,4-Dichlorobenzene	10	<10	UD	7.6	10	20

XRE

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	69	138	72 - 131	*
Toluene-d8	50.0	60	120	89 - 112	*
4-Bromofluorobenzene	50.0	66	132	85 - 114	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	92764	11.47	135878	11.46	
1,4-Difluorobenzene	148686	12.05	221153	12.03	
Chlorobenzene-d5	126966	14.72	191390	14.71	

* Values outside of QC limits

VM 030115

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ORGANIC ANALYSIS DATA SHEET

EPA 8260B

IR06-SW09D-14D

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Matrix: Surface Water

Laboratory ID: A407003-02RE1

File ID: 2LR009.D

Sampled: 12/10/14 08:40

Prepared: 12/23/14 00:00

Analyzed: 12/23/14 08:29

Solids:

Preparation: EPA 5030B_MS

Initial/Final: 5 mL / 5 mL

Batch: 4L23033 Sequence: AA31863 Calibration: 1412083 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0
75-01-4	Vinyl chloride	1	<1.0 UJICH	~~U~~	0.71	1.0	2.0
75-35-4	1,1-Dichloroethene	1	<1.0	~~U~~	0.94	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 JICH	~~J~~	0.53	1.0	2.0
67-66-3	Chloroform	1	<1.0	U	0.80	1.0	2.0
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0
79-01-6	Trichloroethene	1	0.91 JICH	~~J~~	0.89	1.0	2.0
78-87-5	1,2-Dichloropropane	1	<1.0 UJICH	~~U~~	0.80	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
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	108	72 - 131	
Toluene-d8	50.0	51	102	89 - 112	
4-Bromofluorobenzene	50.0	51	102	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	462828	10.99	460789	10.98	
1,4-Difluorobenzene	814693	11.57	805842	11.56	
Chlorobenzene-d5	689820	14.25	708168	14.23	

* Values outside of QC limits

VM 030115

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

IR06-SW10-14D

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Matrix: Surface Water

Laboratory ID: A407003-03

File ID: 2LR010.D

Sampled: 12/10/14 08:55

Prepared: 12/23/14 00:00

Analyzed: 12/23/14 08:59

Solids:

Preparation: EPA 5030B_MS

Initial/Final: 5 mL / 5 mL

Batch: 4L23033 Sequence: AA31863 Calibration: 1412083 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0
75-01-4	Vinyl chloride	1	<1.0 UJ JCH	~~U~~	0.71	1.0	2.0
75-35-4	1,1-Dichloroethene	1	<1.0	~~U~~	0.94	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	0.62 JJCH	~~J~~	0.53	1.0	2.0
67-66-3	Chloroform	1	8.4		0.80	1.0	2.0
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0
79-01-6	Trichloroethene	1	<1.0 UJ JCH	~~U~~	0.89	1.0	2.0
78-87-5	1,2-Dichloropropane	1	<1.0 UJ JCH	~~U~~	0.80	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
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	107	72 - 131	
Toluene-d8	50.0	51	102	89 - 112	
4-Bromofluorobenzene	50.0	51	102	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	458923	11	460789	10.98	
1,4-Difluorobenzene	819036	11.57	805842	11.56	
Chlorobenzene-d5	685265	14.24	708168	14.23	

* Values outside of QC limits

VM 030115

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

IR06-SW11-14D

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Matrix: Surface Water

Laboratory ID: A407003-04

File ID: 1LQ017.D

Sampled: 12/10/14 09:00

Prepared: 12/22/14 00:00

Analyzed: 12/22/14 14:19

Solids:

Preparation: EPA 5030B_MS

Initial/Final: 0.5 mL / 5 mL

Batch: 4L22056 Sequence: AA31856 Calibration: 1412038 Instrument: OVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
74-87-3	Chloromethane	1	<10	XRE U	8.2	10	20
75-01-4	Vinyl chloride	1	<10	U	7.1	10	20
75-35-4	1,1-Dichloroethene	1	<10	UQ	9.4	10	20
156-60-5	trans-1,2-Dichloroethene	1	<10	UQ	7.3	10	20
156-59-2	cis-1,2-Dichloroethene	1	<10	UQ	5.3	10	20
67-66-3	Chloroform	1	<10	UQ	8.0	10	20
107-06-2	1,2-Dichloroethane	1	<10	U	6.3	10	20
71-43-2	Benzene	1	<10	UQ	7.1	10	20
79-01-6	Trichloroethene	1	<10	UQ	8.9	10	20
78-87-5	1,2-Dichloropropane	1	<10	UQ	8.0	10	20
79-00-5	1,1,2-Trichloroethane	1	<10	UQ	7.6	10	20
127-18-4	Tetrachloroethene	1	<10	UQ	7.6	10	20
108-90-7	Chlorobenzene	1	<10	UQ	7.2	10	20
100-41-4	Ethylbenzene	1	<10	UQ	6.9	10	20
79-34-5	1,1,2,2-Tetrachloroethane	1	<10	U	5.4	10	20
106-46-7	1,4-Dichlorobenzene	1	<10	UQ	7.6	10	20

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	500	550	109	72 - 131	
Toluene-d8	500	480	97	89 - 112	
4-Bromofluorobenzene	500	510	103	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	117538	11.47	135878	11.46	
1,4-Difluorobenzene	185501	12.05	221153	12.03	
Chlorobenzene-d5	161235	14.73	191390	14.71	

* Values outside of QC limits

LM
030115

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

IR06-SW11-14D

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Matrix: Surface Water

Laboratory ID: A407003-04RE1

File ID: 2LR011.D

Sampled: 12/10/14 09:00

Prepared: 12/23/14 00:00

Analyzed: 12/23/14 09:30

Solids:

Preparation: EPA 5030B_MS

Initial/Final: 5 mL / 5 mL

Batch: 4L23033 Sequence: AA31863 Calibration: 1412083 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0
75-01-4	Vinyl chloride	1	<1.0 UJ ICH	~~U~~	0.71	1.0	2.0
75-35-4	1,1-Dichloroethene	1	<1.0	~~U~~	0.94	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	1.1 J ICH	~~J~~	0.53	1.0	2.0
67-66-3	Chloroform	1	<1.0	U	0.80	1.0	2.0
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0
79-01-6	Trichloroethene	1	0.98 J ICH	~~J~~	0.89	1.0	2.0
78-87-5	1,2-Dichloropropane	1	<1.0 UJ ICH	~~U~~	0.80	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
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	108	72 - 131	
Toluene-d8	50.0	51	101	89 - 112	
4-Bromofluorobenzene	50.0	51	102	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	454948	10.99	460789	10.98	
1,4-Difluorobenzene	807495	11.56	805842	11.56	
Chlorobenzene-d5	688403	14.24	708168	14.23	

* Values outside of QC limits

VM 030115

014

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

IR06-SW12-14D

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Matrix: Surface Water

Laboratory ID: A407003-05

File ID: 2LR012.D

Sampled: 12/10/14 09:15

Prepared: 12/23/14 00:00

Analyzed: 12/23/14 09:59

Solids:

Preparation: EPA 5030B_MS

Initial/Final: 5 mL / 5 mL

Batch: 4L23033 Sequence: AA31863 Calibration: 1412083 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0
75-01-4	Vinyl chloride	1	<1.0 UJ JCH	~~U~~	0.71	1.0	2.0
75-35-4	1,1-Dichloroethene	1	<1.0	~~U~~	0.94	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	0.84 J JCH	~~J~~	0.53	1.0	2.0
67-66-3	Chloroform	1	<1.0	U	0.80	1.0	2.0
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0
79-01-6	Trichloroethene	1	<1.0 UJ JCH	~~U~~	0.89	1.0	2.0
78-87-5	1,2-Dichloropropane	1	<1.0 UJ JCH	~~U~~	0.80	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
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	109	72 - 131	
Toluene-d8	50.0	52	103	89 - 112	
4-Bromofluorobenzene	50.0	51	102	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	449261	10.99	460789	10.98	
1,4-Difluorobenzene	795218	11.56	805842	11.56	
Chlorobenzene-d5	681190	14.24	708168	14.23	

* Values outside of QC limits

VM 03/01/15

015

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

IR06-TB-121014

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Matrix: Water

Laboratory ID: A407003-06

File ID: 2LR006.D

Sampled: 12/10/14 09:20

Prepared: 12/23/14 00:00

Analyzed: 12/23/14 06:59

Solids:

Preparation: EPA 5030B_MS

Initial/Final: 5 mL / 5 mL

Batch: 4L23033 Sequence: AA31863 Calibration: 1412083 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0
75-01-4	Vinyl chloride	1	<1.0	UJ CH ~~U~~	0.71	1.0	2.0
75-35-4	1,1-Dichloroethene	1	<1.0	~~U~~	0.94	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
67-66-3	Chloroform	1	<1.0	U	0.80	1.0	2.0
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0
79-01-6	Trichloroethene	1	<1.0	UJ CH ~~U~~	0.89	1.0	2.0
78-87-5	1,2-Dichloropropane	1	<1.0	~~U~~	0.80	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
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	108	72 - 131	
Toluene-d8	50.0	51	102	89 - 112	
4-Bromofluorobenzene	50.0	50	100	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	457373	10.99	460789	10.98	
1,4-Difluorobenzene	802328	11.57	805842	11.56	
Chlorobenzene-d5	695164	14.24	708168	14.23	

* Values outside of QC limits

UM 03/01/15

016

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

IR06-EB-121014

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Matrix: Water

Laboratory ID: A407003-07

File ID: 2LR007.D

Sampled: 12/10/14 09:30

Prepared: 12/23/14 00:00

Analyzed: 12/23/14 07:29

Solids:

Preparation: EPA 5030B_MS

Initial/Final: 5 mL / 5 mL

Batch: 4L23033 Sequence: AA31863 Calibration: 1412083 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0
75-01-4	Vinyl chloride	1	<1.0	UJ ICH ~~U~~	0.71	1.0	2.0
75-35-4	1,1-Dichloroethene	1	<1.0	~~U~~	0.94	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
67-66-3	Chloroform	1	<1.0	U	0.80	1.0	2.0
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0
79-01-6	Trichloroethene	1	<1.0	UJ ICH ~~U~~	0.89	1.0	2.0
78-87-5	1,2-Dichloropropane	1	<1.0	~~U~~	0.80	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
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	108	72 - 131	
Toluene-d8	50.0	51	101	89 - 112	
4-Bromofluorobenzene	50.0	50	100	85 - 114	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	461020	10.99	460789	10.98	
1,4-Difluorobenzene	813887	11.57	805842	11.56	
Chlorobenzene-d5	690261	14.24	708168	14.23	

* Values outside of QC limits

VM 030115

017

Data Completeness

The data package was received complete and intact. Resubmissions were not required. (SW846 Method 8260C)

Laboratory: ENCO

Holding Times

Sampling Date: 12/10/14
Received Date: 12/11/14
Analysis Dates: 12/22-23/14
Cooler Temp: 0°C

All holding time requirements were met.

Calibrations

Mass assignments were verified by the injection of BFB.

Qualifications were required for the initial calibration due to high %RSDs, see attached Form VI.

Internal Standards

All criteria were met.

Blank Summary

Blank qualification guidelines:

- No action is taken if a compound is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying criteria.
- Qualification/Action codes where applied as stated in table below:

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Field	Detects	Not detected	No qualifications
	< LOD*	< LOD*	Report LOD value with a U
		≥ LOD*	Use professional judgment
	> LOD*	< LOD*	Report LOD value with a U
		≥ LOD* and < blank concentration	Report the concentration for the sample with a U, or qualify the data as unusable R
		≥ LOD* and ≥ blank concentration	Use professional judgment
	= LOD*	< LOD*	Report LOD value with a U
		≥ LOD*	Use professional judgment
	Gross contamination	Detects	Qualify results as unusable R

*2x the LOD for methylene chloride, 2-butanone and acetone

Contamination was not exhibited in the method blanks. Associated QC blanks: IR06-TB-121014- trip blank (no

positive results) and IR06-EB-121014- equipment blank (no positive results).

Blank Contamination and Qualification Summaries

Blank ID	Compound	Concentration	Reporting Limit (LOD)
no qualifications			

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Qual Code

Surrogates

The initial analysis of sample IR06-SW09D-14D exhibited high recoveries for all surrogates. The sample was re-analyzed with compliant recoveries exhibited; therefore the initial analysis was excluded in favor of the re-analysis.

Laboratory Control Sample

All criteria were met.

Matrix Spike/Spike Duplicate Samples

The initial analysis of IR06-SW11-14D MS/MSD exhibited several non-compliant recoveries. The MS and MSD were re-analyzed with compliant recoveries exhibited; therefore the initial analysis was excluded in favor of the re-analysis.

Field Duplicate Sample

A field duplicate was submitted for sample IR06-SW09-14D4A- no qualifications were required, see attached sheet.

Specific Comments:

All sample results were reported within the calibration range of the instruments.

The lab suspected matrix interference in the initial analysis of sample IR06-SW09-14D and therefore analyzed the sample at a dilution. The sample was re-analyzed without a dilution and no interference was exhibited; therefore the initial analysis was excluded in favor of the lesser dilution of the re-analysis. Sample IR06-SW11-14D was re-analyzed with the associated matrix spike and matrix spike duplicate. Since the re-analysis of the matrix spikes are used the re-analysis of the sample was also used and the initial analysis was excluded.

Detection limits were acceptable. Raw data and calculations were verified.

We have limited the supporting documentation, found with these worksheets, to those forms that indicate qualifications were required.

Validator Signature: _____ **Date:** 2/28/15

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260B

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

Sequence: AA31801

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Instrument: OVGCMS2

Calibration: 1412083

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA31801-TUN1	2LM004.D	12/18/14 09:38
Cal Standard	AA31801-CAL1	2LM005.D	12/18/14 10:16
Cal Standard	AA31801-CAL2	2LM006.D	12/18/14 10:46
Cal Standard	AA31801-CAL3	2LM007.D	12/18/14 11:16
Cal Standard	AA31801-CAL4	2LM008.D	12/18/14 11:46
Cal Standard	AA31801-CAL5	2LM009.D	12/18/14 12:16
Cal Standard	AA31801-CAL6	2LM010.D	12/18/14 12:47
Cal Standard	AA31801-CAL7	2LM011.D	12/18/14 13:16
Cal Standard	AA31801-CAL8	2LM012.D	12/18/14 13:46
Secondary Cal Check	AA31801-SCV1	2LM014.D	12/18/14 14:46

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260B

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

Sequence: AA31863

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Instrument: OVGCMS2

Calibration: 1412083

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA31863-TUN1	2LR001.D	12/23/14 04:22
Calibration Check	AA31863-CCV1	2LR002.D	12/23/14 04:54
LCS	4L23033-BS1	2LR004.D	12/23/14 05:59
Blank	4L23033-BLK1	2LR005.D	12/23/14 06:29
IR06-TB-121014	A407003-06	2LR006.D	12/23/14 06:59
IR06-EB-121014	A407003-07	2LR007.D	12/23/14 07:29
IR06-SW09-14D	A407003-01RE1	2LR008.D	12/23/14 07:59
IR06-SW09D-14D	A407003-02RE1	2LR009.D	12/23/14 08:29
IR06-SW10-14D	A407003-03	2LR010.D	12/23/14 08:59
IR06-SW11-14D	A407003-04RE1	2LR011.D	12/23/14 09:30
IR06-SW12-14D	A407003-05	2LR012.D	12/23/14 09:59
IR06-SW11-14D	4L23033-MS1	2LR013.D	12/23/14 10:29
IR06-SW11-14D	4L23033-MSD1	2LR014.D	12/23/14 10:59
Low Cal Check	AA31863-LCV1	2LR022.D	12/23/14 15:06

Response Factor Report OVGCMS2

Method : C:\HPCHEM\1\METHODS\121814.M (RTE Integrator)
Title : ENCO SOPVGCMS/05;element cal 1402044
Last Update : Thu Dec 18 15:42:42 2014
Response via : Initial Calibration

Calibration 1412083

Calibration Files
1 =2LM005.D 5 =2LM007.D 20 =2LM008.D 2= 2LM006
50 =2LM009.D 100 =2LM011.D 200 =2LM012.D 80= 2LM00

All LR except Iodomethane

		Compound	1	5	20	50	100	200	Avg	%RSD	
1)	i	Pentafluorobenzene(IS	----------ISTD----------								
2)		Dichlorodifluoromet	0.236	0.277	0.409	0.424	0.416	0.421	0.361	23.48	
3)	**	Chloromethane	0.579	0.429	0.569	0.607	0.621	0.674	0.575	14.18	
4)	*	Vinyl Chloride	0.488	0.460	0.652	0.688	0.686	0.695	0.606	18.23	J/UJ
5)		Bromomethane	0.390	0.193	0.212	0.221	0.227	0.222	0.242	25.45	
6)		Chloroethane	0.308	0.285	0.375	0.379	0.326		0.331	11.95	
7)		Trichlorofluorometh	0.518	0.402	0.588	0.595	0.591	0.599	0.542	15.78	
8)		Trichlorotrifluoroe	0.338	0.277	0.454	0.487	0.483	0.473	0.410	23.63	
9)		acrolein	0.041	0.051	0.064	0.070	0.066	0.067	0.060#	17.14	
10)		Acetone	0.164	0.123	0.156	0.158	0.153	0.152	0.151	8.22	
11)	*m	1,1-Dichloroethene	0.322	0.265	0.425	0.466	0.472	0.459	0.397	21.83	J/UJ
12)		3-Chloropropene	0.203	0.221	0.312	0.331	0.332	0.327	0.282	21.35	
13)		Acetonitrile	0.051	0.063	0.080	0.090	0.086	0.087	0.077#	17.84	
14)		Iodomethane	0.180	0.112	0.143	0.216	0.347	0.341	0.221	44.51	-QR
15)		Carbon disulfide	0.998	1.095	1.475	1.538	1.508	1.494	1.318	20.15	
16)		Methylene Chloride	0.580	0.450	0.549	0.636	0.631	0.634	0.586	10.82	
17)		Methyl tert-butyl e	1.115	0.943	1.277	1.457	1.422	1.442	1.263	16.33	
18)		Acrylonitrile	0.142	0.173	0.226	0.242	0.222	0.221	0.205	16.83	
19)		T-1,2-Dichloroethen	0.349	0.348	0.500	0.559	0.547	0.551	0.475	19.43	J/UJ
20)		Isopropyl Ether	1.971	1.653	2.132	2.447	2.412	2.424	2.156	14.46	
21)		C-1,2-Dichloroethen	0.452	0.424	0.543	0.613	0.611	0.621	0.537	16.46	J/UJ
22)	**	1,1-Dichloroethane	0.772	0.703	0.897	1.017	1.003	1.013	0.898	14.45	
23)		Vinyl Acetate	0.932	1.076	1.433	1.497	1.467	1.457	1.308	17.10	
24)		Chloroprene	0.405	0.487	0.709	0.744	0.745	0.738	0.624	25.14	
25)		2-Butanone	0.012	0.040	0.055	0.063	0.058	0.059	0.049#	33.76	
26)		Propionitrile	0.045	0.056	0.076	0.078	0.073	0.068	0.065#	18.85	
27)		2,2-Dichloropropane	0.466	0.422	0.631	0.694	0.681	0.689	0.591	20.49	
28)		Methacrylonitrile	0.165	0.171	0.227	0.235	0.221	0.204	0.204	13.41	
29)	*	Chloroform	0.819	0.656	0.835	0.945	0.925	0.929	0.848	12.11	
30)	s	Dibromofluoromethan		0.259	0.530	0.592	0.585	0.545	0.483	30.90	
31)		Dibromofluoromethan		0.259	0.530	0.592	0.585	0.545	0.483	30.90	
32)		Bromochloromethane	0.161	0.196	0.260	0.299	0.290	0.285	0.249	20.73	
33)		1,1,1-Trichloroetha	0.439	0.395	0.576	0.644	0.631	0.634	0.547	19.90	
34)		1,1-Dichloropropene	0.523	0.417	0.647	0.704	0.715	0.711	0.610	20.64	
35)		Diethyl ether	0.422	0.395	0.478	0.542	0.537	0.543	0.485	12.71	
36)		Methyl Acetate	0.102	0.090	0.112	0.124	0.123	0.124	0.112	10.73	
37)		Cyclohexane	0.613	0.515	0.921	0.997	0.984	0.962	0.820	26.11	
38)	i	1,4-Difluorobenzene(I	----------ISTD----------								
39)		Methyl Cyclohexane	0.456	0.249	0.338	0.374	0.378	0.371	0.359	16.14	
40)		Carbon Tetrachlorid	0.172	0.152	0.255	0.287	0.303	0.303	0.241	28.15	
41)		1,2-Dichloroethane	0.269	0.217	0.282	0.333	0.335	0.337	0.294	14.79	
42)	m	Benzene	1.038	0.870	1.093	1.282	1.303	1.312	1.147	14.22	
43)		Isobutyl Alcohol	0.019	0.016	0.022	0.025	0.024	0.024	0.022#	16.02	
44)	s	1,2-Dichloroethane-		0.126	0.263	0.287	0.299	0.285	0.240	31.60	
45)		1,2-Dichloroethane-		0.126	0.263	0.287	0.299	0.285	0.240	31.60	
46)	m	Trichloroethene	0.203	0.187	0.242	0.279	0.284	0.283	0.244	17.43	J/UJ
47)	*	1,2-Dichloropropane	0.265	0.226	0.302	0.357	0.353	0.362	0.311	16.08	J/UJ
48)		Methyl Methacrylate	0.059	0.054	0.080	0.087	0.082	0.086	0.073#	19.86	
49)		1,4-Dioxane	0.001	0.002	0.002	0.003	0.003	0.003	0.002#	20.91	
50)		Bromodichloromethan	0.280	0.241	0.337	0.386	0.396	0.409	0.343	17.78	
51)		Dibromomethane	0.168	0.138	0.183	0.221	0.219	0.226	0.191	17.03	
52)		4-Methyl-2-Pentanon	0.011	0.023	0.038	0.042	0.040	0.040	0.032#	34.83	
53)		2-Chloroethyl vinyl	0.049	0.074	0.119	0.140	0.149	0.154	0.113	35.54	
54)		2-Hexanone	0.193	0.138	0.205	0.223	0.224	0.222	0.198	16.48	
55)		C-1,3-Dichloroprope	0.389	0.339	0.455	0.559	0.559	0.576	0.474	20.00	
56)	s	D8-Toluene		0.464	0.918	1.139	1.116	1.045	0.893	33.85	
57)		D8-Toluene		0.464	0.918	1.139	1.116	1.045	0.893	33.85	
58)	i	Chlorobenzene-d5(IS)	----------ISTD----------								
59)	m*	Toluene	0.687	0.586	0.733	0.836	0.848	0.840	0.757	12.79	

60)		Ethyl Methacrylate	0.333	0.357	0.476	0.493	0.496	0.483	0.438	15.90
61)		T-1,3-Dichloroprope	0.357	0.309	0.413	0.478	0.486	0.485	0.420	16.88
62)		1,1,2-Trichloroetha	0.254	0.210	0.253	0.305	0.309	0.308	0.270	15.61
63)		1,3-Dichloropropane	0.530	0.418	0.533	0.621	0.621	0.623	0.551	14.75
64)		Tetrachloroethene	0.202	0.146	0.199	0.223	0.223	0.226	0.201	15.00
65)		Dibromochloromethan	0.239	0.203	0.275	0.323	0.331	0.338	0.284	18.17
66)		1,2-Dibromoethane	0.254	0.237	0.287	0.342	0.343	0.344	0.301	15.33
67)	**m	Chlorobenzene	0.746	0.554	0.726	0.828	0.832	0.843	0.750	14.08
68)		1,1,1,2-Tetrachloro	0.200	0.187	0.237	0.275	0.283	0.290	0.247	15.83
69)	*	Ethylbenzene	0.362	0.278	0.377	0.438	0.438	0.435	0.388	15.35
70)		m-xylene & p-xylene	0.442	0.353	0.458	0.514	0.527	0.517	0.468	13.56
71)		O-Xylene	0.418	0.345	0.452	0.519	0.528	0.538	0.464	15.65
72)	**	Bromoform	0.127	0.118	0.164	0.193	0.199	0.210	0.166	22.17
73)		Styrene	0.802	0.631	0.802	0.922	0.940	0.951	0.834	14.43
74)		Isopropylbenzene	0.988	0.747	1.027	1.177	1.231	1.249	1.071	16.85
75)		1,2,3-Trichloroprop	0.333	0.258	0.346	0.407	0.418	0.428	0.361	18.14
76)	**	1,1,2,2-Tetrachloro	0.340	0.271	0.331	0.392	0.394	0.394	0.351	13.83
77)	s	Bromofluorobenzene		0.184	0.381	0.477	0.471	0.454	0.380	33.00
78)		Bromofluorobenzene		0.184	0.381	0.477	0.471	0.454	0.380	33.00
79)		T-1,4-dichloro-2-bu	0.011	0.036	0.061	0.067	0.072	0.075	0.053#	44.67
80)		N-Propylbenzene	1.382	0.951	1.355	1.535	1.599	1.625	1.406	16.35
81)		Pentachloroethane	0.124	0.115	0.148	0.165	0.165	0.172	0.146	17.19
82)	i	1,4-Dichlorobenzene-d	----------ISTD----------							
83)		Bromobenzene	0.687	0.515	0.651	0.708	0.752	0.746	0.661	14.33
84)		1,3,5-Trimethylbenz	2.068	1.496	2.058	2.163	2.271	2.233	2.041	12.57
85)		2-Chlorotoluene	1.908	1.470	1.926	2.073	2.205	2.202	1.959	12.45
86)		4-Chlorotoluene	2.037	1.587	2.025	2.213	2.320	2.322	2.089	11.54
87)		1,2,4-Trimethylbenz	2.314	1.536	1.982	2.117	2.238	2.215	2.056	12.34
88)		s-Butylbenzene	2.738	1.727	2.357	2.492	2.655	2.652	2.416	13.86
89)		tert-Butylbenzene	1.646	1.176	1.555	1.592	1.690	1.677	1.530	12.87
90)		p-Isopropyltoluene	2.453	1.349	1.849	1.946	2.089	2.069	1.938	16.46
91)		1,3-Dichlorobenzene	1.341	0.889	1.094	1.193	1.279	1.303	1.177	12.65
92)		1,4-Dichlorobenzene	1.363	0.887	1.125	1.231	1.290	1.321	1.188	13.53
93)		1,2-Dichlorobenzene	1.228	0.805	0.996	1.136	1.216	1.222	1.086	14.71
94)		N-Butylbenzene	2.933	1.446	1.872	1.953	2.103	2.091	2.038	20.52
95)		DBCP	0.145	0.079	0.091	0.089	0.104	0.107	0.102	19.10
96)		Naphthalene	4.023	1.050	1.194	1.364	1.507	1.505	1.724	55.19
97)		1,2,4-Trichlorobenz	1.233	0.445	0.532	0.606	0.657	0.657	0.680	34.83
98)		Hexachlorobutadiene	0.418	0.112	0.152	0.161	0.185	0.192	0.196	47.46
99)		1,2,3-Trichlorobenz	1.236	0.389	0.423	0.494	0.548	0.546	0.601	44.78

(#) = Out of Range ### Number of calibration levels exceeded format ###

121814.M Fri Dec 19 05:48:00 2014

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260B

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Sequence: AA31856

Matrix: Water

Instrument: OVGCMS1

Calibration: 1412038

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA31856-CCV1)			Lab File ID: 1LQ003.D		Analyzed: 12/22/14 07:11			
Dibromofluoromethane	50.0	92	80 - 120	11.05	11.04625	0.0038	+/-0.5	
Toluene-d8	50.0	87	80 - 120	13.31	13.3075	0.0025	+/-0.5	
4-Bromofluorobenzene	50.0	93	80 - 120	15.85	15.845	0.0050	+/-0.5	
LCS (4L22056-BS1)			Lab File ID: 1LQ004.D		Analyzed: 12/22/14 07:42			
Dibromofluoromethane	50.0	115	72 - 131	11.05	11.04625	0.0038	+/-0.5	
Toluene-d8	50.0	100	89 - 112	13.31	13.3075	0.0025	+/-0.5	
4-Bromofluorobenzene	50.0	95	85 - 114	15.85	15.845	0.0050	+/-0.5	
Blank (4L22056-BLK1)			Lab File ID: 1LQ005.D		Analyzed: 12/22/14 08:10			
Dibromofluoromethane	50.0	129	72 - 131	11.05	11.04625	0.0038	+/-0.5	
Toluene-d8	50.0	116	89 - 112	13.31	13.3075	0.0025	+/-0.5	*
4-Bromofluorobenzene	50.0	128	85 - 114	15.85	15.845	0.0050	+/-0.5	*
IR06-SW09-14D (A407003-01)			Lab File ID: 1LQ015.D		Analyzed: 12/22/14 13:21			
Dibromofluoromethane	50.0	115	72 - 131	11.06	11.04625	0.0137	+/-0.5	
Toluene-d8	50.0	101	89 - 112	13.32	13.3075	0.0125	+/-0.5	
4-Bromofluorobenzene	50.0	107	85 - 114	15.85	15.845	0.0050	+/-0.5	
IR06-SW09D-14D (A407003-02)			Lab File ID: 1LQ016.D		Analyzed: 12/22/14 13:50			
Dibromofluoromethane	50.0	138	72 - 131	11.06	11.04625	0.0137	+/-0.5	*
Toluene-d8	50.0	120	89 - 112	13.32	13.3075	0.0125	+/-0.5	*
4-Bromofluorobenzene	50.0	132	85 - 114	15.86	15.845	0.0150	+/-0.5	*
IR06-SW11-14D (A407003-04)			Lab File ID: 1LQ017.D		Analyzed: 12/22/14 14:19			
Dibromofluoromethane	500	109	72 - 131	11.06	11.04625	0.0137	+/-0.5	
Toluene-d8	500	97	89 - 112	13.32	13.3075	0.0125	+/-0.5	
4-Bromofluorobenzene	500	103	85 - 114	15.86	15.845	0.0150	+/-0.5	
Matrix Spike (4L22056-MS1)			Lab File ID: 1LQ021.D		Analyzed: 12/22/14 16:14			
Dibromofluoromethane	500	102	72 - 131	11.06	11.04625	0.0137	+/-0.5	
Toluene-d8	500	89	89 - 112	13.32	13.3075	0.0125	+/-0.5	
4-Bromofluorobenzene	500	93	85 - 114	15.86	15.845	0.0150	+/-0.5	
Matrix Spike Dup (4L22056-MSD1)			Lab File ID: 1LQ022.D		Analyzed: 12/22/14 16:43			
Dibromofluoromethane	500	113	72 - 131	11.06	11.04625	0.0137	+/-0.5	
Toluene-d8	500	98	89 - 112	13.32	13.3075	0.0125	+/-0.5	
4-Bromofluorobenzene	500	101	85 - 114	15.86	15.845	0.0150	+/-0.5	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260B

Laboratory: ENCO Orlando

Client: CH2M Hill, Inc. (CH031)

SDG: A407003-CTO-WE9A

Project: CTO-WE9A Camp Lejeune Site 6

Sequence: AA31863

Matrix: Water

Instrument: OVGCMS2

Calibration: 1412083

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA31863-CCV1)			Lab File ID: 2LR002.D		Analyzed: 12/23/14 04:54			
Dibromofluoromethane	50.0	109	80 - 120	10.59	10.57	0.0200	+/-0.5	
Toluene-d8	50.0	106	80 - 120	12.85	12.83857	0.0114	+/-0.5	
4-Bromofluorobenzene	50.0	105	80 - 120	15.34	15.32857	0.0114	+/-0.5	
LCS (4L23033-BS1)			Lab File ID: 2LR004.D		Analyzed: 12/23/14 05:59			
Dibromofluoromethane	50.0	107	72 - 131	10.58	10.57	0.0100	+/-0.5	
Toluene-d8	50.0	106	89 - 112	12.85	12.83857	0.0114	+/-0.5	
4-Bromofluorobenzene	50.0	103	85 - 114	15.34	15.32857	0.0114	+/-0.5	
Blank (4L23033-BLK1)			Lab File ID: 2LR005.D		Analyzed: 12/23/14 06:29			
Dibromofluoromethane	50.0	110	72 - 131	10.58	10.57	0.0100	+/-0.5	
Toluene-d8	50.0	102	89 - 112	12.85	12.83857	0.0114	+/-0.5	
4-Bromofluorobenzene	50.0	100	85 - 114	15.34	15.32857	0.0114	+/-0.5	
IR06-TB-121014 (A407003-06)			Lab File ID: 2LR006.D		Analyzed: 12/23/14 06:59			
Dibromofluoromethane	50.0	108	72 - 131	10.59	10.57	0.0200	+/-0.5	
Toluene-d8	50.0	102	89 - 112	12.85	12.83857	0.0114	+/-0.5	
4-Bromofluorobenzene	50.0	100	85 - 114	15.34	15.32857	0.0114	+/-0.5	
IR06-EB-121014 (A407003-07)			Lab File ID: 2LR007.D		Analyzed: 12/23/14 07:29			
Dibromofluoromethane	50.0	108	72 - 131	10.58	10.57	0.0100	+/-0.5	
Toluene-d8	50.0	101	89 - 112	12.85	12.83857	0.0114	+/-0.5	
4-Bromofluorobenzene	50.0	100	85 - 114	15.34	15.32857	0.0114	+/-0.5	
IR06-SW09-14D (A407003-01RE1)			Lab File ID: 2LR008.D		Analyzed: 12/23/14 07:59			
Dibromofluoromethane	50.0	109	72 - 131	10.58	10.57	0.0100	+/-0.5	
Toluene-d8	50.0	104	89 - 112	12.85	12.83857	0.0114	+/-0.5	
4-Bromofluorobenzene	50.0	100	85 - 114	15.34	15.32857	0.0114	+/-0.5	
IR06-SW09D-14D (A407003-02RE1)			Lab File ID: 2LR009.D		Analyzed: 12/23/14 08:29			
Dibromofluoromethane	50.0	108	72 - 131	10.58	10.57	0.0100	+/-0.5	
Toluene-d8	50.0	102	89 - 112	12.86	12.83857	0.0214	+/-0.5	
4-Bromofluorobenzene	50.0	102	85 - 114	15.34	15.32857	0.0114	+/-0.5	
IR06-SW10-14D (A407003-03)			Lab File ID: 2LR010.D		Analyzed: 12/23/14 08:59			
Dibromofluoromethane	50.0	107	72 - 131	10.58	10.57	0.0100	+/-0.5	
Toluene-d8	50.0	102	89 - 112	12.85	12.83857	0.0114	+/-0.5	
4-Bromofluorobenzene	50.0	102	85 - 114	15.34	15.32857	0.0114	+/-0.5	

DataQual

VOA

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: IR06-SW09-14D
Duplicate Sample ID: IR06-SW09D-14D

Water: RPD>20%
Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
cis-1,2-dichloroethene	1	1	0
trichloroethene	0.95	0.91	4
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: Qualify all results with RPD >30% for soils and >20% for waters as estimated (J/UJ)

* one of the results below the LOD
if both results are below the LOD the results are not compared

Initial Calibration Date: 12/18/2014

RRF and %RSD Calculations:

Compound Name: vinyl chloride
Lab Value: 0.6950

Area of Compound	1282859
Area of Internal STD	461397
Conc. of Internal STD	50
Conc. of Compound	200
Calculated RRF	0.695

Compound Name: ethylbenzene
Lab Value: 15

RRF of STD 1	0.3620
RRF of STD 2	0.2780
RRF of STD 3	0.3770
RRF of STD 4	0.4380
RRF of STD 5	0.4380
RRF of STD 6	0.4350
RRF of STD 7	0.4960
RRF of STD 8	0.4360
Calculated % RSD	16

Continuing Calibration File ID: 12/23/2014

RRF and %D Calculations:

Compound Name: chloromethane
Lab Value: 0.716

Area of Compound	329737
Area of Internal STD	460256
Conc. of Internal STD	50
Conc. of Compound	50
Calculated RRF	0.716

Compound Name: 1,1,2,2,-tetrachloroethane
Lab Value: 5.6

Average RRF	0.351
Calibration Check RRF	0.371
Calculated % D	-5.7

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PROJECT NARRATIVE

Client: CH2M Hill, Inc.
Project: MCB Camp Lejeune Site 6, CTO-WE9A
Project Number: 938657
ENCO Project ID: A407003
SDG: A407003-CTOWE9A

Overview

All samples submitted were analyzed by Environmental Conservation Laboratories, Inc. in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling and processing will be discussed in the Remarks section below.

Remarks

List of instruments used:

Analytical and Preparation Method	SOP Reference Instrument
EPA 8260B	OVGCMS1, OVGCMS2

Analysis: EPA 8260B
Sequence: AA31614
Affected Sample(s): AA31614-CAL1, AA31614-CAL2, AA31614-CAL4
Nonconformance: Manual integrations
The following manual integrations were performed in the sample(s) AA31614-CAL1 due to incorrect peak selection/peak not found: Methyl Acetate, Methyl Methacrylate, 1,4-Dioxane, t-1,4-dichloro-2-butene, 1,4-Dichlorobenzene, DBCP.
The following manual integrations were performed in the sample(s) AA31614-CAL2 due to incorrect peak selection/peak not found: Methyl Acetate, 1,4-Dioxane, 4-Methyl-2-Pentanone, DBCP.
The following manual integrations were performed in the sample(s) AA31614-CAL4 due to incorrect peak selection/peak not found: 2-Chloroethyl vinyl ether, 2-Butanone.

Analysis: EPA 8260B
Sequence: AA31801
Affected Sample(s): AA31801-CAL1, AA31801-CAL 2, AA31801-CAL7, AA31801-CAL8
Nonconformance: Manual integrations
The following manual integrations were performed in the sample(s) AA31801-CAL1, AA31801-CAL2 due to incorrect peak selection/peak not found: 1,4-Dichlorobenzene.
The following manual integrations were performed in the sample(s) AA31801-CAL7, AA31801-CAL8 due to split peak: Isobutyl Alcohol.

Analysis: EPA 8260B
Affected Samples: IR06-SW09-14D [A407003-01], IR06-SW09-14D [A407003-01RE1], IR06-SW09D-14D [A407003-02], IR06-SW09D-14D [A407003-02RE1]
Due to suspected matrix interference the sample was initially analyzed at a dilution. The sample was re-analyzed at a lower dilution for confirmation. Both sets of data are reported.

Analysis: EPA 8260B
Affected Samples: IR06-SW09D-14D [A407003-02], IR06-SW09D-14D [A407003-02RE1]
The surrogate recoveries were outside acceptance limits for 4-Bromofluorobenzene, Dibromofluoromethane, and Toluene-d8. The sample was re-analyzed for confirmation. In the rerun the surrogate recoveries were within acceptable limits. Both sets of data are reported.

Analysis: EPA 8260B
Affected Samples: IR06-SW11-14D [A407003-04], 4L22056-MS1, 4L22056-MSD1
The spike recovery was outside the acceptance limits for 1,1,2-Trichloroethane, 1,1-Dichloroethene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Benzene, Chlorobenzene, Chloroform, cis-1,2-Dichloroethene, Ethylbenzene, Tetrachloroethene, trans-1,2-Dichloroethene, and Trichloroethene in the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

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PROJECT NARRATIVE

Analysis: EPA 8260B
Affected Samples: IR06-SW11-14D [A407003-04], IR06-SW11-14D [A407003-04RE1]
The sample was re-analyzed due to suspected carry-over effect. Both results are reported.

Analysis: EPA 8260B
Affected Samples: 4L22056-BLK1
The surrogate recoveries were outside acceptance limits for 4-Bromofluorobenzene and Toluene-d8.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy package and in computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures.

Digitally signed by Marcia Colon
Reason: I am the author of this document
Date: 2015.01.08 11:55:39 -05'00'

Marcia Colon
January 8, 2015
Project Manager

ENVIRONMENTAL CONSERVATION LABORATORIES **CHAIN-OF-CUSTODY RECORD**

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Client Name: CH2M Hill, Inc. (CH031)	Project Number: 938657
Address: 14120 Ballantyne Corporate Place, Suite 200	Project Name/Desc: CTO-WE9A Camp Lejeune Site 6
City/ST/Zip: Charlotte, NC 28277	PO # / Billing Info: 10006-7-100633
Tel: (704) 543-3274 Fax:	Reporting Contact: Blanca Kleist
Sampler(s) Name, Affiliation (Print): DAVID Seed	Billing Contact: Laurie George
Sampler(s) Signature:	Site Location / Time Zone: Site 6 / EASTERN

Requested Analyses: 8260B DOD Extended QSM 5.0

Requested Turnaround Times: Note: Rush requests subject to acceptance by the facility. PER SOW ___ Standard ___ Expedited Due __/__/__

Lab Workorder: A407003

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Preservation (See Codes / Combine as necessary)	Sample Comments
	IR06-SW09-14D	12-10-14	0835		SW	3	H X	
	IR06-SW09D-14D	↓	0840		↓	↓	X	
	IR06-SW10-14D		0855				X	
	IR06-SW11-14D		0900				X	
	IR06-SW11-14D-MS		0900				X	
	IR06-SW11-14D-SD		0900				X	
	IR06-SW12-14D		0915				X	
	IR06-TB-121014	↓	0920		↓ DI	↓ 2	X	
	IR06-EB-121014	12-10-14	0930		DI	3	X	bottles not labelled

<-- Total # of Containers

Sample Kit Prepared By: BNH	Date/Time: 11-25-14 1300	Relinquished By: Brandy Hall	Date/Time: 11-25-14 1300	Received By:	Date/Time:
Comments/Special Reporting Requirements:		Relinquished By:	Date/Time: 12/10/14 1700	Received By: R. Cell	Date/Time: 12/11/2014 0904
		Relinquished By:	Date/Time:	Received By:	Date/Time:
		Cooler #'s & Temps on Receipt: MED-118 0°C		Condition Upon Receipt: ✓ Acceptable ___ Unacceptable	

Matrix: GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments) Preservation: I-Ice H-HCl N-HNO3 S-H2SO4 NO-NaOH O-Other (detail in comments)

Note: All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist