ATTACHMENT 2: DATA VALIDATION REPORTS

This attachment contains the data validation reports performed by an independent subcontractor, Laboratory Data Consultants, Inc. (LDC), of Carlsbad, California.

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

Tidewater, Inc.
199 Shell Street
Manhattan Beach, CA 90266
ATTN: Mr. David Conner

September 9, 2015

SUBJECT: NASA JPL, 3Q2015, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on September 1, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #34928:

SDG #	Fraction
15-18771, 15-18669, 15-18879, 15-19097 15-19343, 15-19491	Volatiles, Chromium, Wet Chemistry

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

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Pei Geng
Project Manager/Senior Chemist

HC

Attachment 1

90/10 (client select) LDC #34928 (Tidewater- Manhattan Beach, CA / NASA JPL, 3Q2015)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)		Cr (200.8)		Cl,SO_4 NO_3-N (300.0)		NO_2-N (353.2)		O-PO_4 (365.1)		Cr(VI) (7196)		CLO_4 (314.0)																					
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
A	15-18771	09/01/15	09/23/15	7	0	7	0	-	-	-	-	-	-	7	0	6	0																				
B	15-18669	09/01/15	09/23/15	8	0	8	0	1	0	1	0	1	0	8	0	7	0																				
C	15-18879	09/01/15	09/23/15	8	0	6	0	-	-	-	-	-	-	6	0	7	0																				
C	15-18879	09/01/15	09/23/15	1	0	0	0	-	-	-	-	-	-	0	0	1	0																				
D	15-19097	09/01/15	09/23/15	9	0	7	0	-	-	-	-	-	-	7	0	8	0																				
D	15-19097	09/01/15	09/23/15	2	0	1	0	-	-	-	-	-	-	1	0	2	0																				
E	15-19343	09/01/15	09/23/15	9	0	8	0	1	0	1	0	1	0	8	0	8	0																				
E	15-19343	09/01/15	09/23/15	1	0	0	0	0	0	0	0	0	0	0	0	1	0																				
F	15-19491	09/01/15	09/23/15	11	0	5	0	1	0	1	0	1	0	5	0	9	0																				
F	15-19491	09/01/15	09/23/15	1	0	2	0	0	0	0	0	0	0	2	0	1	0																				
Total	T/PG			57	0	44	0	3	0	3	0	3	0	44	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	204

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

L:\Tidewater\NASA JPL\34928ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 8, 2015

Parameters: Volatiles

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18771

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-5-073115	1518771-01	Water	07/31/15
EB-5-073115	1518771-02	Water	07/31/15
MW-23-3	1518771-04	Water	07/31/15
MW-23-2	1518771-05	Water	07/31/15
MW-23-1	1518771-06	Water	07/31/15
MW-26-2	1518771-07	Water	07/31/15
MW-26-1	1518771-08	Water	07/31/15
MW-23-2MS	1518771-05MS	Water	07/31/15
MW-23-2MSD	1518771-05MSD	Water	07/31/15
MW-26-1MS	1518771-08MS	Water	07/31/15
MW-26-1MSD	1518771-08MSD	Water	07/31/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). 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) Method 524.2

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): 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.

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.

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

Instrument performance was checked 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.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% 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.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all 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 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/03/15	Bromomethane Methyl iodide	31.2 42.2	TB-5-073115 EB-5-073115 MW-23-3 MW-23-2 MW-23-1 MW-26-2	UJ (all non-detects) UJ (all non-detects)	P
08/04/15	Methyl iodide	49.5	MW-26-1	UJ (all non-detects)	P

V. Laboratory Blanks

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

VI. Field Blanks

Sample TB-5-073115 was identified as a trip blank. No contaminants were found.

Sample EB-5-073115 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) 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 continuing calibration %D, data were qualified as estimated 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.

NASA JPL, 3Q2015
Volatiles - Data Qualification Summary - SDG 15-18771

Sample	Compound	Flag	A or P	Reason
TB-5-073115 EB-5-073115 MW-23-3 MW-23-2 MW-23-1 MW-26-2	Bromomethane Methyl iodide	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)
MW-26-1	Methyl iodide	UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-18771

No Sample Data Qualified in this SDG

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-5-073115

Laboratory:	BC Laboratories		SDG:	15-18771	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518771-01	File ID:	03AUG21.D
Sampled:	07/31/15 06:10	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 13:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence: 1512296	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-5-073115

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-01	File ID:	03AUG21.D
Sampled:	07/31/15 06:10	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 13:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence:	1512296	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-5-073115

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-01	File ID:	03AUG21.D
Sampled:	07/31/15 06:10	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 13:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence:	1512296	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.290	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7000	97.0	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9400	99.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	201380	6.73	196176	6.73	
Chlorobenzene-d5 (IS)	69647	9.73	70664	9.72	
1,4-Difluorobenzene (IS)	280599	7.52	270212	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-5-073115

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-02	File ID:	03AUG22.D
Sampled:	07/31/15 06:30	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 13:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence:	1512296	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

8/7/15 X

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-5-073115

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-02	File ID:	03AUG22.D
Sampled:	07/31/15 06:30	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 13:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence:	1512296	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15 Y

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-5-073115

Laboratory:	BC Laboratories		SDG:	15-18771	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518771-02	File ID:	03AUG22.D
Sampled:	07/31/15 06:30	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 13:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence: 1512296	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U US
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.250	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6900	96.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.320	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	196942	6.73	196176	6.73	
Chlorobenzene-d5 (IS)	67980	9.72	70664	9.72	
1,4-Difluorobenzene (IS)	275151	7.52	270212	7.52	

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-3

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-04	File ID:	03AUG23.D
Sampled:	07/31/15 07:35	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 14:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence:	1512296	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.080	J
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-3

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-04	File ID:	03AUG23.D
Sampled:	07/31/15 07:35	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 14:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence:	1512296	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

8/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-3

Laboratory:	BC Laboratories		SDG:	15-18771	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518771-04	File ID:	03AUG23.D
Sampled:	07/31/15 07:35	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 14:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence: 1512296	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.420	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.050	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7100	97.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	185138	6.73	196176	6.73	
Chlorobenzene-d5 (IS)	65501	9.72	70664	9.72	
1,4-Difluorobenzene (IS)	256132	7.51	270212	7.52	

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-2

Laboratory:	BC Laboratories		SDG:	15-18771	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518771-05	File ID:	03AUG15.D
Sampled:	07/31/15 08:00	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 10:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence: 1512296	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.56	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.090	J
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.21	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-2

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-05	File ID:	03AUG15.D
Sampled:	07/31/15 08:00	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 10:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0016 Sequence: 1512296 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.54	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.9	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-2

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-05	File ID:	03AUG15.D
Sampled:	07/31/15 08:00	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 10:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence:	1512296	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9800	99.8	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6200	96.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.160	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191760	6.73	196176	6.73	
Chlorobenzene-d5 (IS)	61733	9.72	70664	9.72	
1,4-Difluorobenzene (IS)	262782	7.52	270212	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-1

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-06	File ID:	03AUG24.D
Sampled:	07/31/15 09:05	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 14:24
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence:	1512296	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.44	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.090	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-1

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-06	File ID:	03AUG24.D
Sampled:	07/31/15 09:05	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 14:24
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0016 Sequence: 1512296 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.24	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.8	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-1

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-06	File ID:	03AUG24.D
Sampled:	07/31/15 09:05	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 14:24
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence:	1512296	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.320	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7100	97.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.100	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194856	6.74	196176	6.73	
Chlorobenzene-d5 (IS)	65168	9.72	70664	9.72	
1,4-Difluorobenzene (IS)	266609	7.52	270212	7.52	

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-2

Laboratory:	BC Laboratories		SDG:	15-18771	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518771-07	File ID:	03AUG25.D
Sampled:	07/31/15 10:58	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 14:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence: 1512296	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.6	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.37	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-2

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-07	File ID:	03AUG25.D
Sampled:	07/31/15 10:58	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 14:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence:	1512296	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	3.4	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.40	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-2

Laboratory:	BC Laboratories		SDG:	15-18771	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518771-07	File ID:	03AUG25.D
Sampled:	07/31/15 10:58	Prepared:	08/03/15 07:00	Analyzed:	08/03/15 14:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0016	Sequence: 1512296	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.280	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9100	99.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9700	99.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	195278	6.73	196176	6.73	
Chlorobenzene-d5 (IS)	66286	9.73	70664	9.72	
1,4-Difluorobenzene (IS)	268481	7.52	270212	7.52	

9/7/15 [illegible]

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-1

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-08	File ID:	04AUG07.D
Sampled:	07/31/15 12:00	Prepared:	08/04/15 07:00	Analyzed:	08/04/15 07:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0146	Sequence:	1512396	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.29	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15 R

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-1

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-08	File ID:	04AUG07.D
Sampled:	07/31/15 12:00	Prepared:	08/04/15 07:00	Analyzed:	08/04/15 07:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0146	Sequence:	1512396	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.67	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.36	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:44:10AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-1

Laboratory:	BC Laboratories			SDG:	15-18771
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518771-08	File ID:	04AUG07.D
Sampled:	07/31/15 12:00	Prepared:	08/04/15 07:00	Analyzed:	08/04/15 07:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0146	Sequence:	1512396	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.320	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9200	99.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.530	105	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	196155	6.73	202060	6.73	
Chlorobenzene-d5 (IS)	64521	9.72	69406	9.72	
1,4-Difluorobenzene (IS)	267093	7.51	277418	7.51	

9/7/15

LDC #: 34928A1

SDG #: 15-18771

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/4/15

Page: 1 of 2

Reviewer: KM

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

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 ≤ 20?, r2 ICV ≤ 30?
IV.	Continuing calibration	SW	CCV ≤ 30?
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 EB = 2
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	~~A~~ N	
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	TB-5-073115	1518771-01	Water	07/31/15
2	EB-5-073115	1518771-02	Water	07/31/15
3	MW-23-3	1518771-04	Water	07/31/15
4	MW-23-2	1518771-05	Water	07/31/15
5	MW-23-1	1518771-06	Water	07/31/15
6	MW-26-2	1518771-07	Water	07/31/15
7 2	MW-26-1	1518771-08	Water	07/31/15
8	MW-23-2MS	1518771-05MS	Water	07/31/15
9	MW-23-2MSD	1518771-05MSD	Water	07/31/15
10 2	MW-26-1MS	1518771-08MS	Water	07/31/15
11 2	MW-26-1MSD	1518771-08MSD	Water	07/31/15
12				
13				

LDC #: 34928A1

SDG #: 15-18771

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/4/15

Reviewer: BV

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				

Notes:

1	BY140016-BLK1						
2	BY140146-BLK1						

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. Methyl iodide
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. Pentachloroethane
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 #: 34928A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: BR
2nd Reviewer: CL

METHOD: GC/MS VOA (EPA Method 524.2)
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 all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0%)	Associated Samples	Qualifications
	8/3/15	CCV-03AUG03	B	31.2	1-6, 8-9 +	J/UJ/P (ND)
			W1	42.2	BYH0016-BLK1	V
	8/4/15	CCV-04AUG04	W1	49.5	7, 10-11 + BYH0146-BLK1	J/UJ/P (ND)

CONCAL.1S5

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 3, 2015

Parameters: Chromium

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18771

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-5-073115	1518771-02	Water	07/31/15
MW-23-4	1518771-03	Water	07/31/15
MW-23-3	1518771-04	Water	07/31/15
MW-23-2	1518771-05	Water	07/31/15
MW-23-1	1518771-06	Water	07/31/15
MW-26-2	1518771-07	Water	07/31/15
MW-26-1	1518771-08	Water	07/31/15
MW-26-1MS	1518771-08MS	Water	07/31/15
MW-26-1MSD	1518771-08MSD	Water	07/31/15
MW-26-1DUP	1518771-08DUP	Water	07/31/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Chromium by Environmental Protection Agency (EPA) Method 200.8

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): 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.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected 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 or analyte 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.

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 method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

ICP interference check sample analyses were not required by the method.

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	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium	1.1650 ug/L	All samples in SDG 15-18771

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 (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-23-4	Chromium	3.2 ug/L	3.2U ug/L
MW-23-2	Chromium	2.8 ug/L	2.8U ug/L
MW-23-1	Chromium	1.7 ug/L	1.7U ug/L
MW-26-2	Chromium	2.0 ug/L	2.0U ug/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-26-1	Chromium	1.3 ug/L	1.3U ug/L

VI. Field Blanks

Sample EB-5-073115 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
EB-5-073115	Chromium	58

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. Duplicate Sample Analysis

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

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

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Raw data were not reviewed for Level III validation.

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 method. No results were rejected in this SDG.

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

NASA JPL, 3Q2015
Chromium - Data Qualification Summary - SDG 15-18771

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-18771

Sample	Analyte	Modified Final Concentration	A or P
MW-23-4	Chromium	3.2U ug/L	A
MW-23-2	Chromium	2.8U ug/L	A
MW-23-1	Chromium	1.7U ug/L	A
MW-26-2	Chromium	2.0U ug/L	A
MW-26-1	Chromium	1.3U ug/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:46:09AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-5-073115

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-02
File ID: PE_EL2_150808-060
Sampled: 07/31/15 06:30
Prepared: 08/04/15 09:35
Analyzed: 08/08/15 14:13
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0196
Sequence: 1512854
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	58	1		EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:46:09AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-23-4

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-03
File ID: PE_EL2_150808-061
Sampled: 07/31/15 07:00
Prepared: 08/04/15 09:35
Analyzed: 08/08/15 14:16
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0196
Sequence: 1512854
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.2	1	U	EPA-200.8

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:46:09AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-23-3

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-04
File ID: PE_EL2_150808-062
Sampled: 07/31/15 07:35
Prepared: 08/04/15 09:35
Analyzed: 08/08/15 14:20
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0196
Sequence: 1512854
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	6.6	1	Ka	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:46:09AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-23-2

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-05
File ID: PE_EL2_150808-063
Sampled: 07/31/15 08:00
Prepared: 08/04/15 09:35
Analyzed: 08/08/15 14:23
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0196
Sequence: 1512854
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.8	1	J U	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:46:09AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-23-1

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-06
File ID: PE_EL2_150808-064
Sampled: 07/31/15 09:05
Prepared: 08/04/15 09:35
Analyzed: 08/08/15 14:27
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0196
Sequence: 1512854
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.7	1	J U	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:46:09AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-26-2

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-07
File ID: PE_EL2_150808-065
Sampled: 07/31/15 10:58
Prepared: 08/04/15 09:35
Analyzed: 08/08/15 14:30
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0196
Sequence: 1512854
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.0	1	J U	EPA-200.8

9/7/15 9

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:46:09AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-26-1

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-08
File ID: PE_EL2_150808-049
Sampled: 07/31/15 12:00
Prepared: 08/04/15 09:35
Analyzed: 08/08/15 13:35
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0196
Sequence: 1512854
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.3	1	J U	EPA-200.8

9/7/15

LDC #: 34928A4a

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/1/15

SDG #: 15-18771

Page: 1 of 1

Laboratory: BC Laboratories, Inc.

Reviewer: JO

2nd Reviewer: [illegible]

METHOD: Chromium (EPA Method 200.8)

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	7/31/15
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not Required
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB=(1)
VII.	Matrix Spike/Matrix Spike Duplicates	A	MSD=(8,9)
VIII.	Duplicate sample analysis	A	DUP
IX.	ICP Serial Dilution	A	
X.	Laboratory control samples	A	LCS
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	EB-5-073115	1518771-02	Water	07/31/15
2	MW-23-4	1518771-03	Water	07/31/15
3	MW-23-3	1518771-04	Water	07/31/15
4	MW-23-2	1518771-05	Water	07/31/15
5	MW-23-1	1518771-06	Water	07/31/15
6	MW-26-2	1518771-07	Water	07/31/15
7	MW-26-1	1518771-08	Water	07/31/15
8	MW-26-1MS	1518771-08MS	Water	07/31/15
9	MW-26-1MSD	1518771-08MSD	Water	07/31/15
10	MW-26-1DUP	1518771-08DUP	Water	07/31/15
11				
12				
13				
14				

Notes:

FB = 58 ug/L

LDC #: 34928A4a

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: JD
2nd Reviewer: 9

METHOD: Metals (EPA SW 864 Method 6010/6020/7000) Soil preparation factor applied: ____
Sample Concentration units, unless otherwise noted: ug/L Associated Samples: All

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	2	4	5	6	7					
Cr		1.1650		5.825	3.2	2.8	1.7	2.0	1.3					

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 #: 34928A4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?

Sample: 1 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

Analyte	Concentration Units (ug/l)
Cr	58

Sample: _____ Field Blank / Trip Blank / Rinsate / Other_____ (circle one)

Analyte	Concentration Units ( )

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 3, 2015

Parameters: Wet Chemistry

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18771

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-5-073115	1518771-02	Water	07/31/15
MW-23-4	1518771-03	Water	07/31/15
MW-23-3	1518771-04	Water	07/31/15
MW-23-2	1518771-05	Water	07/31/15
MW-23-1	1518771-06	Water	07/31/15
MW-26-2	1518771-07	Water	07/31/15
MW-26-1	1518771-08	Water	07/31/15
MW-23-2MS	1518771-05MS	Water	07/31/15
MW-23-2MSD	1518771-05MSD	Water	07/31/15
MW-23-2DUP	1518771-05DUP	Water	07/31/15
MW-26-2MS	1518771-07MS	Water	07/31/15
MW-26-2MSD	1518771-07MSD	Water	07/31/15
MW-26-2DUP	1518771-07DUP	Water	07/31/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7196
Perchlorate by EPA Method 314.0

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): 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.

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.

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

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

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

V. Field Blanks

Sample EB-5-073115 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. Duplicates

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 methods. Percent recoveries (%R) 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 methods. 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.

NASA JPL, 3Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-18771

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-18771

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

EB-5-073115

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-02
File ID: F081515A.seq-31.0000.txt
Sampled: 07/31/15 06:30
Prepared: 08/15/15 22:00
Analyzed: 08/15/15 23:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1359
Sequence: 1513265
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-23-3

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-04
File ID: F081515A.seq-32.0000.txt
Sampled: 07/31/15 07:35
Prepared: 08/15/15 22:00
Analyzed: 08/16/15 00:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1359
Sequence: 1513265
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.6	1	J	EPA-314.0

8/27/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-23-2

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-05
File ID: F081515A.seq-25.0000.txt
Sampled: 07/31/15 08:00
Prepared: 08/15/15 22:00
Analyzed: 08/15/15 22:31
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1359
Sequence: 1513265
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	5.8	1		EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-23-1

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-06
File ID: F081515A.seq-33.0000.txt
Sampled: 07/31/15 09:05
Prepared: 08/15/15 22:00
Analyzed: 08/16/15 00:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1359
Sequence: 1513265
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.7	1	J	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-26-2

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-07
File ID: F081515.seq-8.0000.txt
Sampled: 07/31/15 10:58
Prepared: 08/15/15 01:00
Analyzed: 08/15/15 03:03
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1356
Sequence: 1513279
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.2	1	J	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-26-1

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-08RE1
File ID: F081515.seq-43.0000.txt
Sampled: 07/31/15 12:00
Prepared: 08/15/15 01:00
Analyzed: 08/15/15 13:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1356
Sequence: 1513279
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.5	1	J	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-5-073115

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-02
File ID: 150731 2053 CR6-071
Sampled: 07/31/15 06:30
Prepared: 08/01/15 00:44
Analyzed: 08/01/15 00:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0087
Sequence: 1512351
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-4

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-03
File ID: 150731 2053 CR6-072
Sampled: 07/31/15 07:00
Prepared: 08/01/15 00:44
Analyzed: 08/01/15 00:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0087
Sequence: 1512351
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0019	1	J	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-3

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-04
File ID: 150731 2053 CR6-073
Sampled: 07/31/15 07:35
Prepared: 08/01/15 00:44
Analyzed: 08/01/15 00:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0087
Sequence: 1512351
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0027	1		EPA-7196

9/7/15 [illegible]

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-2

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-05
File ID: 150731 2053 CR6-067
Sampled: 07/31/15 08:00
Prepared: 08/01/15 00:44
Analyzed: 08/01/15 00:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0087
Sequence: 1512351
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00090	1	J	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-1

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-06
File ID: 150731 2053 CR6-074
Sampled: 07/31/15 09:05
Prepared: 08/01/15 00:44
Analyzed: 08/01/15 00:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0087
Sequence: 1512351
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15 J

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-26-2

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-07
File ID: 150731 2053 CR6-077
Sampled: 07/31/15 10:58
Prepared: 08/01/15 00:44
Analyzed: 08/01/15 00:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0087
Sequence: 1512351
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0011	1	J	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:45:12AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-26-1

Laboratory: BC Laboratories
SDG: 15-18771
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518771-08
File ID: 150731 2053 CR6-078
Sampled: 07/31/15 12:00
Prepared: 08/01/15 00:44
Analyzed: 08/01/15 00:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0087
Sequence: 1512351
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

LDC #: 34928A6

SDG #: 15-18771

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/1/15

Page: 1 of 1

Reviewer: JD

2nd Reviewer: [illegible]

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0)

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	7/31/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	EB=(1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(8,9) (11,12)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
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	EB-5-073115	ClO4	1518771-02	Water	07/31/15
2	MW-23-4		1518771-03	Water	07/31/15
3	MW-23-3	ClO4	1518771-04	Water	07/31/15
4	MW-23-2		1518771-05	Water	07/31/15
5	MW-23-1		1518771-06	Water	07/31/15
6	MW-26-2		1518771-07	Water	07/31/15
7	MW-26-1		1518771-08	Water	07/31/15
8	MW-23-2MS	Cr+6 ClO4	1518771-05MS	Water	07/31/15
9	MW-23-2MSD		1518771-05MSD	Water	07/31/15
10	MW-23-2DUP	Cr+6	1518771-05DUP	Water	07/31/15
11	MW-26-2MS		1518771-07MS	Water	07/31/15
12	MW-26-2MSD		1518771-07MSD	Water	07/31/15
13	MW-26-2DUP		1518771-07DUP	Water	07/31/15
14					
15					
16					

Notes:

LDC #: 34928A0

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Parameter
1, 3-7	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
2	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 8-10	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 11-13	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 8, 2015

Parameters: Volatiles

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18669

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-4-073015	1518669-01	Water	07/30/15
EB-4-073015	1518669-02	Water	07/30/15
MW-22-3	1518669-03	Water	07/30/15
MW-22-2	1518669-04	Water	07/30/15
MW-22-1	1518669-05	Water	07/30/15
MW-24-3	1518669-07	Water	07/30/15
MW-24-2	1518669-08	Water	07/30/15
MW-24-1	1518669-09	Water	07/30/15
MW-22-3MS	1518669-03MS	Water	07/30/15
MW-22-3MSD	1518669-03MSD	Water	07/30/15
MW-24-2MS	1518669-08MS	Water	07/30/15
MW-24-2MSD	1518669-08MSD	Water	07/30/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). 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) Method 524.2

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): 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.

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.

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

Instrument performance was checked 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.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% 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.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all 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 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/01/15	Bromomethane 2,2-Dichloropropane Methyl iodide Pentachloroethane	61.3 34.5 45.8 46.9	TB-4-073015 EB-4-073015 MW-22-3 MW-22-2 MW-22-1 MW-24-3 MW-24-1	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
08/02/15	Bromomethane Methyl iodide	60.5 50.6	MW-24-2	UJ (all non-detects)	P

V. Laboratory Blanks

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

VI. Field Blanks

Sample TB-4-073015 was identified as a trip blank. No contaminants were found.

Sample EB-4-073015 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) 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 continuing calibration %D, data were qualified as estimated in eight 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.

NASA JPL, 3Q2015
Volatiles - Data Qualification Summary - SDG 15-18669

Sample	Compound	Flag	A or P	Reason
TB-4-073015 EB-4-073015 MW-22-3 MW-22-2 MW-22-1 MW-24-3 MW-24-1	Bromomethane 2,2-Dichloropropane Methyl iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)
MW-24-2	Bromomethane Methyl iodide	UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-18669

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-4-073015

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-01	File ID:	31JUL86.D
Sampled:	07/30/15 06:00	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 13:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence:	1512214	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

8/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-4-073015

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-01	File ID:	31JUL86.D
Sampled:	07/30/15 06:00	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 13:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-4-073015

Laboratory:	BC Laboratories		SDG:	15-18669	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518669-01	File ID:	31JUL86.D
Sampled:	07/30/15 06:00	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 13:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.280	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7500	97.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.140	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	186368	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	65270	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	262273	7.52	262686	7.52	

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-4-073015

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-02	File ID:	31JUL87.D
Sampled:	07/30/15 06:40	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 13:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence:	1512214	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-4-073015

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-02	File ID:	31JUL87.D
Sampled:	07/30/15 06:40	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 13:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2654 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-4-073015

Laboratory:	BC Laboratories		SDG:	15-18669	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518669-02		File ID:	31JUL87.D
Sampled:	07/30/15 06:40	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 13:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.290	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8700	98.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7200	97.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190609	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	67638	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	261920	7.52	262686	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-3

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-03	File ID:	31JUL69.D
Sampled:	07/30/15 07:40	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 06:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence:	1512214	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-3

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-03	File ID:	31JUL69.D
Sampled:	07/30/15 07:40	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 06:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2654 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-3

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-03	File ID:	31JUL69.D
Sampled:	07/30/15 07:40	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 06:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence:	1512214	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.370	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.020	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7600	97.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	184073	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	64525	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	251607	7.52	262686	7.52	

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-2

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-04	File ID:	31JUL88.D
Sampled:	07/30/15 08:45	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 14:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2654 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-2

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-04	File ID:	31JUL88.D
Sampled:	07/30/15 08:45	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 14:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2654 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-2

Laboratory:	BC Laboratories		SDG:	15-18669	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518669-04	File ID:	31JUL88.D
Sampled:	07/30/15 08:45	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 14:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2654 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.8900	98.9	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7900	97.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9700	99.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	185956	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	62566	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	256677	7.52	262686	7.52	

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-1

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-05	File ID:	31JUL89.D
Sampled:	07/30/15 09:20	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 14:27
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence:	1512214	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.37	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-1

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-05	File ID:	31JUL89.D
Sampled:	07/30/15 09:20	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 14:27
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2654 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.22	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.2	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-1

Laboratory:	BC Laboratories		SDG:	15-18669	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518669-05		File ID:	31JUL89.D
Sampled:	07/30/15 09:20	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 14:27
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.330	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8300	98.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.240	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191220	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	63234	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	260876	7.52	262686	7.52	

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-3

Laboratory:	BC Laboratories		SDG:	15-18669	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518669-07		File ID:	31JUL90.D
Sampled:	07/30/15 11:15	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 14:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-3

Laboratory:	BC Laboratories		SDG:	15-18669	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518669-07	File ID:	31JUL90.D
Sampled:	07/30/15 11:15	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 14:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.090	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-3

Laboratory:	BC Laboratories		SDG:	15-18669	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518669-07		File ID:	31JUL90.D
Sampled:	07/30/15 11:15	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 14:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9100	99.1	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9700	99.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.170	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190948	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	62460	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	252803	7.52	262686	7.52	

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-2

Laboratory:	BC Laboratories		SDG:	15-18669	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518669-08	File ID:	02AUG07.D
Sampled:	07/30/15 11:50	Prepared:	08/02/15 07:00	Analyzed:	08/02/15 07:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0011	Sequence: 1512295	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.30	J
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.36	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-2

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-08	File ID:	02AUG07.D
Sampled:	07/30/15 11:50	Prepared:	08/02/15 07:00	Analyzed:	08/02/15 07:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0011 Sequence: 1512295 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.14	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-2

Laboratory:	BC Laboratories		SDG:	15-18669	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518669-08		File ID:	02AUG07.D
Sampled:	07/30/15 11:50	Prepared:	08/02/15 07:00	Analyzed:	08/02/15 07:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0011	Sequence: 1512295	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U VS
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.270	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8500	98.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.360	104	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	188351	6.74	191284	6.73	
Chlorobenzene-d5 (IS)	64466	9.72	66313	9.72	
1,4-Difluorobenzene (IS)	263254	7.52	274977	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-1

Laboratory:	BC Laboratories		SDG:	15-18669	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518669-09	File ID:	31JUL91.D
Sampled:	07/30/15 12:50	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 15:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2654 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	2.3	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-1

Laboratory:	BC Laboratories			SDG:	15-18669
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518669-09	File ID:	31JUL91.D
Sampled:	07/30/15 12:50	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 15:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:40:29AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-1

Laboratory:	BC Laboratories		SDG:	15-18669	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518669-09	File ID:	31JUL91.D
Sampled:	07/30/15 12:50	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 15:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.200	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.180	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7500	97.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	188854	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	64489	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	252606	7.51	262686	7.52	

9/7/15

LDC #: 34928B1 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/4/15

SDG #: 15-18669 Level III Page: 1 of 2

Laboratory: BC Laboratories, Inc. Reviewer: KR

2nd Reviewer: Q

METHOD: GC/MS Volatiles (EPA Method 524.2)

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 ≤ 20 2, r2 ICV ≤ 30%
IV.	Continuing calibration	SW	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 EB = 2
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A ~~N~~	
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	TB-4-073015	1518669-01	Water	07/30/15
2	EB-4-073015	1518669-02	Water	07/30/15
3	MW-22-3	1518669-03	Water	07/30/15
4	MW-22-2	1518669-04	Water	07/30/15
5	MW-22-1	1518669-05	Water	07/30/15
6	MW-24-3	1518669-07	Water	07/30/15
7 2	MW-24-2	1518669-08	Water	07/30/15
8	MW-24-1	1518669-09	Water	07/30/15
9	MW-22-3MS	1518669-03MS	Water	07/30/15
10	MW-22-3MSD	1518669-03MSD	Water	07/30/15
11 2	MW-24-2MS	1518669-08MS	Water	07/30/15
12 2	MW-24-2MSD	1518669-08MSD	Water	07/30/15
13				

LDC #: 34928B1

SDG #: 15-18669

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/4/15

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				
17				

Notes:

1	BYG2654-BLK1						
2	BYH0011-BLK1						

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. Methyl iodide
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. Pentachloroethane
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 #: 34928B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: BM
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)
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 all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	8/1/15	CCV - 31JUL65/66	B	61.3	1-6, 8-10	J/UJ/P (ND)
			DD	34.5	+ BYG2654-BLK1	↓
			W1	45.8		
			X1	46.9		
	8/2/15	CCV - 02AUG03	B	60.5	7, 11-12 +	J/UJ/P (ND)
			W1	50.6	BYH0011-BLK1	↓

CONCAL.1S5

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 3, 2015

Parameters: Chromium

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18669

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-4-073015	1518669-02	Water	07/30/15
MW-22-3	1518669-03	Water	07/30/15
MW-22-2	1518669-04	Water	07/30/15
MW-22-1	1518669-05	Water	07/30/15
MW-24-4	1518669-06	Water	07/30/15
MW-24-3	1518669-07	Water	07/30/15
MW-24-2	1518669-08	Water	07/30/15
MW-24-1	1518669-09	Water	07/30/15
EB-4-073015MS	1518669-02MS	Water	07/30/15
EB-4-073015MSD	1518669-02MSD	Water	07/30/15
EB-4-073015DUP	1518669-02DUP	Water	07/30/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Chromium by Environmental Protection Agency (EPA) Method 200.8

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): 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.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected 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 or analyte 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.

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 method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

ICP interference check sample analyses were not required by the method.

V. Laboratory Blanks

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

VI. Field Blanks

Sample EB-4-073015 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. Duplicate Sample Analysis

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

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

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Raw data were not reviewed for Level III validation.

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 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.

NASA JPL, 3Q2015
Chromium - Data Qualification Summary - SDG 15-18669

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-18669

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:43:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

EB-4-073015

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-02
File ID: PE_EL2_150803-244
Sampled: 07/30/15 06:40
Prepared: 08/03/15 09:45
Analyzed: 08/04/15 00:54
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0080
Sequence: 1512488
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:43:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-22-3

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-03
File ID: PE_EL2_150803-258
Sampled: 07/30/15 07:40
Prepared: 08/03/15 09:45
Analyzed: 08/04/15 01:43
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0080
Sequence: 1512488
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.9	1	J	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:43:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-22-2

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-04
File ID: PE_EL2_150803-259
Sampled: 07/30/15 08:45
Prepared: 08/03/15 09:45
Analyzed: 08/04/15 01:46
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0080
Sequence: 1512488
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.6	1	J	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:43:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-22-1

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-05
File ID: PE_EL2_150803-260
Sampled: 07/30/15 09:20
Prepared: 08/03/15 09:45
Analyzed: 08/04/15 01:50
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0080
Sequence: 1512488
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:43:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-24-4

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-06
File ID: PE_EL2_150803-261
Sampled: 07/30/15 10:40
Prepared: 08/03/15 09:45
Analyzed: 08/04/15 01:53
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0080
Sequence: 1512488
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:43:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-24-3

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-07
File ID: PE_EL2_150803-264
Sampled: 07/30/15 11:15
Prepared: 08/03/15 09:45
Analyzed: 08/04/15 02:04
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0080
Sequence: 1512488
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

8/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:43:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-24-2

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-08
File ID: PE_EL2_150803-265
Sampled: 07/30/15 11:50
Prepared: 08/03/15 09:45
Analyzed: 08/04/15 02:07
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0080
Sequence: 1512488
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.8	1	J	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 9:43:06AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-24-1

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-09
File ID: PE_EL2_150803-266
Sampled: 07/30/15 12:50
Prepared: 08/03/15 09:45
Analyzed: 08/04/15 02:11
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0080
Sequence: 1512488
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.2	1	J	EPA-200.8

9/7/15 T

LDC #: 34928B4a

SDG #: 15-18669

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/1/15

Page: 1 of 1

Reviewer: JD

2nd Reviewer: [illegible]

METHOD: Chromium (EPA Method 200.8)

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	7/30/15
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not Required
V.	Laboratory Blanks	A	
VI.	Field Blanks	ND	EB= (1)
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/D =(9,10)
VIII.	Duplicate sample analysis	A	DUP
IX.	ICP Serial Dilution	A	
X.	Laboratory control samples	A	LCS
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	EB-4-073015	1518669-02	Water	07/30/15
2	MW-22-3	1518669-03	Water	07/30/15
3	MW-22-2	1518669-04	Water	07/30/15
4	MW-22-1	1518669-05	Water	07/30/15
5	MW-24-4	1518669-06	Water	07/30/15
6	MW-24-3	1518669-07	Water	07/30/15
7	MW-24-2	1518669-08	Water	07/30/15
8	MW-24-1	1518669-09	Water	07/30/15
9	EB-4-073015MS	1518669-02MS	Water	07/30/15
10	EB-4-073015MSD	1518669-02MSD	Water	07/30/15
11	EB-4-073015DUP	1518669-02DUP	Water	07/30/15
12				
13				
14				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 3, 2015

Parameters: Wet Chemistry

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18669

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-4-073015	1518669-02	Water	07/30/15
MW-22-3	1518669-03	Water	07/30/15
MW-22-2	1518669-04	Water	07/30/15
MW-22-1	1518669-05	Water	07/30/15
MW-24-4	1518669-06	Water	07/30/15
MW-24-3	1518669-07	Water	07/30/15
MW-24-2	1518669-08	Water	07/30/15
MW-24-1	1518669-09	Water	07/30/15
MW-22-3MS	1518669-03MS	Water	07/30/15
MW-22-3MSD	1518669-03MSD	Water	07/30/15
MW-22-3DUP	1518669-03DUP	Water	07/30/15
MW-24-2MS	1518669-08MS	Water	07/30/15
MW-24-2MSD	1518669-08MSD	Water	07/30/15
MW-24-2DUP	1518669-08DUP	Water	07/30/15
MW-24-1MS	1518669-09MS	Water	07/30/15
MW-24-1MSD	1518669-09MSD	Water	07/30/15
MW-24-1DUP	1518669-09DUP	Water	07/30/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA SW 846 Method 7196
Nitrite as Nitrogen by EPA Method 353.2
Orthophosphate as Phosphorus by EPA Method 365.1
Perchlorate by EPA Method 314.0

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): 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.

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.

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

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

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

V. Field Blanks

Sample EB-4-073015 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. Duplicates

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 methods. Percent recoveries (%R) 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 methods. 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.

NASA JPL, 3Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-18669

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-18669

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-300.0

MW-24-1

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-09
File ID: E073015A.seq-34
Sampled: 07/30/15 12:50
Prepared: 07/31/15 01:00
Analyzed: 07/31/15 07:01
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2664
Sequence: 1512642
Calibration: UNASSIGNED
Instrument: IC5

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	91	1		EPA-300.0
14797-55-8	Nitrate as N	1.3	1		EPA-300.0
14808-79-8	Sulfate	57	1		EPA-300.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-24-1

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-09
File ID: 150731 0827 NO2-005
Sampled: 07/30/15 12:50
Prepared: 07/31/15 08:27
Analyzed: 07/31/15 08:27
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0071
Sequence: 1512346
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.012	1	U	EPA-353.2

8/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-365.1

MW-24-1

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-09
File ID: 150731 0857 PO4-024
Sampled: 07/30/15 12:50
Prepared: 07/31/15 08:57
Analyzed: 07/31/15 08:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0075
Sequence: 1512348
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.017	1	U	EPA-365.1

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-4-073015

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-02
File ID: F081415.seq-10.0000.txt
Sampled: 07/30/15 06:40
Prepared: 08/14/15 04:00
Analyzed: 08/14/15 06:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1230
Sequence: 1513181
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-22-3

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-03
File ID: F081415.seq-11.0000.txt
Sampled: 07/30/15 07:40
Prepared: 08/14/15 04:00
Analyzed: 08/14/15 07:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1230
Sequence: 1513181
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	J	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-22-2

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-04
File ID: F081415.seq-15.0000.txt
Sampled: 07/30/15 08:45
Prepared: 08/14/15 04:00
Analyzed: 08/14/15 08:09
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1230
Sequence: 1513181
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.2	1	J	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-22-1

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-05
File ID: F081415.seq-19.0000.txt
Sampled: 07/30/15 09:20
Prepared: 08/14/15 04:00
Analyzed: 08/14/15 09:07
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1230
Sequence: 1513181
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.8	1	J	EPA-314.0

8/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-24-3

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-07
File ID: F081415.seq-20.0000.txt
Sampled: 07/30/15 11:15
Prepared: 08/14/15 04:00
Analyzed: 08/14/15 09:21
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1230
Sequence: 1513181
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

8/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-24-2

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-08
File ID: F081415.seq-30.0000.txt
Sampled: 07/30/15 11:50
Prepared: 08/14/15 04:00
Analyzed: 08/14/15 11:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1255
Sequence: 1513181
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.7	1	J	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-24-1

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-09RE1
File ID: F081415.seq-37.0000.txt
Sampled: 07/30/15 12:50
Prepared: 08/14/15 04:00
Analyzed: 08/14/15 13:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1255
Sequence: 1513181
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	24	2	D	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-4-073015

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-02
File ID: 150730 2128 CR6-019
Sampled: 07/30/15 06:40
Prepared: 07/30/15 21:28
Analyzed: 07/30/15 21:29
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2753
Sequence: 1512435
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-22-3

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-03
File ID: 150730 2128 CR6-015
Sampled: 07/30/15 07:40
Prepared: 07/30/15 21:28
Analyzed: 07/30/15 21:28
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2753
Sequence: 1512435
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0018	1	J	EPA-7196

9/7/15 [illegible]

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-22-2

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-04
File ID: 150730 2128 CR6-020
Sampled: 07/30/15 08:45
Prepared: 07/30/15 21:28
Analyzed: 07/30/15 21:29
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2753
Sequence: 1512435
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014	1	J	EPA-7196

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-22-1

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-05
File ID: 150730 2128 CR6-034
Sampled: 07/30/15 09:20
Prepared: 07/30/15 21:28
Analyzed: 07/30/15 23:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2753
Sequence: 1512435
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

8/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-4

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-06
File ID: 150730 2128 CR6-022
Sampled: 07/30/15 10:40
Prepared: 07/30/15 21:28
Analyzed: 07/30/15 21:29
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2753
Sequence: 1512435
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0011	1	J	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-24-3

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-07
File ID: 150730 2128 CR6-025
Sampled: 07/30/15 11:15
Prepared: 07/30/15 21:28
Analyzed: 07/30/15 21:34
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2753
Sequence: 1512435
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-2

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-08
File ID: 150730 2128 CR6-035
Sampled: 07/30/15 11:50
Prepared: 07/30/15 23:14
Analyzed: 07/30/15 23:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2754
Sequence: 1512435
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0018	1	J	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 10:42:32AM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-24-1

Laboratory: BC Laboratories
SDG: 15-18669
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518669-09
File ID: 150730 2128 CR6-027
Sampled: 07/30/15 12:50
Prepared: 07/30/15 21:28
Analyzed: 07/30/15 21:35
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2753
Sequence: 1512435
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

LDC #: 34928B6

SDG #: 15-18669

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/1/15

Page: 1 of 1

Reviewer: JD

2nd Reviewer: [illegible]

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Hexavalent Chromium (EPA SW846 Method 7196), Nitrite-N (EPA Method 353.2), ortho-Phosphate (EPA Method 365.1), Perchlorate (EPA Method 314.0)

P

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	7/30/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	EB=(1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(9,10) (12,13) (15,16)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
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	EB-4-073015	Cr^{+6} ClO_4	1518669-02	Water	07/30/15
2	MW-22-3		1518669-03	Water	07/30/15
3	MW-22-2		1518669-04	Water	07/30/15
4	MW-22-1		1518669-05	Water	07/30/15
5	MW-24-4		1518669-06	Water	07/30/15
6	MW-24-3	ClO_4	1518669-07	Water	07/30/15
7	MW-24-2		1518669-08	Water	07/30/15
8	MW-24-1	OPO_4, NO_2, ClO_4, 300.0	1518669-09	Water	07/30/15
9	MW-22-3MS	Cr^{+6} ClO_4	1518669-03MS	Water	07/30/15
10	MW-22-3MSD		1518669-03MSD	Water	07/30/15
11	MW-22-3DUP		1518669-03DUP	Water	07/30/15
12	MW-24-2MS		1518669-08MS	Water	07/30/15
13	MW-24-2MSD		1518669-08MSD	Water	07/30/15
14	MW-24-2DUP		1518669-08DUP	Water	07/30/15
15	MW-24-1MS	OPO_4 NO_2	1518669-09MS	Water	07/30/15
16	MW-24-1MSD		1518669-09MSD	Water	07/30/15
17	MW-24-1DUP		1518669-09DUP	Water	07/30/15

LDC #: 34928B0

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Parameter
1-4, 6-7	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
5	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
8	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 9-14	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 15-17	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 8, 2015

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18879

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-6-080315	1518879-01	Water	08/03/15
EB-6-080315	1518879-02	Water	08/03/15
MW-4-3	1518879-03	Water	08/03/15
MW-4-2	1518879-04	Water	08/03/15
MW-4-1	1518879-05	Water	08/03/15
MW-12-5	1518879-06	Water	08/03/15
MW-12-4**	1518879-07**	Water	08/03/15
MW-12-3	1518879-08	Water	08/03/15
MW-12-2	1518879-09	Water	08/03/15
EB-6-080315MS	1518879-02MS	Water	08/03/15
EB-6-080315MSD	1518879-02MSD	Water	08/03/15

**Indicates sample underwent Level IV review

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). 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) Method 524.2

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 evaluation, 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): 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.

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.

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

Instrument performance was checked 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.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% 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.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all 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 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/05/15	Methyl iodide	44.7	All samples in SDG 15-18879	UJ (all non-detects)	P

V. Laboratory Blanks

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

VI. Field Blanks

Sample TB-6-080315 was identified as a trip blank. No contaminants were found.

Sample EB-6-080315 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) 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

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 continuing calibration %D, data were qualified as estimated 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 (UJ) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NASA JPL, 3Q2015
Volatiles - Data Qualification Summary - SDG 15-18879

Sample	Compound	Flag	A or P	Reason
TB-6-080315 EB-6-080315 MW-4-3 MW-4-2 MW-4-1 MW-12-5 MW-12-4** MW-12-3 MW-12-2	Methyl iodide	UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-18879

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-6-080315

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-01	File ID:	05AUG21.D
Sampled:	08/03/15 06:15	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 13:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0265 Sequence: 1512494 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-6-080315

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-01	File ID:	05AUG21.D
Sampled:	08/03/15 06:15	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 13:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-6-080315

Laboratory:	BC Laboratories		SDG:	15-18879	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518879-01	File ID:	05AUG21.D
Sampled:	08/03/15 06:15	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 13:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U NJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.5500	95.5	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7600	97.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.480	105	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	203833	6.73	224923	6.73	
Chlorobenzene-d5 (IS)	67174	9.73	76720	9.73	
1,4-Difluorobenzene (IS)	282242	7.52	314403	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

EB-6-080315

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-02	File ID:	05AUG08.D
Sampled:	08/03/15 06:30	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 08:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0265 Sequence: 1512494 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-6-080315

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-02	File ID:	05AUG08.D
Sampled:	08/03/15 06:30	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 08:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0265 Sequence: 1512494 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-6-080315

Laboratory:	BC Laboratories		SDG:	15-18879	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518879-02		File ID:	05AUG08.D
Sampled:	08/03/15 06:30	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 08:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.0300	90.3	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8200	98.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9200	99.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	225734	6.73	224923	6.73	
Chlorobenzene-d5 (IS)	76237	9.72	76720	9.73	
1,4-Difluorobenzene (IS)	312869	7.52	314403	7.52	

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-3

Laboratory:	BC Laboratories		SDG:	15-18879	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518879-03	File ID:	05AUG22.D
Sampled:	08/03/15 07:50	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 13:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-3

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-03	File ID:	05AUG22.D
Sampled:	08/03/15 07:50	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 13:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.21	J
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.21	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.18	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.40	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-3

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-03	File ID:	05AUG22.D
Sampled:	08/03/15 07:50	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 13:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0265 Sequence: 1512494 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.8600	98.6	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6700	96.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.490	105	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	221021	6.73	224923	6.73	
Chlorobenzene-d5 (IS)	74320	9.72	76720	9.73	
1,4-Difluorobenzene (IS)	313802	7.52	314403	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-2

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-04	File ID:	05AUG23.D
Sampled:	08/03/15 08:30	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 13:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.45	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.12	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-2

Laboratory:	BC Laboratories		SDG:	15-18879	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518879-04	File ID:	05AUG23.D
Sampled:	08/03/15 08:30	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 13:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.46	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.7	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-2

Laboratory:	BC Laboratories		SDG:	15-18879	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518879-04	File ID:	05AUG23.D
Sampled:	08/03/15 08:30	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 13:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0265 Sequence: 1512494 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.8600	98.6	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9000	99.0	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.060	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	222493	6.73	224923	6.73	
Chlorobenzene-d5 (IS)	76454	9.72	76720	9.73	
1,4-Difluorobenzene (IS)	308342	7.52	314403	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-4-1

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-05	File ID:	05AUG24.D
Sampled:	08/03/15 09:00	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 14:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0265 Sequence: 1512494 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

8/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-4-1

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-05	File ID:	05AUG24.D
Sampled:	08/03/15 09:00	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 14:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0265 Sequence: 1512494 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-4-1

Laboratory:	BC Laboratories		SDG:	15-18879	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518879-05	File ID:	05AUG24.D
Sampled:	08/03/15 09:00	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 14:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U US
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.5600	95.6	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8900	98.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7400	97.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	225745	6.73	224923	6.73	
Chlorobenzene-d5 (IS)	78277	9.73	76720	9.73	
1,4-Difluorobenzene (IS)	306511	7.52	314403	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-5

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-06	File ID:	05AUG25.D
Sampled:	08/03/15 10:50	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 14:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0265 Sequence: 1512494 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.33	J
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.36	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-5

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-06	File ID:	05AUG25.D
Sampled:	08/03/15 10:50	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 14:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0265 Sequence: 1512494 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.090	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.12	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-5

Laboratory:	BC Laboratories		SDG:	15-18879	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518879-06	File ID:	05AUG25.D
Sampled:	08/03/15 10:50	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 14:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.6400	96.4	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.250	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7100	97.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	220865	6.73	224923	6.73	
Chlorobenzene-d5 (IS)	76211	9.73	76720	9.73	
1,4-Difluorobenzene (IS)	295821	7.52	314403	7.52	

9/7/15 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-4

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-07	File ID:	05AUG26.D
Sampled:	08/03/15 11:25	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 15:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.42	J
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.48	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-4

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-07	File ID:	05AUG26.D
Sampled:	08/03/15 11:25	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 15:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.14	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-12-4

Laboratory:	BC Laboratories		SDG:	15-18879	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518879-07		File ID:	05AUG26.D
Sampled:	08/03/15 11:25	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 15:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9000	99.0	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9300	99.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.060	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	219218	6.74	224923	6.73	
Chlorobenzene-d5 (IS)	75400	9.72	76720	9.73	
1,4-Difluorobenzene (IS)	301928	7.51	314403	7.52	

9/7/15 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-3

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-08	File ID:	05AUG27.D
Sampled:	08/03/15 11:55	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 15:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.13	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-3

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-08	File ID:	05AUG27.D
Sampled:	08/03/15 11:55	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 15:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.13	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.26	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-3

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-08	File ID:	05AUG27.D
Sampled:	08/03/15 11:55	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 15:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U 1/15
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.7200	97.2	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7700	97.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9400	99.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	215074	6.73	224923	6.73	
Chlorobenzene-d5 (IS)	74491	9.73	76720	9.73	
1,4-Difluorobenzene (IS)	297542	7.52	314403	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-2

Laboratory:	BC Laboratories			SDG:	15-18879
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518879-09	File ID:	05AUG28.D
Sampled:	08/03/15 12:30	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 15:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-12-2

Laboratory:	BC Laboratories		SDG:	15-18879	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518879-09	File ID:	05AUG28.D
Sampled:	08/03/15 12:30	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 15:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.070	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

8/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:40:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-2

Laboratory:	BC Laboratories		SDG:	15-18879	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518879-09	File ID:	05AUG28.D
Sampled:	08/03/15 12:30	Prepared:	08/05/15 07:00	Analyzed:	08/05/15 15:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0265	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.040	100	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6900	96.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.240	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	213337	6.74	224923	6.73	
Chlorobenzene-d5 (IS)	72817	9.72	76720	9.73	
1,4-Difluorobenzene (IS)	299214	7.52	314403	7.52	

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LDC #: 34928C1

SDG #: 15-18879

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 9/4/15

Page: 1 of 2

Reviewer: Bn

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

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 ≤ 20%, r² ICV ≤ 30%
IV.	Continuing calibration	SW	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 EB = 2
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A ~~N~~	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Target compound identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III 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 Level IV validation

	Client ID	Lab ID	Matrix	Date
1	TB-6-080315	1518879-01	Water	08/03/15
2	EB-6-080315	1518879-02	Water	08/03/15
3	MW-4-3	1518879-03	Water	08/03/15
4	MW-4-2	1518879-04	Water	08/03/15
5	MW-4-1	1518879-05	Water	08/03/15
6	MW-12-5	1518879-06	Water	08/03/15
7	MW-12-4**	1518879-07**	Water	08/03/15
8	MW-12-3	1518879-08	Water	08/03/15
9	MW-12-2	1518879-09	Water	08/03/15
10	EB-6-080315MS	1518879-02MS	Water	08/03/15
11	EB-6-080315MSD	1518879-02MSD	Water	08/03/15
12				
13				

LDC #: 34928C1

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 9/4/15

SDG #: 15-18879

Page: 2 of 2

Laboratory: BC Laboratories, Inc.

Reviewer: BR

2nd Reviewer: CL

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				

Notes:

1	BY H0265-BLK						

LDC #: 3492801

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: CK

Method: Volatiles (EPA Method 524.2)

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				
Were the BFB performance results 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 deviations (%RSD) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %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?			✓	
VII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	✓			
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 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?	✓			

LDC #: 34928C1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within +/-40% from the associated calibration standard?	✓			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	✓			
XI. 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?	✓			
XII. Compound quantitation/RLs				
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. Tentatively identified compounds (TICs)				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	✓			
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

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. Methyl iodide
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1.
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 #: 34928C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: KR
2nd Reviewer: d

METHOD: GC/MS VOA (EPA Method 524.2)
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 all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0%)	Associated Samples	Qualifications
	8/5/15	CCV-05AUG04	W1	44.7	All	J/UJ/P (ND)

CONCAL.1S5

LDC #: 34928C1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

METHOD: GC/MS VOA (EPA Method 524.2)

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 = $(A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/30/2015	1,1-Dichloroethene (IS1)	0.697237	0.697237	0.6682290	0.6682290	7.754823	7.754809
	MS-V5		Trichloroethene (IS2)	0.343890	0.343890	0.3375275	0.3375275	7.469184	7.469187
			1,1,2,2-Tetrachloethane	0.583603	0.583603	0.5832449	0.5832449	6.534171	6.534179

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 #: 34928C1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

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 = $(A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 32/80 std)	Recalculated RRF (RRF 32/80 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/30/2015	Allyl chloride (IS1)	0.633362	0.633362	0.6620764	0.6620764	12.922551	12.922551
	MS-V5		Methyl methacrylate (IS	0.083845	0.083845	0.08494876	0.08494876	8.605336	8.605336
			Pentachloroethane (IS3	0.572308	0.572308	0.5611418	0.5611418	7.802302	7.802317

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#: 34928C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

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

METHOD: GC/MS VOA (EPA Method 524.2)

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 = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	05AUG03	8/5/2015	1,1-Dichloroethene (IS1)	0.668229	0.6143397	0.6143397	8.1	8.1
			Trichloroethene (IS2)	0.337528	0.3189031	0.3189031	5.5	5.5
			1,1,2,2-Tetrachloethane	0.583245	0.5831653	0.5831653	0.01	0.01
2	05AUG04	8/5/2015	Allyl chloride (IS1)	0.662076	0.6356217	0.6356217	4.0	4.0
			Methyl methacrylate (IS2	0.084949	0.08376312	0.08376312	1.4	1.4
			Pentachloroethane (IS3	0.561142	0.5934649	0.5934649	5.8	5.8

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 #: 34928C1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: BR
2nd reviewer: ~~X~~

METHOD: GC/MS VOA (EPA Method 524.2)

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: 7

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.00	9.93	99.3	99.3	0
Bromofluorobenzene					
1,2-Dichlorobenzene-d4		9.90	99.0	99.0	0
Dibromofluoromethane		100.6	101	101	0

Sample ID:

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

Sample ID:

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

Sample ID:

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

LDC#: 34928C1

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: BR

2nd Reviewer

METHOD: GC/MS VOA (EPA Method 524.2)

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

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

RPD = [MSC- MSDC] * 2) / (MSC + MSDC)*100

MSC = Matrix spike percent recovery

MSDC = Matrix spike duplicate percent recovery

MS/MSD samples: 10/11

Compound	Spike Added (µg/L)		Sample Conc. (µg/L)	Spiked Sample Concentration (µg/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
[redacted]	MS	MSD	-------	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
1,1-Dichloroethene	25.00	25.00	0	26.670	26.560	107%	107%	106%	106%	0.413%	0.413%
Trichloroethene	25.00	25.00	0	24.720	25.500	98.9%	98.9%	102%	102%	3.11%	3.11%
Benzene	25.00	25.00	0	25.440	26.230	102%	102%	104.9%	104.9%	3.06%	3.06%
Toluene	25.00	25.00	0	24.540	25.200	98.2%	98.2%	101%	101%	2.65%	2.65%
Chlorobenzene	25.00	25.00	0	23.730	24.100	94.9%	94.9%	96.4%	96.4%	1.55%	1.55%

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 #: 34928C

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: BR
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

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: BY140265-BS1

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	25.00		25.860		103	103				
Trichloroethene			24.380		97.5	97.5				
Benzene			24.160		96.6	96.6				
Toluene			23.730		94.9	94.9				
Chlorobenzene			23.650		94.6	94.6				

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 #: 34928C1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: BR
2nd reviewer: ✓

METHOD: GC/MS VOA (EPA Method 524.2)

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:

S=0.14

Sample I.D. 7, 5:

Conc. = $\frac{(1385)(10)(\quad)}{(301928)(0.3375275)(\quad)}$

= 0.135905558 ug/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 3, 2015

Parameters: Chromium

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18879

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-6-080315	1518879-02	Water	08/03/15
MW-4-3	1518879-03	Water	08/03/15
MW-4-2	1518879-04	Water	08/03/15
MW-4-1	1518879-05	Water	08/03/15
MW-12-3	1518879-08	Water	08/03/15
MW-12-2	1518879-09	Water	08/03/15
EB-6-080315MS	1518879-02MS	Water	08/03/15
EB-6-080315MSD	1518879-02MSD	Water	08/03/15
EB-6-080315DUP	1518879-02DUP	Water	08/03/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Chromium by Environmental Protection Agency (EPA) Method 200.8

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): 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.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected 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 or analyte 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.

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% with the following exceptions:

Date	Isotope	Analyte	%RSD	Associated Samples	Flag	A or P
08/15/15	Magnesium^{24}	Chromium	37.6	All samples in SDG 15-18879	J (all detects) UJ (all non-detects)	P
08/15/15	Indium^{115}	Chromium	31.5	All samples in SDG 15-18879	J (all detects) UJ (all non-detects)	P

III. Instrument Calibration

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

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

ICP interference check sample analyses were not required by the method.

V. Laboratory Blanks

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

VI. Field Blanks

Sample EB-6-080315 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. Duplicate Sample Analysis

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

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

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Raw data were not reviewed for Level III validation.

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 method. No results were rejected in this SDG.

Due to ICPMS tune %RSD, data were qualified as estimated in six 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.

NASA JPL, 3Q2015
Chromium - Data Qualification Summary - SDG 15-18879

Sample	Analyte	Flag	A or P	Reason
EB-6-080315 MW-4-3 MW-4-2 MW-4-1 MW-12-3 MW-12-2	Chromium	J (all detects) UJ (all non-detects)	P	ICPMS Tune (%RSD)

NASA JPL, 3Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-18879

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:44:03PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

EB-6-080315

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-02
File ID: PE_EL2_150815-043
Sampled: 08/03/15 06:30
Prepared: 08/10/15 08:30
Analyzed: 08/15/15 13:32
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0712
Sequence: 1513179
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U UJ	EPA-200.8

8/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:44:03PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-4-3

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-03
File ID: PE_EL2_150815-055
Sampled: 08/03/15 07:50
Prepared: 08/10/15 08:30
Analyzed: 08/15/15 14:20
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0712
Sequence: 1513179
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	120	1	J	EPA-200.8

8/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:44:03PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-4-2

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-04
File ID: PE_EL2_150815-056
Sampled: 08/03/15 08:30
Prepared: 08/10/15 08:30
Analyzed: 08/15/15 14:23
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0712
Sequence: 1513179
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.4	1	J J	EPA-200.8

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:44:03PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-4-1

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-05
File ID: PE_EL2_150815-057
Sampled: 08/03/15 09:00
Prepared: 08/10/15 08:30
Analyzed: 08/15/15 14:27
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0712
Sequence: 1513179
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U UJ	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:44:03PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-12-3

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-08
File ID: PE_EL2_150815-058
Sampled: 08/03/15 11:55
Prepared: 08/10/15 08:30
Analyzed: 08/15/15 14:30
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0712
Sequence: 1513179
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U UJ	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:44:03PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-12-2

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-09
File ID: PE_EL2_150815-059
Sampled: 08/03/15 12:30
Prepared: 08/10/15 08:30
Analyzed: 08/15/15 14:33
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0712
Sequence: 1513179
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.87	1	J J	EPA-200.8

9/7/15

LDC #: 34928C4a

SDG #: 15-18879

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/1/15

Page: 1 of 1

Reviewer: JD

2nd Reviewer: [illegible]

METHOD: Chromium (EPA Method 200.8)

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	8/3/15
II.	ICP/MS Tune	SW	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not Required
V.	Laboratory Blanks	A	
VI.	Field Blanks	ND	EB=(1)
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(7.8)
VIII.	Duplicate sample analysis	A	DUP
IX.	ICP Serial Dilution	A	SER
X.	Laboratory control samples	A	LCS
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	EB-6-080315	1518879-02	Water	08/03/15
2	MW-4-3	1518879-03	Water	08/03/15
3	MW-4-2	1518879-04	Water	08/03/15
4	MW-4-1	1518879-05	Water	08/03/15
5	MW-12-3	1518879-08	Water	08/03/15
6	MW-12-2	1518879-09	Water	08/03/15
7	EB-6-080315MS	1518879-02MS	Water	08/03/15
8	EB-6-080315MSD	1518879-02MSD	Water	08/03/15
9	EB-6-080315DUP	1518879-02DUP	Water	08/03/15
10				
11				
12				
13				
14				

Notes:

LDC #: 34928C4q

VALIDATION FINDINGS WORKSHEET
Tune (ICP-MS)

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

METHOD: Metals (EPA SW846 Method6020)

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

Y N N/A Were all isotopes in the tuning solution mass resolution within 0.1amu?

Y N N/A Were %RSD of isotopes in the tuning solution ≤5%?

#	Date	Isotope	Associated Metals	Mass (Limits)	RSD (≤5%)	Associated Samples	Qualifications
	08/15/15	Mg^{24} ~~24.0~~	Cr		37.6	All	J/UJ/P (det/nd)
		In^{115} ~~114.9~~	Cr		31.5		J/UJ/P (det/nd)

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 3, 2015

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18879

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-6-080315	1518879-02	Water	08/03/15
MW-4-3	1518879-03	Water	08/03/15
MW-4-2	1518879-04	Water	08/03/15
MW-4-1	1518879-05	Water	08/03/15
MW-12-5	1518879-06	Water	08/03/15
MW-12-4**	1518879-07**	Water	08/03/15
MW-12-3	1518879-08	Water	08/03/15
MW-12-2	1518879-09	Water	08/03/15
EB-6-080315MS	1518879-02MS	Water	08/03/15
EB-6-080315MSD	1518879-02MSD	Water	08/03/15
EB-6-080315DUP	1518879-02DUP	Water	08/03/15

**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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7196
Perchlorate by EPA Method 314.0

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): 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.

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.

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

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

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

V. Field Blanks

Sample EB-6-080315 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. Duplicates

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 methods. 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 methods. 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.

NASA JPL, 3Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-18879

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-18879

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:43:14PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

EB-6-080315

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-02
File ID: 150803 1959 CR6-037
Sampled: 08/03/15 06:30
Prepared: 08/03/15 19:59
Analyzed: 08/03/15 22:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0352
Sequence: 1512544
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:43:14PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-4-3

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-03
File ID: 150803 1959 CR6-041
Sampled: 08/03/15 07:50
Prepared: 08/03/15 19:59
Analyzed: 08/03/15 22:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0352
Sequence: 1512544
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

8/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:43:14PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-4-2

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-04
File ID: 150803 1959 CR6-042
Sampled: 08/03/15 08:30
Prepared: 08/03/15 19:59
Analyzed: 08/03/15 22:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0352
Sequence: 1512544
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:43:14PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-4-1

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-05
File ID: 150803 1959 CR6-043
Sampled: 08/03/15 09:00
Prepared: 08/03/15 19:59
Analyzed: 08/03/15 22:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0352
Sequence: 1512544
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:43:14PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-12-3

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-08
File ID: 150803 1959 CR6-044
Sampled: 08/03/15 11:55
Prepared: 08/03/15 19:59
Analyzed: 08/03/15 22:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0352
Sequence: 1512544
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:43:14PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-12-2

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-09
File ID: 150803 1959 CR6-030
Sampled: 08/03/15 12:30
Prepared: 08/03/15 19:59
Analyzed: 08/03/15 20:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0352
Sequence: 1512544
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:42:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-6-080315

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-02
File ID: F081715.seq-8.0000.txt
Sampled: 08/03/15 06:30
Prepared: 08/17/15 08:00
Analyzed: 08/17/15 09:50
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1490
Sequence: 1513281
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:42:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-4-3

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-03
File ID: F081715.seq-12.0000.txt
Sampled: 08/03/15 07:50
Prepared: 08/17/15 08:00
Analyzed: 08/17/15 10:48
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1490
Sequence: 1513281
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:42:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-4-2

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-04
File ID: F081715.seq-13.0000.txt
Sampled: 08/03/15 08:30
Prepared: 08/17/15 08:00
Analyzed: 08/17/15 11:02
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1490
Sequence: 1513281
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	5.5	1		EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:42:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-4-1

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-05
File ID: F081715.seq-16.0000.txt
Sampled: 08/03/15 09:00
Prepared: 08/17/15 08:00
Analyzed: 08/17/15 11:45
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1490
Sequence: 1513281
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:42:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-12-5

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-06
File ID: F081715.seq-17.0000.txt
Sampled: 08/03/15 10:50
Prepared: 08/17/15 08:00
Analyzed: 08/17/15 11:59
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1490
Sequence: 1513281
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.0	1	J	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:42:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-12-4

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-07
File ID: F081715.seq-18.0000.txt
Sampled: 08/03/15 11:25
Prepared: 08/17/15 08:00
Analyzed: 08/17/15 12:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1490
Sequence: 1513281
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.0	1	J	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:42:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-12-3

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-08
File ID: F081715.seq-19.0000.txt
Sampled: 08/03/15 11:55
Prepared: 08/17/15 08:00
Analyzed: 08/17/15 12:28
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1490
Sequence: 1513281
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:42:04PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-12-2

Laboratory: BC Laboratories
SDG: 15-18879
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518879-09
File ID: F081715.seq-20.0000.txt
Sampled: 08/03/15 12:30
Prepared: 08/17/15 08:00
Analyzed: 08/17/15 12:42
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1490
Sequence: 1513281
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.4	1	J	EPA-314.0

9/7/15

LDC #: 34928C6
SDG #: 15-18879
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 9/2/15
Page: 1 of 1
Reviewer: JD
2nd Reviewer: [illegible]

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0)

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	8/3/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	EB=(1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(9,10)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Sample result verification	A	Not reviewed for Level III validation.
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:

** Indicates sample underwent Level IV validation

	Client ID		Lab ID	Matrix	Date
1	EB-6-080315	ClO4 Cr+6	1518879-02	Water	08/03/15
2	MW-4-3		1518879-03	Water	08/03/15
3	MW-4-2		1518879-04	Water	08/03/15
4	MW-4-1		1518879-05	Water	08/03/15
5	MW-12-5		1518879-06	Water	08/03/15
6	MW-12-4**		1518879-07**	Water	08/03/15
7	MW-12-3	Cr+6	1518879-08	Water	08/03/15
8	MW-12-2		1518879-09	Water	08/03/15
9	EB-6-080315MS	Cr+6	1518879-02MS	Water	08/03/15
10	EB-6-080315MSD		1518879-02MSD	Water	08/03/15
11	EB-6-080315DUP		1518879-02DUP	Water	08/03/15
12					
13					
14					
15					
16					

Notes:

LDC #: 34928SO

VALIDATION FINDINGS CHECKLIST

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

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 #: 34928C10

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: CR

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 #: 34928C6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Parameter
1-4, 7-8	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
5-6	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC 9-11	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 34928C6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: SD
2nd Reviewer: 9

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of ClO4 was recalculated.Calibration date: 8/8/15

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	ClO4	s1	0.00	0	0.998727	0.995095	Y*
		s2	2	0.002			
		s3	4	0.003			
		s4	6	0.005			
		s5	10	0.009			
		s6	20	0.017			
JCW 8:24 Calibration verification		Found 11.25ug/L	True 10 ug/L		113%R	95.6%R	Y*
(1) CCW 11:16 Calibration verification		11.25 ug/L	10 ug/L		113%R	111%R	Y*
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. *Rounding: Not enough sig figs in raw data

LDC #: 34928C6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: JO
2nd Reviewer: CL

METHOD: Inorganics, Method See Cover

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

$\%R = \frac{Found}{True} \times 100$ 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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 9:36	Laboratory control sample	ClO4	10 ug/L	10 ug/L	100%R	96.6%R	Y *
MS 10:19	Matrix spike sample	↓	(SSR-SR) 10 ug/L	10.101 ug/L	99%R	95.5%R	↓ *
DUP 10:05	Duplicate sample	↓	ND	ND	0%RPD	NR	Y

Comments: *Rounding: Low Sig figs reported

TOTCLC.6

LDC #: 34928S0

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 (6) ClO4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{A}{0.0008}$

A = 0.003

Recalculation: $\frac{0.003}{0.0008} = 3.75 ug/L \approx 3.8 ug/L$

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	6	ClO4	3.8	3.8	Y*

Note: *Rounding = low sig fig in RD

RECALC.6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 8, 2015

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-19097

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-7-080415	1519097-01	Water	08/04/15
EB-7-080415	1519097-02	Water	08/04/15
MW-14-5	1519097-03	Water	08/04/15
MW-14-4**	1519097-04**	Water	08/04/15
MW-14-3	1519097-05	Water	08/04/15
MW-14-2	1519097-06	Water	08/04/15
DUP-4-3Q15	1519097-07	Water	08/04/15
MW-21-5	1519097-08	Water	08/04/15
MW-21-4	1519097-09	Water	08/04/15
MW-21-3**	1519097-10**	Water	08/04/15
MW-21-2	1519097-11	Water	08/04/15
MW-21-2MS	1519097-11MS	Water	08/04/15
MW-21-2MSD	1519097-11MSD	Water	08/04/15

**Indicates sample underwent Level IV review

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). 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) Method 524.2

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 evaluation, 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): 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.

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.

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

Instrument performance was checked 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.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% 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.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all 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 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/05/15	Bromomethane Methyl iodide	38.8 49.9	All samples in SDG 15-19097	UJ (all non-detects) UJ (all non-detects)	P

V. Laboratory Blanks

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

VI. Field Blanks

Sample TB-7-080415 was identified as a trip blank. No contaminants were found.

Sample EB-7-080415 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) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-14-2 and DUP-4-3Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-14-2	DUP-4-3Q15	
Chloroform	0.54	0.87	47
1,1-Dichloroethane	0.15	0.35	80
cis-1,2-Dichloroethene	0.17	0.37	74
Tetrachloroethene	0.40	0.95	81
Trichloroethene	2.6	5.0	63

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 continuing calibration %D, data were qualified as estimated in eleven 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 (UJ) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NASA JPL, 3Q2015
Volatiles - Data Qualification Summary - SDG 15-19097

Sample	Compound	Flag	A or P	Reason
TB-7-080415 EB-7-080415 MW-14-5 MW-14-4** MW-14-3 MW-14-2 DUP-4-3Q15 MW-21-5 MW-21-4 MW-21-3** MW-21-2	Bromomethane Methyl iodide	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-19097

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-7-080415

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-01	File ID:	05AUG51.D
Sampled:	08/04/15 06:20	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 00:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15 Q

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-7-080415

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-01	File ID:	05AUG51.D
Sampled:	08/04/15 06:20	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 00:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-7-080415

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-01	File ID:	05AUG51.D
Sampled:	08/04/15 06:20	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 00:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9400	99.4	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8300	98.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.130	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	211145	6.74	221671	6.73	
Chlorobenzene-d5 (IS)	72774	9.72	77005	9.72	
1,4-Difluorobenzene (IS)	294814	7.52	298239	7.52	

9/7/15 9

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-7-080415

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-02	File ID:	05AUG52.D
Sampled:	08/04/15 06:40	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 00:57
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-7-080415

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-02	File ID:	05AUG52.D
Sampled:	08/04/15 06:40	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 00:57
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-7-080415

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-02	File ID:	05AUG52.D
Sampled:	08/04/15 06:40	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 00:57
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9500	99.5	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.120	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.560	106	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	209825	6.73	221671	6.73	
Chlorobenzene-d5 (IS)	69020	9.72	77005	9.72	
1,4-Difluorobenzene (IS)	286199	7.52	298239	7.52	

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BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-5

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-03	File ID:	05AUG53.D
Sampled:	08/04/15 07:20	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 01:20
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.38	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-5

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-03	File ID:	05AUG53.D
Sampled:	08/04/15 07:20	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 01:20
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-5

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1519097-03		File ID:	05AUG53.D
Sampled:	08/04/15 07:20	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 01:20
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.310	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9000	99.0	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.090	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	206444	6.74	221671	6.73	
Chlorobenzene-d5 (IS)	69951	9.72	77005	9.72	
1,4-Difluorobenzene (IS)	290320	7.52	298239	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-4

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-04	File ID:	05AUG54.D
Sampled:	08/04/15 08:00	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 01:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.19	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.13	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-4

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-04	File ID:	05AUG54.D
Sampled:	08/04/15 08:00	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 01:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.25	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.20	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-4

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-04	File ID:	05AUG54.D
Sampled:	08/04/15 08:00	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 01:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.470	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9100	99.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9400	99.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	203132	6.73	221671	6.73	
Chlorobenzene-d5 (IS)	72479	9.72	77005	9.72	
1,4-Difluorobenzene (IS)	285936	7.52	298239	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-3

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-05	File ID:	05AUG55.D
Sampled:	08/04/15 08:40	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 02:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.52	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.37	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-3

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-05	File ID:	05AUG55.D
Sampled:	08/04/15 08:40	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 02:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.66	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.6	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-3

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1519097-05		File ID:	05AUG55.D
Sampled:	08/04/15 08:40	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 02:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.240	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7600	97.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.280	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	210785	6.74	221671	6.73	
Chlorobenzene-d5 (IS)	72857	9.73	77005	9.72	
1,4-Difluorobenzene (IS)	293447	7.52	298239	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-2

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-06	File ID:	05AUG56.D
Sampled:	08/04/15 09:20	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 02:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.54	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.15	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.17	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-2

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-06	File ID:	05AUG56.D
Sampled:	08/04/15 09:20	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 02:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.40	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	2.6	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-2

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-06	File ID:	05AUG56.D
Sampled:	08/04/15 09:20	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 02:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U US
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.280	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8800	98.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.370	104	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	205818	6.74	221671	6.73	
Chlorobenzene-d5 (IS)	71283	9.72	77005	9.72	
1,4-Difluorobenzene (IS)	288045	7.52	298239	7.52	

8/7/15 Q

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-4-3Q15

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-07	File ID:	05AUG57.D
Sampled:	08/04/15 09:30	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 02:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.87	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.35	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.37	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-4-3Q15

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-07	File ID:	05AUG57.D
Sampled:	08/04/15 09:30	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 02:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.95	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	5.0	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-4-3Q15

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-07	File ID:	05AUG57.D
Sampled:	08/04/15 09:30	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 02:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.210	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8500	98.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.320	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	187665	6.74	221671	6.73	
Chlorobenzene-d5 (IS)	63999	9.72	77005	9.72	
1,4-Difluorobenzene (IS)	260242	7.52	298239	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-5

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-08	File ID:	05AUG58.D
Sampled:	08/04/15 11:45	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 03:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	6.0	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.090	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-5

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-08	File ID:	05AUG58.D
Sampled:	08/04/15 11:45	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 03:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.81	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.14	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-5

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-08	File ID:	05AUG58.D
Sampled:	08/04/15 11:45	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 03:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.240	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8500	98.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7000	97.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	210425	6.73	221671	6.73	
Chlorobenzene-d5 (IS)	72344	9.72	77005	9.72	
1,4-Difluorobenzene (IS)	290442	7.52	298239	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-4

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-09	File ID:	05AUG59.D
Sampled:	08/04/15 12:20	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 03:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U US
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	5.4	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-4

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-09	File ID:	05AUG59.D
Sampled:	08/04/15 12:20	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 03:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.74	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.12	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-4

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-09	File ID:	05AUG59.D
Sampled:	08/04/15 12:20	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 03:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.510	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7800	97.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.600	106	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	208491	6.73	221671	6.73	
Chlorobenzene-d5 (IS)	70877	9.72	77005	9.72	
1,4-Difluorobenzene (IS)	293796	7.52	298239	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-3

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-10	File ID:	05AUG60.D
Sampled:	08/04/15 12:50	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 03:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U VS
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.91	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.13	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.30	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15 Q

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-3

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-10	File ID:	05AUG60.D
Sampled:	08/04/15 12:50	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 03:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.18	J
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	2.1	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.99	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-3

Laboratory:	BC Laboratories			SDG:	15-19097		
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells		
Matrix:	Water	Laboratory ID:	1519097-10	File ID:	05AUG60.D		
Sampled:	08/04/15 12:50	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 03:59		
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml		
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.370	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.3600	93.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.690	107	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	209099	6.73	221671	6.73	
Chlorobenzene-d5 (IS)	69105	9.72	77005	9.72	
1,4-Difluorobenzene (IS)	293404	7.52	298239	7.52	

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-2

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-11	File ID:	05AUG50.D
Sampled:	08/04/15 13:30	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 00:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.27	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-2

Laboratory:	BC Laboratories		SDG:	15-19097	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519097-11	File ID:	05AUG50.D
Sampled:	08/04/15 13:30	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 00:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence: 1512494	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.87	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.19	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:56:39PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-2

Laboratory:	BC Laboratories			SDG:	15-19097
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519097-11	File ID:	05AUG50.D
Sampled:	08/04/15 13:30	Prepared:	08/05/15 11:12	Analyzed:	08/06/15 00:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0266	Sequence:	1512494	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U US
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.6800	96.8	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.220	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.150	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	218332	6.74	221671	6.73	
Chlorobenzene-d5 (IS)	71351	9.72	77005	9.72	
1,4-Difluorobenzene (IS)	291858	7.52	298239	7.52	

9/7/15 R

LDC #: 34928D1

SDG #: 15-19097

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 9/4/15

Page: 1 of 2

Reviewer: KR

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

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 ≤ 20%, r² ; ICV ≤ 30%
IV.	Continuing calibration	SW	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 EB = 2
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A ~~N~~	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	FD = 6 + 7
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Target compound identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III 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 Level IV validation

	Client ID	Lab ID	Matrix	Date
1	TB-7-080415	1519097-01	Water	08/04/15
2	EB-7-080415	1519097-02	Water	08/04/15
3	MW-14-5	1519097-03	Water	08/04/15
4	MW-14-4**	1519097-04**	Water	08/04/15
5	MW-14-3	1519097-05	Water	08/04/15
6	MW-14-2	1519097-06	Water	08/04/15
7	DUP-4-3Q15	1519097-07	Water	08/04/15
8	MW-21-5	1519097-08	Water	08/04/15
9	MW-21-4	1519097-09	Water	08/04/15
10	MW-21-3**	1519097-10**	Water	08/04/15
11	MW-21-2	1519097-11	Water	08/04/15
12	MW-21-2MS	1519097-11MS	Water	08/04/15
13	MW-21-2MSD	1519097-11MSD	Water	08/04/15

LDC #: 34928D1

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 9/4/15

SDG #: 15-19097

Page: 2 of 2

Laboratory: BC Laboratories, Inc.

Reviewer: KR

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				
17				
18				

Notes:

1	~~BH~~ BY170266-BLK1						

LDC #: 34928 D1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: [illegible]

Method: Volatiles (EPA Method 524.2)

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				
Were the BFB performance results 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 deviations (%RSD) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %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?			✓	
VII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	✓			
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 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?	✓			

LDC #: 34928D1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within +/-40% from the associated calibration standard?	✓			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	✓			
XI. 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?	✓			
XII. Compound quantitation/RLs				
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. Tentatively identified compounds (TICs)				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	✓			
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

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. Methyl iodide
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1.
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 #: 34928D1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

METHOD: GC/MS VOA (EPA Method 524.2)
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 all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	8/5/15	CCV-05AUG34/35	B	38.8	All	J/UJ/P (ND)
			W1	49.9		

CONCAL.1S5

LDC #: 34928D1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: KM
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD
	6	7	
K	0.54	0.87	47
I	0.15	0.35	80
QQQ	0.17	0.37	74
AA	0.40	0.95	81
S	2.6	5.0	63

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 34928D1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

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

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/30/2015	1,1-Dichloroethene (IS1)	0.697237	0.697237	0.6682290	0.6682290	7.754823	7.754809
	MS-V5		Trichloroethene (IS2)	0.343890	0.343890	0.3375275	0.3375275	7.469184	7.469187
			1,1,2,2-Tetrachloethane	0.583603	0.583603	0.5832449	0.5832449	6.534171	6.534179

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 #: 34928D1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: ✓

METHOD: GC/MS VOA (EPA Method 524.2)

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

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 32/80 std)	Recalculated RRF (RRF 32/80 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/30/2015	Allyl chloride (IS1)	0.633362	0.633362	0.6620764	0.6620764	12.922551	12.922551
	MS-V5		Methyl methacrylate (IS2	0.083845	0.083845	0.08494876	0.08494876	8.605336	8.605336
			Pentachloroethane (IS3	0.572308	0.572308	0.5611418	0.5611418	7.802302	7.802317

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#: 34928D1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: BR
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

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 = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	05AUG34	8/5/2015	1,1-Dichloroethene (IS1)	0.668229	0.6628618	0.6628618	0.8	0.8
			Trichloroethene (IS2)	0.337528	0.3305411	0.3305411	2.1	2.1
			1,1,2,2-Tetrachloethane	0.583245	0.5888803	0.5888803	1.0	1.0
2	05AUG35	8/5/2015	Allyl chloride (IS1)	0.662076	0.5695236	0.5695236	14.0	14.0
			Methyl methacrylate (IS2	0.084949	0.08389245	0.08389245	1.2	1.2
			Pentachloroethane (IS3	0.561142	0.5154292	0.5154292	8.1	8.1

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 #: 34928D1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: BR
2nd reviewer: ✗

METHOD: GC/MS VOA (EPA Method 524.2)

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: ~~Ep~~ 10

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.00	9.36	93.6	93.6	0
Bromofluorobenzene		10.69	107	107	0
1,2-Dichlorobenzene-d4		10.37	104	104	0
Dibromofluoromethane					

Sample ID:

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

Sample ID:

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

Sample ID:

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

LDC#: 34928D1

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: BR

2nd Reviewer

METHOD: GC/MS VOA (EPA Method 524.2)

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

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

RPD = [MSC- MSDC] * 2) / (MSC + MSDC)*100

MSC = Matrix spike percent recovery

MSDC = Matrix spike duplicate percent recovery

MS/MSD samples: 12/13

Compound	Spike Added (µg/L)		Sample Conc. (µg/L)	Spiked Sample Concentration (µg/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-------	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
1,1-Dichloroethene	25.00	25.00	0	26.120	26.430	104%	104%	106%	106%	1.18%	1.18%
Trichloroethene	25.00	25.00	0.19	25.300	25.640	100%	100%	102%	102%	1.33%	1.33%
Benzene	25.00	25.00	0	23.720	24.040	94.9%	94.9%	96.2%	96.2%	1.34%	1.34%
Toluene	25.00	25.00	0	24.880	24.730	99.5%	99.5%	98.9%	98.9%	0.605%	0.605%
Chlorobenzene	25.00	25.00	0	23.760	22.670	95.0%	95.0%	90.7%	90.7%	4.70%	4.70%

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 #: 34928 D1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: BR
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

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: BY1T0266 - BS1

Compound	Spike Added (µg/L)		Spiked Sample Concentration (µg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	25.00		25.330		101	101				
Trichloroethene			25.510		102	102				
Benzene			23.450		93.8	93.8				
Toluene			23.590		94.4	94.4				
Chlorobenzene			24.170		96.7	96.7				

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 #: 34928D1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: BR
2nd reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

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. 10, S:

S= 0.99

Conc. = $\frac{(9769)(10)(\quad)(\quad)}{(293484)(0.3375275)(\quad)}$

= 0.986449635 ug/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 3, 2015

Parameters: Chromium

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-19097

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-7-080415	1519097-02	Water	08/04/15
MW-14-3	1519097-05	Water	08/04/15
MW-14-2	1519097-06	Water	08/04/15
DUP-4-3Q15	1519097-07	Water	08/04/15
MW-21-5	1519097-08	Water	08/04/15
MW-21-4	1519097-09	Water	08/04/15
MW-21-3**	1519097-10**	Water	08/04/15
MW-21-2	1519097-11	Water	08/04/15
MW-21-2MS	1519097-11MS	Water	08/04/15
MW-21-2MSD	1519097-11MSD	Water	08/04/15
MW-21-2DUP	1519097-11DUP	Water	08/04/15

**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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Chromium by Environmental Protection Agency (EPA) Method 200.8

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): 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.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected 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 or analyte 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.

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 method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

ICP interference check sample analyses were not required by the method.

V. Laboratory Blanks

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

VI. Field Blanks

Sample EB-7-080415 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. Duplicate Sample Analysis

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

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

XI. Field Duplicates

Samples MW-14-2 and DUP-4-3Q15 were identified as field duplicates. No results were detected in any of the samples.

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. 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.

NASA JPL, 3Q2015
Chromium - Data Qualification Summary - SDG 15-19097

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-19097

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 4:00:18PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

EB-7-080415

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-02
File ID: PE_EL2_150810-068
Sampled: 08/04/15 06:40
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 17:15
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0741
Sequence: 1512857
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 4:00:18PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-14-3

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-05
File ID: PE_EL2_150810-069
Sampled: 08/04/15 08:40
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 17:18
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0741
Sequence: 1512857
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 4:00:18PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-14-2

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-06
File ID: PE_EL2_150810-070
Sampled: 08/04/15 09:20
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 17:22
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0741
Sequence: 1512857
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 4:00:18PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

DUP-4-3Q15

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-07
File ID: PE_EL2_150810-071
Sampled: 08/04/15 09:30
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 17:25
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0741
Sequence: 1512857
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/8/15 q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 4:00:18PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-21-5

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-08
File ID: PE_EL2_150810-072
Sampled: 08/04/15 11:45
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 17:29
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0741
Sequence: 1512857
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.81	1	J	EPA-200.8

9/8/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 4:00:18PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-21-4

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-09
File ID: PE_EL2_150810-073
Sampled: 08/04/15 12:20
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 17:32
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0741
Sequence: 1512857
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.68	1	J	EPA-200.8

9/8/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 4:00:18PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-21-3

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-10
File ID: PE_EL2_150810-074
Sampled: 08/04/15 12:50
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 17:36
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0741
Sequence: 1512857
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/8/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 4:00:18PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-21-2

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-11
File ID: PE_EL2_150810-058
Sampled: 08/04/15 13:30
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 16:27
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0741
Sequence: 1512857
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/8/15

LDC #: 34928D4a

SDG #: 15-19097

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 9/2/15

Page: 1 of 1

Reviewer: JD

2nd Reviewer: a

METHOD: Chromium (EPA Method 200.8)

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	8/4/15
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not Required
V.	Laboratory Blanks	A	
VI.	Field Blanks	ND	EB=(1)
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/D= (9,10)
VIII.	Duplicate sample analysis	A	DUP
IX.	ICP Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	ND	FD= (3,4)
XII.	Internal Standard (ICP-MS)	A	Not Reviewed for Level 3
XIII.	Sample Result Verification	A	Not reviewed for Level III 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 Level IV validation

	Client ID	Lab ID	Matrix	Date
1	EB-7-080415	1519097-02	Water	08/04/15
2	MW-14-3	1519097-05	Water	08/04/15
3	MW-14-2	1519097-06	Water	08/04/15
4	DUP-4-3Q15	1519097-07	Water	08/04/15
5	MW-21-5	1519097-08	Water	08/04/15
6	MW-21-4	1519097-09	Water	08/04/15
7	MW-21-3**	1519097-10**	Water	08/04/15
8	MW-21-2	1519097-11	Water	08/04/15
9	MW-21-2MS	1519097-11MS	Water	08/04/15
10	MW-21-2MSD	1519097-11MSD	Water	08/04/15
11	MW-21-2DUP	1519097-11DUP	Water	08/04/15
12				
13				
14				

Notes:

LDC #: 34928D49

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: [illegible]

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?	✓			

LDC #: 34928D4G

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: [illegible]

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 #: 34928A4a

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: JD
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 / True x 100

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 15:22	ICP/MS (Initial calibration)	Cr	47.379 ug/L	50 ug/L	94.8%R	94.8%R	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
6) CCV 16:59	ICP/MS (Continuing calibration)	Cr	37.358 ug/L	40 ug/L	93.4%R	93.4%R	Y
	CVAA (Contining calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments:

LDC #: 34928D4a

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: JD
2nd Reviewer: 9

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)
N	ICP interference check						
LCS 16:19	Laboratory control sample	Cr	39.475 ug/L	40 ug/L	98.7%R	98.7%R	Y
MS 16:37	Matrix spike		(SSR-SR) 37.284 ug/L	40 ug/L	93.2%R	93.2%R	
MSD 16:41	Duplicate		36.924 ug/L	37.284 ug/L	0.97%RPD	0.97%RPD	
SER 16:34	ICP serial dilution		ND	ND	0%D	NR	Y

Comments:

TOTCLC.4SW

LDC #: 34928D4q

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JD
2nd reviewer: [illegible]

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 (7) Cr were recalculated and verified using the following equation:

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

Recalculation:

ND

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

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
	7	Cr	ND	ND	Y

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 3, 2015

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-19097

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-7-080415	1519097-02	Water	08/04/15
MW-14-5	1519097-03	Water	08/04/15
MW-14-4**	1519097-04**	Water	08/04/15
MW-14-3	1519097-05	Water	08/04/15
MW-14-2	1519097-06	Water	08/04/15
DUP-4-3Q15	1519097-07	Water	08/04/15
MW-21-5	1519097-08	Water	08/04/15
MW-21-4	1519097-09	Water	08/04/15
MW-21-3**	1519097-10**	Water	08/04/15
MW-21-2	1519097-11	Water	08/04/15
MW-21-2MS	1519097-11MS	Water	08/04/15
MW-21-2MSD	1519097-11MSD	Water	08/04/15
MW-21-2DUP	1519097-11DUP	Water	08/04/15

**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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7196
Perchlorate by EPA Method 314.0

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): 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.

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.

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

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

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

V. Field Blanks

Sample EB-7-080415 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. Duplicates

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 methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples MW-14-2 and DUP-4-3Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-14-2	DUP-4-3Q15	
Perchlorate	4.9 ug/L	5.5 ug/L	12
Hexavalent chromium	0.00070U mg/L	0.00075 mg/L	200

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 methods. 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.

NASA JPL, 3Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-19097

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-19097

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-7-080415

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-02
File ID: F081715A.seq-19.0000.txt
Sampled: 08/04/15 06:40
Prepared: 08/17/15 19:00
Analyzed: 08/18/15 01:09
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1610
Sequence: 1513423
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
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INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-14-5

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-03
File ID: F081715A.seq-20.0000.txt
Sampled: 08/04/15 07:20
Prepared: 08/17/15 19:00
Analyzed: 08/18/15 01:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1610
Sequence: 1513423
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15

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Project: JPL- GW Monitoring Wells
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INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-14-4

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-04
File ID: F081715A.seq-23.0000.txt
Sampled: 08/04/15 08:00
Prepared: 08/17/15 19:00
Analyzed: 08/18/15 02:06
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1610
Sequence: 1513423
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.3	1		EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

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Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-14-3

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-05
File ID: F081715A.seq-24.0000.txt
Sampled: 08/04/15 08:40
Prepared: 08/17/15 19:00
Analyzed: 08/18/15 02:20
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1610
Sequence: 1513423
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	5.5	1		EPA-314.0

8/7/15

Tidewater Inc.
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Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-14-2

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-06
File ID: F081715A.seq-25.0000.txt
Sampled: 08/04/15 09:20
Prepared: 08/17/15 19:00
Analyzed: 08/18/15 02:35
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1610
Sequence: 1513423
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.9	1		EPA-314.0

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

DUP-4-3Q15

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-07
File ID: F081715A.seq-26.0000.txt
Sampled: 08/04/15 09:30
Prepared: 08/17/15 19:00
Analyzed: 08/18/15 02:49
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1610
Sequence: 1513423
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	5.5	1		EPA-314.0

9/7/15 R

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-21-5

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-08
File ID: F081715A.seq-27.0000.txt
Sampled: 08/04/15 11:45
Prepared: 08/17/15 19:00
Analyzed: 08/18/15 03:03
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1610
Sequence: 1513423
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.7	1	J	EPA-314.0

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Tidewater Inc.
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Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-21-4

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-09RE1
File ID: F081715A.seq-70.0000.txt
Sampled: 08/04/15 12:20
Prepared: 08/18/15 11:00
Analyzed: 08/18/15 14:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1610
Sequence: 1513423
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.2	1	J	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-21-3

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-10RE1
File ID: F081715A.seq-71.0000.txt
Sampled: 08/04/15 12:50
Prepared: 08/18/15 11:00
Analyzed: 08/18/15 15:11
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1610
Sequence: 1513423
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.6	1	J	EPA-314.0

9/7/15 9

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-21-2

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-11
File ID: F081715A.seq-15.0000.txt
Sampled: 08/04/15 13:30
Prepared: 08/17/15 19:00
Analyzed: 08/18/15 00:11
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1610
Sequence: 1513423
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.1	1	J	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

EB-7-080415

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-02
File ID: 150805 0118 CR6-009
Sampled: 08/04/15 06:40
Prepared: 08/05/15 01:18
Analyzed: 08/05/15 01:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0490
Sequence: 1512634
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-14-3

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-05
File ID: 150805 0118 CR6-010
Sampled: 08/04/15 08:40
Prepared: 08/05/15 01:18
Analyzed: 08/05/15 01:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0490
Sequence: 1512634
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-14-2

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-06
File ID: 150805 0118 CR6-011
Sampled: 08/04/15 09:20
Prepared: 08/05/15 01:18
Analyzed: 08/05/15 01:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0490
Sequence: 1512634
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

DUP-4-3Q15

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-07
File ID: 150805 0118 CR6-012
Sampled: 08/04/15 09:30
Prepared: 08/05/15 01:18
Analyzed: 08/05/15 01:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0490
Sequence: 1512634
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00075	1	J	EPA-7196

9/7/15 [illegible]

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-21-5

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-08
File ID: 150805 0118 CR6-015
Sampled: 08/04/15 11:45
Prepared: 08/05/15 01:18
Analyzed: 08/05/15 01:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0490
Sequence: 1512634
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0010	1	J	EPA-7196

8/7/15 4

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-21-4

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-09
File ID: 150805 0118 CR6-016
Sampled: 08/04/15 12:20
Prepared: 08/05/15 01:18
Analyzed: 08/05/15 01:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0490
Sequence: 1512634
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-21-3

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-10
File ID: 150805 0118 CR6-017
Sampled: 08/04/15 12:50
Prepared: 08/05/15 01:18
Analyzed: 08/05/15 01:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0490
Sequence: 1512634
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15 [illegible]

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/27/2015 3:58:36PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-21-2

Laboratory: BC Laboratories
SDG: 15-19097
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519097-11
File ID: 150805 0118 CR6-005
Sampled: 08/04/15 13:30
Prepared: 08/05/15 01:18
Analyzed: 08/05/15 01:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0490
Sequence: 1512634
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

LDC #: 34928D6

SDG #: 15-19097

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 9/2/15

Page: 1 of 1

Reviewer: JD

2nd Reviewer: [illegible]

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0)

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	8/4/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	EB=(1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(11,12)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	FD=(5,6)
X.	Sample result verification	A	Not reviewed for Level III validation.
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:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	EB-7-080415 Cr^{+6}	1519097-02	Water	08/04/15
2	MW-14-5	1519097-03	Water	08/04/15
3	MW-14-4**	1519097-04**	Water	08/04/15
4	MW-14-3 Cr^{+6}	1519097-05	Water	08/04/15
5	MW-14-2	1519097-06	Water	08/04/15
6	DUP-4-3Q15	1519097-07	Water	08/04/15
7	MW-21-5	1519097-08	Water	08/04/15
8	MW-21-4	1519097-09	Water	08/04/15
9	MW-21-3**	1519097-10**	Water	08/04/15
10	MW-21-2	1519097-11	Water	08/04/15
11	MW-21-2MS Cr^{+6} ClO_4	1519097-11MS	Water	08/04/15
12	MW-21-2MSD	1519097-11MSD	Water	08/04/15
13	MW-21-2DUP	1519097-11DUP	Water	08/04/15
14				
15				
16				

Notes:

LDC #: 34928D6

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: JSD
2nd Reviewer: OK

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 #: 34928SD0

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: CR

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 #: 34928D6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Parameter
1, 4-10	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
2-3	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 11-13	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC#:34928D6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics, Method See Cover

Analyte	Concentration		RPD
	5	6	
Perchlorate	4.9 (ug/L)	5.5 (ug/L)	12
Hexavalent Chromium	0.00070U (mg/L)	0.00075 (mg/L)	200

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\34928D6.wpd

LDC #: 34628D6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 6/25/15

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~~ mg/l)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.00	0	0.999950	0.999907	y*
		s2	0.002	0.002			
		s3	0.005	0.004			
		s4	0.025	0.02			
		s5	0.05	0.039			
		s6	0.1	0.077			
ICV Calibration verification	Cr^{+6}	Found 0.048 mg/L	True 0.05 mg/L		96%R	NR	y
(2) CCV 1:25 Calibration verification	Cr^{+6}	0.0522 mg/L	0.05 mg/L		104%R	104%R	y
ICV 13:59 Calibration verification	ClO_4	10 ug/L	10 ug/L		100%R	95.0%R	y*

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.

*Rounding

LDC #: 34928D6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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 1:19	Laboratory control sample	Cr+6	0.0509 mg/L	0.05 mg/L	102 %R	101 %R	Y*
MS 00:40	Matrix spike sample	ClO4	(SSR-SR) 10 ug/L	10.101 ug/L	99 %R	105 %R	Y*
DUP 00:20	Duplicate sample	ClO4	2.5 ug/L	3.75 ug/L	40 %RPD	6.10 %RPD	Y*

Comments: *Rounding

TOTCLC.6

LDC #: 34928D6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 3 ClO4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{A}{0.0008}$

Recalculation: $\frac{0.003}{0.0008} = 3.75$ ug/L

A = 0.003

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
	3	ClO4	4.3 ug/L	3.75 ug/L	Y*
	9	Cr+6	ND	ND	Y

Note: *Rounding

RECALC.6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 8, 2015

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-19343

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-8-080515	1519343-01	Water	08/05/15
EB-8-080515	1519343-02	Water	08/05/15
MW-11-4**	1519343-03**	Water	08/05/15
SB-2-080515	1519343-04	Water	08/05/15
MW-11-3	1519343-05	Water	08/05/15
MW-11-2	1519343-06	Water	08/05/15
MW-11-1	1519343-07	Water	08/05/15
MW-3-4	1519343-08	Water	08/05/15
MW-3-3	1519343-09	Water	08/05/15
MW-3-2	1519343-10	Water	08/05/15
MW-11-4MS	1519343-03MS	Water	08/05/15
MW-11-4MSD	1519343-03MSD	Water	08/05/15

**Indicates sample underwent Level IV review

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). 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) Method 524.2

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 evaluation, 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): 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.

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.

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

Instrument performance was checked 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.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% 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.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all 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 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/07/15	Bromomethane Hexachloroethane Methyl iodide	30.4 30.8 38.3	All samples in SDG 15-19343	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P

V. Laboratory Blanks

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

VI. Field Blanks

Sample TB-8-080515 was identified as a trip blank. No contaminants were found.

Sample EB-8-080515 was identified as an equipment blank. No contaminants were found.

Sample SB-2-080515 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

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) 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

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 continuing calibration %D, data were qualified as estimated 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 (UJ) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NASA JPL, 3Q2015
Volatiles - Data Qualification Summary - SDG 15-19343

Sample	Compound	Flag	A or P	Reason
TB-8-080515 EB-8-080515 MW-11-4** SB-2-080515 MW-11-3 MW-11-2 MW-11-1 MW-3-4 MW-3-3 MW-3-2	Bromomethane Hexachloroethane Methyl iodide	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-19343

No Sample Data Qualified in this SDG

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-8-080515

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-01	File ID:	07AUG44.D
Sampled:	08/05/15 05:50	Prepared:	08/07/15 09:56	Analyzed:	08/07/15 22:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-8-080515

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-01	File ID:	07AUG44.D
Sampled:	08/05/15 05:50	Prepared:	08/07/15 09:56	Analyzed:	08/07/15 22:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-8-080515

Laboratory:	BC Laboratories		SDG:	15-19343	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1519343-01		File ID:	07AUG44.D
Sampled:	08/05/15 05:50	Prepared:	08/07/15 09:56	Analyzed:	08/07/15 22:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.5500	95.5	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9200	99.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9400	99.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	199985	6.73	192303	6.73	
Chlorobenzene-d5 (IS)	69331	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	274961	7.52	266527	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-8-080515

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-02	File ID:	07AUG45.D
Sampled:	08/05/15 06:10	Prepared:	08/07/15 09:56	Analyzed:	08/07/15 23:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-8-080515

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-02	File ID:	07AUG45.D
Sampled:	08/05/15 06:10	Prepared:	08/07/15 09:56	Analyzed:	08/07/15 23:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15 [illegible]

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-8-080515

Laboratory:	BC Laboratories		SDG:	15-19343	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519343-02	File ID:	07AUG45.D
Sampled:	08/05/15 06:10	Prepared:	08/07/15 09:56	Analyzed:	08/07/15 23:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.200	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.010	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.290	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	196014	6.73	192303	6.73	
Chlorobenzene-d5 (IS)	69110	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	269664	7.52	266527	7.52	

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-4

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-03	File ID:	07AUG38.D
Sampled:	08/05/15 06:45	Prepared:	08/07/15 09:56	Analyzed:	08/07/15 20:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-4

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-03	File ID:	07AUG38.D
Sampled:	08/05/15 06:45	Prepared:	08/07/15 09:56	Analyzed:	08/07/15 20:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.20	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15 K

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-4

Laboratory:	BC Laboratories		SDG:	15-19343	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1519343-03		File ID:	07AUG38.D
Sampled:	08/05/15 06:45	Prepared:	08/07/15 09:56	Analyzed:	08/07/15 20:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.330	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9400	99.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.260	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190955	6.73	192303	6.73	
Chlorobenzene-d5 (IS)	64858	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	262819	7.52	266527	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-2-080515

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-04	File ID:	07AUG46.D
Sampled:	08/05/15 06:00	Prepared:	08/07/15 09:56	Analyzed:	08/07/15 23:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-2-080515

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-04	File ID:	07AUG46.D
Sampled:	08/05/15 06:00	Prepared:	08/07/15 09:56	Analyzed:	08/07/15 23:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-2-080515

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-04	File ID:	07AUG46.D
Sampled:	08/05/15 06:00	Prepared:	08/07/15 09:56	Analyzed:	08/07/15 23:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.160	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8200	98.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.100	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194865	6.73	192303	6.73	
Chlorobenzene-d5 (IS)	66617	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	273359	7.52	266527	7.52	

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-3

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-05	File ID:	07AUG47.D
Sampled:	08/05/15 07:40	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 00:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.18	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-3

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-05	File ID:	07AUG47.D
Sampled:	08/05/15 07:40	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 00:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.12	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.12	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-3

Laboratory:	BC Laboratories		SDG:	15-19343	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519343-05	File ID:	07AUG47.D
Sampled:	08/05/15 07:40	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 00:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9300	99.3	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8400	98.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7900	97.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	188305	6.73	192303	6.73	
Chlorobenzene-d5 (IS)	66698	9.73	68346	9.72	
1,4-Difluorobenzene (IS)	264329	7.52	266527	7.52	

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-2

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-06	File ID:	07AUG48.D
Sampled:	08/05/15 08:20	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 00:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-2

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-06	File ID:	07AUG48.D
Sampled:	08/05/15 08:20	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 00:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.080	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-2

Laboratory:	BC Laboratories		SDG:	15-19343	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519343-06	File ID:	07AUG48.D
Sampled:	08/05/15 08:20	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 00:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U NJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U NJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9500	99.5	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6400	96.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8400	98.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191946	6.73	192303	6.73	
Chlorobenzene-d5 (IS)	69274	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	267947	7.52	266527	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-1

Laboratory:	BC Laboratories		SDG:	15-19343	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1519343-07		File ID:	07AUG49.D
Sampled:	08/05/15 09:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 00:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-1

Laboratory:	BC Laboratories		SDG:	15-19343	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519343-07	File ID:	07AUG49.D
Sampled:	08/05/15 09:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 00:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.080	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-1

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-07	File ID:	07AUG49.D
Sampled:	08/05/15 09:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 00:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.7500	97.5	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6000	96.0	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.090	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	174741	6.73	192303	6.73	
Chlorobenzene-d5 (IS)	57404	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	248436	7.52	266527	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-4

Laboratory:	BC Laboratories		SDG:	15-19343	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1519343-08		File ID:	07AUG50.D
Sampled:	08/05/15 10:50	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 01:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U VJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.25	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-4

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-08	File ID:	07AUG50.D
Sampled:	08/05/15 10:50	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 01:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.21	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-4

Laboratory:	BC Laboratories		SDG:	15-19343	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519343-08	File ID:	07AUG50.D
Sampled:	08/05/15 10:50	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 01:13
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.8000	98.0	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.020	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.000	100	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	192877	6.73	192303	6.73	
Chlorobenzene-d5 (IS)	67884	9.73	68346	9.72	
1,4-Difluorobenzene (IS)	265547	7.52	266527	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-3

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-09	File ID:	07AUG51.D
Sampled:	08/05/15 11:20	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 01:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U U5
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.13	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15 ✗

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-3-3

Laboratory:	BC Laboratories		SDG:	15-19343	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519343-09	File ID:	07AUG51.D
Sampled:	08/05/15 11:20	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 01:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-3

Laboratory:	BC Laboratories		SDG:	15-19343	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519343-09	File ID:	07AUG51.D
Sampled:	08/05/15 11:20	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 01:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.6800	96.8	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.010	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.000	100	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190860	6.74	192303	6.73	
Chlorobenzene-d5 (IS)	64329	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	262680	7.52	266527	7.52	

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-2

Laboratory:	BC Laboratories		SDG:	15-19343	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519343-10	File ID:	07AUG52.D
Sampled:	08/05/15 12:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 01:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.24	J
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U US
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.9	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15 g

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-2

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-10	File ID:	07AUG52.D
Sampled:	08/05/15 12:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 01:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:48:07PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-2

Laboratory:	BC Laboratories			SDG:	15-19343
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519343-10	File ID:	07AUG52.D
Sampled:	08/05/15 12:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 01:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U US
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U US
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.320	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.110	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.390	104	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190691	6.73	192303	6.73	
Chlorobenzene-d5 (IS)	65762	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	261161	7.52	266527	7.52	

9/7/15 Q

LDC #: 34928E1

SDG #: 15-19343

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 9/4/15

Page: 1 of 2

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

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 ≤ 20%, r² 1 CV ≤ 30%
IV.	Continuing calibration	SW	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 EB = 2 SB = 4
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A N	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Target compound identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III 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 Level IV validation

	Client ID	Lab ID	Matrix	Date
1	TB-8-080515	1519343-01	Water	08/05/15
2	EB-8-080515	1519343-02	Water	08/05/15
3	MW-11-4**	1519343-03**	Water	08/05/15
4	SB-2-080515	1519343-04	Water	08/05/15
5	MW-11-3	1519343-05	Water	08/05/15
6	MW-11-2	1519343-06	Water	08/05/15
7	MW-11-1	1519343-07	Water	08/05/15
8	MW-3-4	1519343-08	Water	08/05/15
9	MW-3-3	1519343-09	Water	08/05/15
10	MW-3-2	1519343-10	Water	08/05/15
11	MW-11-4MS	1519343-03MS	Water	08/05/15
12	MW-11-4MSD	1519343-03MSD	Water	08/05/15
13				

LDC #: 34928E1

SDG #: 15-19343

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 9/4/15

Reviewer: KR

2nd Reviewer: ✓

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				
17				

Notes:

T	BYH0625-BLK1						

LDC #: 34928E1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: [illegible]

Method: Volatiles (EPA Method 524.2)

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				
Were the BFB performance results 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 deviations (%RSD) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %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?			✓	
VII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	✓			
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 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?	✓			

LDC #: 34928B2

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within +/-40% from the associated calibration standard?	✓			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	✓			
XI. 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?	✓			
XII. Compound quantitation/RLs				
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. Tentatively identified compounds (TICs)				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	✓			
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

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. Methyl iodide
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. Pentachloroethane
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. Hexachloroethane
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 34928E1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

METHOD: GC/MS VOA (EPA Method 524.2)
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 all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	8/7/15	CCV-07AUG34/35	B	30.4	All	J/UJ/P (ND)
			Y1	30.8		
			W1	38.3		↓

CONCAL.1S5

LDC #: 34928E1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

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

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/30/2015	1,1-Dichloroethene (IS1)	0.697237	0.697237	0.6682290	0.6682290	7.754823	7.754809
	MS-V5		Trichloroethene (IS2)	0.343890	0.343890	0.3375275	0.3375275	7.469184	7.469187
			1,1,2,2-Tetrachloethane	0.583603	0.583603	0.5832449	0.5832449	6.534171	6.534179

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 #: 34928E1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: a

METHOD: GC/MS VOA (EPA Method 524.2)

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 = $(A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 32/80 std)	Recalculated RRF (RRF 32/80 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/30/2015	Allyl chloride (IS1)	0.633362	0.633362	0.6620764	0.6620764	12.922551	12.922551
	MS-V5		Methyl methacrylate (IS	0.083845	0.083845	0.08494876	0.08494876	8.605336	8.605336
			Pentachloroethane (IS3	0.572308	0.572308	0.5611418	0.5611418	7.802302	7.802317

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#: 34928E1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

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

METHOD: GC/MS VOA (EPA Method 524.2)

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 = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	07AUG34	8/7/2015	1,1-Dichloroethene (IS1)	0.668229	0.6072568	0.6072568	9.1	9.1
			Trichloroethene (IS2)	0.337528	0.3145925	0.3145925	6.8	6.8
			1,1,2,2-Tetrachloethane	0.583245	0.5661093	0.5661093	2.9	2.9
2	07AUG35	8/7/2015	Allyl chloride (IS1)	0.662076	0.6308859	0.6308859	4.7	4.7
			Methyl methacrylate (IS2	0.084949	0.08556169	0.08556169	0.7	0.7
			Pentachloroethane (IS3	0.561142	0.4684619	0.4684619	16.5	16.5

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 #: 34928E1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: BR

2nd reviewer: ✓

METHOD: GC/MS VOA (EPA Method 524.2)

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: 3

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.00	9.94	99.4	99.4	0
Bromofluorobenzene	↓	10.33	103	103	0
1,2-Dichlorobenzene-d4	↓	10.26	103	103	0
Dibromofluoromethane					

Sample ID:

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

Sample ID:

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

Sample ID:

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

LDC#: 34928E1

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: BR

2nd Reviewer d

METHOD: GC/MS VOA (EPA Method 524.2)

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

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

RPD = [MSC- MSDC] * 2) / (MSC + MSDC)*100

MSC = Matrix spike percent recovery

MSDC = Matrix spike duplicate percent recovery

MS/MSD samples: 11/12

Compound	Spike Added (µg/L)		Sample Conc. (µg/L)	Spiked Sample Concentration (µg/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
[redacted]	MS	MSD	------	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
1,1-Dichloroethene	25.00	25.00	0	24.510	25.300	98.0%	98.0%	101%	101%	3.17%	3.17%
Trichloroethene	25.00	25.00	0	25.260	25.830	101%	101%	103%	103%	2.23%	2.23%
Benzene	25.00	25.00	0	25.430	26.020	102%	102%	104%	104%	2.29%	2.29%
Toluene	25.00	25.00	0	24.670	25.310	98.7%	98.7%	101%	101%	2.56%	2.56%
Chlorobenzene	25.00	25.00	0	23.120	23.940	92.5%	92.5%	95.8%	95.8%	3.48%	3.48%

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 #: 34928E)

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: BR
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

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: BYH0625-BS1

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	25.000		25.240		101	101				
Trichloroethene	↓		24.640		98.6	98.6				
Benzene			25.430		102	102				
Toluene			23.980		95.8	95.8				
Chlorobenzene			22.850		91.4	91.4				

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 #: 34928E1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: BR
2nd reviewer: X

METHOD: GC/MS VOA (EPA Method 524.2)

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:

FF = 0.20

Sample I.D. 3, FF:

Conc. = $\frac{(4848)(10)(\quad)}{(64858)(3.72644)(\quad)}$

= 0.200586978 ug/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 3, 2015

Parameters: Chromium

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-19343

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-8-080515	1519343-02	Water	08/05/15
SB-2-080515	1519343-04	Water	08/05/15
MW-11-3	1519343-05	Water	08/05/15
MW-11-2	1519343-06	Water	08/05/15
MW-11-1	1519343-07	Water	08/05/15
MW-3-4	1519343-08	Water	08/05/15
MW-3-3	1519343-09	Water	08/05/15
MW-3-2	1519343-10	Water	08/05/15
EB-8-080515MS	1519343-02MS	Water	08/05/15
EB-8-080515MSD	1519343-02MSD	Water	08/05/15
EB-8-080515DUP	1519343-02DUP	Water	08/05/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Chromium by Environmental Protection Agency (EPA) Method 200.8

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): 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.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected 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 or analyte 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.

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% with the following exceptions:

Date	Isotope	Analyte	%RSD	Associated Samples	Flag	A or P
08/20/15	Magnesium^{24}	Chromium	12.0	All samples in SDG 15-19343	J (all detects) UJ (all non-detects)	P
08/20/15	Indium^{115}	Chromium	17.1	All samples in SDG 15-19343	J (all detects) UJ (all non-detects)	P

III. Instrument Calibration

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

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

ICP interference check sample analyses were not required by the method.

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	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Chromium	0.68200 ug/L	All samples in SDG 15-19343

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 (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-8-080515	Chromium	0.70 ug/L	0.70U ug/L
SB-2-080515	Chromium	0.68 ug/L	0.68U ug/L
MW-11-3	Chromium	0.93 ug/L	0.93U ug/L
MW-11-1	Chromium	0.60 ug/L	0.60U ug/L
MW-3-3	Chromium	2.8 ug/L	2.8U ug/L
MW-3-2	Chromium	0.79 ug/L	0.79U ug/L

VI. Field Blanks

Sample EB-8-080515 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
EB-8-080515	Chromium	0.70

Sample SB-2-080515 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
SB-2-080515	Chromium	0.68

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. Duplicate Sample Analysis

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

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

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Raw data were not reviewed for Level III validation.

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 method. No results were rejected in this SDG.

Due to ICPMS tune %RSD, data were qualified as estimated in eight samples.

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

NASA JPL, 3Q2015
Chromium - Data Qualification Summary - SDG 15-19343

Sample	Analyte	Flag	A or P	Reason
EB-8-080515 SB-2-080515 MW-11-3 MW-11-2 MW-11-1 MW-3-4 MW-3-3 MW-3-2	Chromium	J (all detects) UJ (all non-detects)	P	ICPMS Tune (%RSD)

NASA JPL, 3Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-19343

Sample	Analyte	Modified Final Concentration	A or P
EB-8-080515	Chromium	0.70U ug/L	A
SB-2-080515	Chromium	0.68U ug/L	A
MW-11-3	Chromium	0.93U ug/L	A
MW-11-1	Chromium	0.60U ug/L	A
MW-3-3	Chromium	2.8U ug/L	A
MW-3-2	Chromium	0.79U ug/L	A

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:49:54PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-8-080515

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-02
File ID: PE_EL2_150820-101
Sampled: 08/05/15 06:10
Prepared: 08/11/15 11:30
Analyzed: 08/20/15 18:17
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0862
Sequence: 1513657
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.70	1	J U5	EPA-200.8

9/9/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:49:54PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

SB-2-080515

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-04
File ID: PE_EL2_150820-107
Sampled: 08/05/15 06:00
Prepared: 08/11/15 11:30
Analyzed: 08/20/15 18:38
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0862
Sequence: 1513657
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.68	1	J U5	EPA-200.8

9/9/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:49:54PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-11-3

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-05
File ID: PE_EL2_150820-108
Sampled: 08/05/15 07:40
Prepared: 08/11/15 11:30
Analyzed: 08/20/15 18:41
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0862
Sequence: 1513657
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.93	1	J UJ	EPA-200.8

9/9/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:49:54PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-11-2

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-06
File ID: PE_EL2_150820-113
Sampled: 08/05/15 08:20
Prepared: 08/11/15 11:30
Analyzed: 08/20/15 19:05
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0862
Sequence: 1513657
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U U5	EPA-200.8

9/9/15 Q

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:49:54PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-11-1

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-07
File ID: PE_EL2_150820-114
Sampled: 08/05/15 09:00
Prepared: 08/11/15 11:30
Analyzed: 08/20/15 19:08
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0862
Sequence: 1513657
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.60	1	J UJ	EPA-200.8

9/9/15 9

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:49:54PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-3-4

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-08
File ID: PE_EL2_150820-115
Sampled: 08/05/15 10:50
Prepared: 08/11/15 11:30
Analyzed: 08/20/15 19:12
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0862
Sequence: 1513657
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.9	1	J	EPA-200.8

9/9/15 Q

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:49:54PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-3-3

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-09
File ID: PE_EL2_150820-116
Sampled: 08/05/15 11:20
Prepared: 08/11/15 11:30
Analyzed: 08/20/15 19:15
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0862
Sequence: 1513657
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.8	1	J ~~U~~	EPA-200.8

9/9/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:49:54PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-3-2

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-10
File ID: PE_EL2_150820-117
Sampled: 08/05/15 12:00
Prepared: 08/11/15 11:30
Analyzed: 08/20/15 19:19
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH0862
Sequence: 1513657
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.79	1	J UJ	EPA-200.8

9/9/15

LDC #: 34928E4a

SDG #: 15-19343

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 9/2/15

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: Chromium (EPA Method 200.8)

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	8/5/15
II.	ICP/MS Tune	SW	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not Required
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB=(1) SB=(2)
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(9,10)
VIII.	Duplicate sample analysis	A	DUP
IX.	ICP Serial Dilution	A	
X.	Laboratory control samples	A	LCS
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	EB-8-080515	1519343-02	Water	08/05/15
2	SB-2-080515	1519343-04	Water	08/05/15
3	MW-11-3	1519343-05	Water	08/05/15
4	MW-11-2	1519343-06	Water	08/05/15
5	MW-11-1	1519343-07	Water	08/05/15
6	MW-3-4	1519343-08	Water	08/05/15
7	MW-3-3	1519343-09	Water	08/05/15
8	MW-3-2	1519343-10	Water	08/05/15
9	EB-8-080515MS	1519343-02MS	Water	08/05/15
10	EB-8-080515MSD	1519343-02MSD	Water	08/05/15
11	EB-8-080515DUP	1519343-02DUP	Water	08/05/15
12				
13				
14				

Notes:

LDC #: 34928E4a

VALIDATION FINDINGS WORKSHEET
Tune (ICP-MS)

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

METHOD: Metals (EPA SW846 Method6020)

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

Y N N/A Were all isotopes in the tuning solution mass resolution within 0.1amu?

Y N N/A Were %RSD of isotopes in the tuning solution ≤5%?

#	Date	Isotope	Associated Metals	Mass (Limits)	RSD (≤5%)	Associated Samples	Qualifications
	08/20/15	Mg^{24} 24.0	Cr		12.0	All	J/UJ/P (det/nd)
		In^{115} 114.9	Cr		17.1		J/UJ/P (det/nd)

LDC #: 34928E4a

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: ____
Sample Concentration units, unless otherwise noted: ug/L Associated Samples: All

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	1	2	3	5	7	8				
Cr			0.68200	3.41	0.70	0.68	0.93	0.60	2.8	0.79				

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 #: 34928E4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?

Sample: 1 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

Analyte	Concentration Units (ug/L)
Cr	0.70

Sample: 2 Field Blank / Trip Blank / Rinsate / Other SB (circle one)

Analyte	Concentration Units (ug/L)
Cr	0.68

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 3, 2015

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-19343

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-8-080515	1519343-02	Water	08/05/15
MW-11-4**	1519343-03**	Water	08/05/15
SB-2-080515	1519343-04	Water	08/05/15
MW-11-3	1519343-05	Water	08/05/15
MW-11-2	1519343-06	Water	08/05/15
MW-11-1	1519343-07	Water	08/05/15
MW-3-4	1519343-08	Water	08/05/15
MW-3-3	1519343-09	Water	08/05/15
MW-3-2	1519343-10	Water	08/05/15
EB-8-080515MS	1519343-02MS	Water	08/05/15
EB-8-080515MSD	1519343-02MSD	Water	08/05/15
EB-8-080515DUP	1519343-02DUP	Water	08/05/15
MW-11-4MS	1519343-03MS	Water	08/05/15
MW-11-4MSD	1519343-03MSD	Water	08/05/15
MW-11-4DUP	1519343-03DUP	Water	08/05/15
MW-11-1MS	1519343-07MS	Water	08/05/15
MW-11-1MSD	1519343-07MSD	Water	08/05/15
MW-11-1DUP	1519343-07DUP	Water	08/05/15

**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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA SW 846 Method 7196
Nitrite as Nitrogen by EPA Method 353.2
Orthophosphate as Phosphorus by EPA Method 365.1
Perchlorate by EPA Method 314.0

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): 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.

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.

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

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

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

V. Field Blanks

Sample EB-8-080515 was identified as an equipment blank. No contaminants were found.

Sample SB-2-080515 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. Duplicates

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 methods. 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 methods. 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.

NASA JPL, 3Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-19343

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-19343

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 5:21:35PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-300.0

MW-11-1

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-07
File ID: B080515A.seq-42
Sampled: 08/05/15 09:00
Prepared: 08/06/15 09:30
Analyzed: 08/06/15 10:53
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0432
Sequence: 1513437
Calibration: UNASSIGNED
Instrument: IC2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	17	1		EPA-300.0
14797-55-8	Nitrate as N	0.28	1		EPA-300.0
14808-79-8	Sulfate	36	1		EPA-300.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 5:21:35PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-11-1

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-07
File ID: 150806 0858 NO2-029
Sampled: 08/05/15 09:00
Prepared: 08/06/15 08:58
Analyzed: 08/06/15 08:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0502
Sequence: 1512792
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.013	1	J	EPA-353.2

9/1/15 ✓

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 5:21:35PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-365.1

MW-11-1

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-07
File ID: 150806 0815 PO4-019
Sampled: 08/05/15 09:00
Prepared: 08/06/15 08:15
Analyzed: 08/06/15 08:31
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0504
Sequence: 1512794
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.018	1	J	EPA-365.1

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 5:21:35PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-8-080515

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-02
File ID: 150806 0023 CR6-005
Sampled: 08/05/15 06:10
Prepared: 08/06/15 00:23
Analyzed: 08/06/15 00:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0505
Sequence: 1512688
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 5:21:35PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

SB-2-080515

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-04
File ID: 150806 0023 CR6-009
Sampled: 08/05/15 06:00
Prepared: 08/06/15 00:23
Analyzed: 08/06/15 00:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0505
Sequence: 1512688
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 5:21:35PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-11-3

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-05
File ID: 150806 0023 CR6-010
Sampled: 08/05/15 07:40
Prepared: 08/06/15 00:23
Analyzed: 08/06/15 00:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0505
Sequence: 1512688
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 5:21:35PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-11-2

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-06
File ID: 150806 0023 CR6-011
Sampled: 08/05/15 08:20
Prepared: 08/06/15 00:23
Analyzed: 08/06/15 00:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0505
Sequence: 1512688
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 5:21:35PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-11-1

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-07
File ID: 150806 0023 CR6-012
Sampled: 08/05/15 09:00
Prepared: 08/06/15 00:23
Analyzed: 08/06/15 00:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0505
Sequence: 1512688
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15 9

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 5:21:35PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-3-4

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-08
File ID: 150806 0746 CR6-003
Sampled: 08/05/15 10:50
Prepared: 08/06/15 07:46
Analyzed: 08/06/15 07:46
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0505
Sequence: 1512688
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 5:21:35PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-3-3

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-09
File ID: 150806 0746 CR6-004
Sampled: 08/05/15 11:20
Prepared: 08/06/15 07:46
Analyzed: 08/06/15 07:46
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0505
Sequence: 1512688
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 5:21:35PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-3-2

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-10
File ID: 150806 0023 CR6-017
Sampled: 08/05/15 12:00
Prepared: 08/06/15 00:23
Analyzed: 08/06/15 00:26
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0505
Sequence: 1512688
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00089	1	J	EPA-7196

9/7/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:46:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-8-080515

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-02
File ID: F081915A.seq-12.0000.txt
Sampled: 08/05/15 06:10
Prepared: 08/19/15 12:00
Analyzed: 08/19/15 15:54
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1696
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:46:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-11-4

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-03
File ID: F081915A.seq-8.0000.txt
Sampled: 08/05/15 06:45
Prepared: 08/19/15 12:00
Analyzed: 08/19/15 14:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1696
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15 q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:46:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

SB-2-080515

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-04
File ID: F081915A.seq-13.0000.txt
Sampled: 08/05/15 06:00
Prepared: 08/19/15 12:00
Analyzed: 08/19/15 16:08
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1696
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:46:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-11-3

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-05
File ID: F081915A.seq-16.0000.txt
Sampled: 08/05/15 07:40
Prepared: 08/19/15 12:00
Analyzed: 08/19/15 16:51
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1696
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:46:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-11-2

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-06
File ID: F081915A.seq-17.0000.txt
Sampled: 08/05/15 08:20
Prepared: 08/19/15 12:00
Analyzed: 08/19/15 17:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1696
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:46:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-11-1

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-07
File ID: F081915A.seq-18.0000.txt
Sampled: 08/05/15 09:00
Prepared: 08/19/15 12:00
Analyzed: 08/19/15 17:20
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1696
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:46:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-3-4

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-08
File ID: F081915A.seq-19.0000.txt
Sampled: 08/05/15 10:50
Prepared: 08/19/15 12:00
Analyzed: 08/19/15 17:34
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1696
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:46:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-3-3

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-09
File ID: F081915A.seq-20.0000.txt
Sampled: 08/05/15 11:20
Prepared: 08/19/15 12:00
Analyzed: 08/19/15 17:48
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1696
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.5	1	J	EPA-314.0

9/7/15 [illegible]

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:46:20PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-3-2

Laboratory: BC Laboratories
SDG: 15-19343
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519343-10RE2
File ID: F082015.seq-51.0000.txt
Sampled: 08/05/15 12:00
Prepared: 08/20/15 18:00
Analyzed: 08/21/15 02:42
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1959
Sequence: 1513627
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	37	5	D	EPA-314.0

9/7/15

LDC #: 34928E6
SDG #: 15-19343
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 9/2/15
Page: 1 of 2
Reviewer: SD
2nd Reviewer: [illegible]

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Hexavalent Chromium (EPA SW846 Method 7196), Nitrite-N (EPA Method 353.2), ortho-Phosphate (EPA Method 365.1), Perchlorate (EPA Method 314.0)
-P

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	8/5/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	EB=(1) SB=(3)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MSD=(10,11)(13,14)(16,17)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Sample result verification	A	Not reviewed for Level III validation.
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:

** Indicates sample underwent Level IV validation

	Client ID		Lab ID	Matrix	Date
1	EB-8-080515	Cr^{+6}	1519343-02	Water	08/05/15
2	MW-11-4**		1519343-03**	Water	08/05/15
3	SB-2-080515	Cr^{+6}	1519343-04	Water	08/05/15
4	MW-11-3	↓	1519343-05	Water	08/05/15
5	MW-11-2	↓	1519343-06	Water	08/05/15
6	MW-11-1	Cr^{+6} OPO_4, NO_2, 300.0	1519343-07	Water	08/05/15
7	MW-3-4	Cr^{+6}	1519343-08	Water	08/05/15
8	MW-3-3	↓	1519343-09	Water	08/05/15
9	MW-3-2	↓	1519343-10	Water	08/05/15
10	EB-8-080515MS	Cr^{+6}	1519343-02MS	Water	08/05/15
11	EB-8-080515MSD	↓	1519343-02MSD	Water	08/05/15
12	EB-8-080515DUP	↓	1519343-02DUP	Water	08/05/15
13	MW-11-4MS	ClO_4	1519343-03MS	Water	08/05/15
14	MW-11-4MSD	↓	1519343-03MSD	Water	08/05/15
15	MW-11-4DUP	↓	1519343-03DUP	Water	08/05/15
16	MW-11-1MS	OPO_4 NO_2-N	1519343-07MS	Water	08/05/15
17	MW-11-1MSD	↓ ↓	1519343-07MSD	Water	08/05/15

LDC #: 34928E6

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

SDG #: 15-19343

Laboratory: BC Laboratories, Inc.

Date: 9/2/15

Reviewer: JD

2nd Reviewer: A

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Hexavalent Chromium (EPA SW846 Method 7196), Nitrite-N (EPA Method 353.2), ortho-Phosphate (EPA Method 365.1),Perchlorate (EPA Method 314.0)

	Client ID	Lab ID	Matrix	Date
18	MW-11-1DUP OPO4 NO2	1519343-07DUP	Water	08/05/15
19				
20				
21				
22				
23				

Notes:

LDC #: 34928E0

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
2nd Reviewer: [illegible]

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 #: 34928E60

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: [illegible]

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 #: 34928EV6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Parameter
1, 3-5, 7-9	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
2	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
6	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 10-12	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 13-15	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 16-18	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 34928E6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of ClO_4 was recalculated. Calibration date: 8/17/15

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	ClO_4	s1	0.00	0	*0.999384*	0.997934	Y*
		s2	2	0.002			
		s3	4	0.003			
		s4	6	0.005			
		s5	10	0.008			
		s6	20	0.016			
ICV 13:30 Calibration verification		Found 10ug/L	True 10ug/L		100%R	95.0%R	Y*
CCV 16:22 Calibration verification		10ug/L	10ug/L		100%R	98.4%R	Y*
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.

*Rounding

LDC #: 34928EQ

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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 14:42	Laboratory control sample	Cl04	10 ug/L	10 ug/L	100%R	104%R	Y*
MS 15:25	Matrix spike sample	↓	(SSR-SR) 11.25 ug/L	10.101 ug/L	111%R	107%R	Y*
DUP 15:11	Duplicate sample	↓	ND	ND	0%RPD	NR	Y

Comments: *Boundary

TOTCLC.6

LDC #: 34928E6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 (2) ClO4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

ND

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
	2	ClO4	ND	ND	Y

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 8, 2015

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-19491

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-9-080615	1519491-01	Water	08/06/15
MW-13	1519491-02	Water	08/06/15
DUP-7-3Q15	1519491-03	Water	08/06/15
MW-10	1519491-04	Water	08/06/15
MW-5	1519491-05	Water	08/06/15
DUP-5-3Q15	1519491-06	Water	08/06/15
MW-6**	1519491-07**	Water	08/06/15
MW-8	1519491-08	Water	08/06/15
DUP-6-3Q15	1519491-09	Water	08/06/15
MW-16	1519491-11	Water	08/06/15
MW-7	1519491-12	Water	08/06/15
TB-10-080615	1519491-13	Water	08/06/15

**Indicates sample underwent Level IV review

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). 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) Method 524.2

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 evaluation, 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): 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.

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.

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

Instrument performance was checked 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.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% 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.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all 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 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/07/15	Bromomethane Hexachloroethane Methyl iodide	30.4 30.8 38.3	TB-9-080615 MW-13 DUP-7-3Q15 MW-10 MW-5 DUP-5-3Q15 MW-6** MW-8 DUP-6-3Q15 MW-16	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
08/08/15	Bromomethane Methyl iodide	61.0 46.1	MW-7 TB-10-080615	UJ (all non-detects) UJ (all non-detects)	P

V. Laboratory Blanks

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

VI. Field Blanks

Samples TB-9-080615 and TB-10-080615 were identified as trip blanks. 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) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-13 and DUP-7-3Q15, samples MW-5 and DUP-5-3Q15, and samples MW-8 and DUP-6-3Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-13	DUP-7-3Q15	
Chloroform	1.7	1.6	6
Tetrachloroethene	0.29	0.31	7
Trichloroethene	0.085U	0.090	200

Compound	Concentration (ug/L)		RPD
	MW-5	DUP-5-3Q15	
Chloroform	0.42	0.55	27

Compound	Concentration (ug/L)		RPD
	MW-5	DUP-5-3Q15	
Tetrachloroethene	0.33	0.31	6
Trichloroethene	1.6	1.6	0

Compound	Concentration (ug/L)		RPD
	MW-8	DUP-6-3Q15	
Bromodichloromethane	0.38	0.43	12
Chloroform	4.9	4.7	4
Trichloroethene	0.10	0.10	0
Trichlorofluoromethane	0.17	0.17	0

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 continuing calibration %D, data were qualified as estimated in twelve 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 (UJ) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NASA JPL, 3Q2015
Volatiles - Data Qualification Summary - SDG 15-19491

Sample	Compound	Flag	A or P	Reason
TB-9-080615 MW-13 DUP-7-3Q15 MW-10 MW-5 DUP-5-3Q15 MW-6** MW-8 DUP-6-3Q15 MW-16	Bromomethane Hexachloroethane Methyl iodide	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)
MW-7 TB-10-080615	Bromomethane Methyl iodide	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-19491

No Sample Data Qualified in this SDG

BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-9-080615

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-01	File ID:	07AUG53.D
Sampled:	08/06/15 07:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 02:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-9-080615

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-01	File ID:	07AUG53.D
Sampled:	08/06/15 07:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 02:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15 q

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-9-080615

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-01	File ID:	07AUG53.D
Sampled:	08/06/15 07:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 02:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9200	99.2	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9300	99.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9800	99.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194083	6.74	192303	6.73	
Chlorobenzene-d5 (IS)	67214	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	272616	7.52	266527	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

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Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-13

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-02	File ID:	07AUG54.D
Sampled:	08/06/15 08:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 02:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.7	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-13

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-02	File ID:	07AUG54.D
Sampled:	08/06/15 08:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 02:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.29	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-13

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-02	File ID:	07AUG54.D
Sampled:	08/06/15 08:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 02:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.100	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8200	98.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.590	106	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	192170	6.73	192303	6.73	
Chlorobenzene-d5 (IS)	64163	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	271194	7.52	266527	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-7-3Q15

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-03	File ID:	07AUG55.D
Sampled:	08/06/15 08:10	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 03:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.6	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-7-3Q15

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-03	File ID:	07AUG55.D
Sampled:	08/06/15 08:10	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 03:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.31	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.090	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-7-3Q15

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-03	File ID:	07AUG55.D
Sampled:	08/06/15 08:10	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 03:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.370	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9300	99.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.210	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191575	6.74	192303	6.73	
Chlorobenzene-d5 (IS)	65781	9.73	68346	9.72	
1,4-Difluorobenzene (IS)	268512	7.52	266527	7.52	

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Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-04	File ID:	07AUG56.D
Sampled:	08/06/15 09:40	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 03:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U US
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.80	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.23	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.33	J
156-60-5	trans-1,2-Dichloroethene	1	0.43	J
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-04	File ID:	07AUG56.D
Sampled:	08/06/15 09:40	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 03:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.81	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	8.0	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories		SDG:	15-19491	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1519491-04		File ID:	07AUG56.D
Sampled:	08/06/15 09:40	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 03:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.070	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8800	98.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9600	99.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	188412	6.74	192303	6.73	
Chlorobenzene-d5 (IS)	67036	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	265449	7.52	266527	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-05	File ID:	07AUG57.D
Sampled:	08/06/15 10:47	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 03:53
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.42	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-05	File ID:	07AUG57.D
Sampled:	08/06/15 10:47	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 03:53
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.33	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.6	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-05	File ID:	07AUG57.D
Sampled:	08/06/15 10:47	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 03:53
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.530	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.090	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.620	106	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	192424	6.73	192303	6.73	
Chlorobenzene-d5 (IS)	65712	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	265416	7.52	266527	7.52	

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BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-5-3Q15

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-06	File ID:	07AUG58.D
Sampled:	08/06/15 10:57	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 04:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.55	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-5-3Q15

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-06	File ID:	07AUG58.D
Sampled:	08/06/15 10:57	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 04:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.31	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.6	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-5-3Q15

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-06	File ID:	07AUG58.D
Sampled:	08/06/15 10:57	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 04:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.470	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.200	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.340	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194835	6.74	192303	6.73	
Chlorobenzene-d5 (IS)	67556	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	268516	7.52	266527	7.52	

9/7/15 q

BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	15-19491	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519491-07	File ID:	07AUG59.D
Sampled:	08/06/15 11:55	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 04:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.72	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.19	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.090	J
156-60-5	trans-1,2-Dichloroethene	1	0.20	J
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15 ✗

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-07	File ID:	07AUG59.D
Sampled:	08/06/15 11:55	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 04:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.89	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	3.5	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	15-19491	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519491-07	File ID:	07AUG59.D
Sampled:	08/06/15 11:55	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 04:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9200	99.2	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7900	97.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8200	98.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194174	6.74	192303	6.73	
Chlorobenzene-d5 (IS)	68407	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	271557	7.52	266527	7.52	

9/7/15 [illegible]

BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-8

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-08	File ID:	07AUG60.D
Sampled:	08/06/15 09:35	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 05:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.38	J
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	4.9	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-8

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-08	File ID:	07AUG60.D
Sampled:	08/06/15 09:35	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 05:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.10	J
75-69-4	Trichlorofluoromethane	1	0.17	J
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-8

Laboratory:	BC Laboratories		SDG:	15-19491	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519491-08	File ID:	07AUG60.D
Sampled:	08/06/15 09:35	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 05:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.350	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9600	99.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.140	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	187899	6.74	192303	6.73	
Chlorobenzene-d5 (IS)	66731	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	270562	7.51	266527	7.52	

9/7/15 [illegible]

BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-6-3Q15

Laboratory:	BC Laboratories		SDG:	15-19491	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1519491-09		File ID:	07AUG61.D
Sampled:	08/06/15 09:45	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 05:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.43	J
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	4.7	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-6-3Q15

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-09	File ID:	07AUG61.D
Sampled:	08/06/15 09:45	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 05:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.10	J
75-69-4	Trichlorofluoromethane	1	0.17	J
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15 Q

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-6-3Q15

Laboratory:	BC Laboratories		SDG:	15-19491	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1519491-09		File ID:	07AUG61.D
Sampled:	08/06/15 09:45	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 05:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9100	99.1	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.080	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7400	97.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	200334	6.74	192303	6.73	
Chlorobenzene-d5 (IS)	68315	9.72	68346	9.72	
1,4-Difluorobenzene (IS)	265871	7.52	266527	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-11	File ID:	07AUG76.D
Sampled:	08/06/15 11:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 11:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.89	
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U US
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.80	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15 ✗

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-11	File ID:	07AUG76.D
Sampled:	08/06/15 11:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 11:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0625	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-11	File ID:	07AUG76.D
Sampled:	08/06/15 11:00	Prepared:	08/07/15 09:56	Analyzed:	08/08/15 11:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYH0625 Sequence: 1512663 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U UJ
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.7500	97.5	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6300	96.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.320	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	197147	6.74	187900	6.74	
Chlorobenzene-d5 (IS)	67108	9.72	68562	9.72	
1,4-Difluorobenzene (IS)	279378	7.52	267918	7.52	

9/7/15 ✗

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-7

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-12	File ID:	07AUG77.D
Sampled:	08/06/15 13:20	Prepared:	08/07/15 07:00	Analyzed:	08/08/15 11:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0491	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.10	J
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.9	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15 ✗

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-7

Laboratory:	BC Laboratories		SDG:	15-19491	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1519491-12	File ID:	07AUG77.D
Sampled:	08/06/15 13:20	Prepared:	08/07/15 07:00	Analyzed:	08/08/15 11:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0491	Sequence: 1512663	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/7/15 q

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-7

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-12	File ID:	07AUG77.D
Sampled:	08/06/15 13:20	Prepared:	08/07/15 07:00	Analyzed:	08/08/15 11:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0491	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.490	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.040	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.030	100	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	193360	6.73	187900	6.74	
Chlorobenzene-d5 (IS)	68640	9.72	68562	9.72	
1,4-Difluorobenzene (IS)	266506	7.52	267918	7.52	

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-10-080615

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-13	File ID:	07AUG75.D
Sampled:	08/06/15 09:00	Prepared:	08/07/15 07:00	Analyzed:	08/08/15 10:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0491	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-10-080615

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-13	File ID:	07AUG75.D
Sampled:	08/06/15 09:00	Prepared:	08/07/15 07:00	Analyzed:	08/08/15 10:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0491	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:51:21PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-10-080615

Laboratory:	BC Laboratories			SDG:	15-19491
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1519491-13	File ID:	07AUG75.D
Sampled:	08/06/15 09:00	Prepared:	08/07/15 07:00	Analyzed:	08/08/15 10:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYH0491	Sequence:	1512663	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.080	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.150	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.580	106	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	195964	6.73	187900	6.74	
Chlorobenzene-d5 (IS)	66755	9.72	68562	9.72	
1,4-Difluorobenzene (IS)	271976	7.52	267918	7.52	

9/7/15

LDC #: 34928F1

SDG #: 15-19491

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 9/4/15

Page: 1 of 2

Reviewer: Br

2nd Reviewer: CL

METHOD: GC/MS Volatiles (EPA Method 524.2)

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≤20%, r² ICV≤30%
IV.	Continuing calibration	SW	CCV≤30%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1, 12
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	Client spec.
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	FD = 2+3, 5+6, 8+9
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Target compound identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III 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 Level IV validation

	Client ID	Lab ID	Matrix	Date
1	TB-9-080615	1519491-01	Water	08/06/15
2	MW-13	1519491-02	Water	08/06/15
3	DUP-7-3Q15	1519491-03	Water	08/06/15
4	MW-10	1519491-04	Water	08/06/15
5	MW-5	1519491-05	Water	08/06/15
6	DUP-5-3Q15	1519491-06	Water	08/06/15
7	MW-6**	1519491-07**	Water	08/06/15
8	MW-8	1519491-08	Water	08/06/15
9	DUP-6-3Q15	1519491-09	Water	08/06/15
10	MW-16	1519491-11	Water	08/06/15
11	MW-7	1519491-12	Water	08/06/15
12	TB-10-080615	1519491-13	Water	08/06/15
13				

LDC #: 34928F1

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

SDG #: 15-19491

Laboratory: BC Laboratories, Inc.

Date: 9/4/15

Page: 2 of 2

Reviewer:

2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				
17				

Notes:

1	BYH0491 - ~~MB~~ BLK1						
2	BYH 0625 - BLK1						

LDC #: 34928F1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: [illegible]

Method: Volatiles (EPA Method 524.2)

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				
Were the BFB performance results 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 deviations (%RSD) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %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?			✓	
VII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?		✓		
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 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?	✓			

LDC #: 34928 F1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within +/-40% from the associated calibration standard?	✓			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	✓			
XI. 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?	✓			
XII. Compound quantitation/RLs				
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. Tentatively identified compounds (TICs)				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	✓			
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

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. Methyl iodide
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. Pentachloroethane
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1. Hexachloroethane
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 34928F1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

METHOD: GC/MS VOA (EPA Method 524.2)
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 all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	8/7/15	CCV-07AUG34/35	B	30.4	1-10 +	J/UJ/P (ND)
			Y1	30.8	BYH0625-BLK1	↓
			W1	38.3		
	8/8/15	CCV-07AUG65/66	B	61.0	11-12 +	J/UJ/P (ND)
			~~Y1~~ W1	46.1	~~BYH0491~~	↓
					BYH0491-BLK1	

CONCAL.1S5

LDC #: 34928F1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 6 of 1
Reviewer: BM
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (µg/L)		RPD
	2	3	
K	1.7	1.6	6
AA	0.29	0.31	7
S	0.085U	0.090	200

Compound	Concentration (µg/L)		RPD
	5	6	
K	0.42	0.55	27
AA	0.33	0.31	6
S	1.6	1.6	0

Compound	Concentration (µg/L)		RPD
	8	9	
P	0.38	0.43	12
~~NK~~ K	4.9	4.7	4
S	0.10	0.10	0
KK	0.17	0.17	0

LDC #: 34928F1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

METHOD: GC/MS VOA (EPA Method 524.2)

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 = $(A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/30/2015	1,1-Dichloroethene (IS1)	0.697237	0.697237	0.6682290	0.6682290	7.754823	7.754809
	MS-V5		Trichloroethene (IS2)	0.343890	0.343890	0.3375275	0.3375275	7.469184	7.469187
			1,1,2,2-Tetrachloethane	0.583603	0.583603	0.5832449	0.5832449	6.534171	6.534179

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 #: 34928F1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

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 = $(A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 32/80 std)	Recalculated RRF (RRF 32/80 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/30/2015	Allyl chloride (IS1)	0.633362	0.633362	0.6620764	0.6620764	12.922551	12.922551
	MS-V5		Methyl methacrylate (IS	0.083845	0.083845	0.08494876	0.08494876	8.605336	8.605336
			Pentachloroethane (IS3	0.572308	0.572308	0.5611418	0.5611418	7.802302	7.802317

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#: 34928F1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: ✓

METHOD: GC/MS VOA (EPA Method 524.2)

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 = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	07AUG34	8/7/2015	1,1-Dichloroethene (IS1)	0.668229	0.6072568	0.6072568	9.1	9.1
			Trichloroethene (IS2)	0.337528	0.3145925	0.3145925	6.8	6.8
			1,1,2,2-Tetrachloethane	0.583245	0.5661093	0.5661093	2.9	2.9
2	07AUG35	8/7/2015	Allyl chloride (IS1)	0.662076	0.6308859	0.6308859	4.7	4.7
			Methyl methacrylate (IS2	0.084949	0.08556169	0.08556169	0.7	0.7
			Pentachloroethane (IS3	0.561142	0.4684619	0.4684619	16.5	16.5

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 #: 34928F1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: BR
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

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: 7

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.00	9.79	97.9	97.9	0
Bromofluorobenzene	↓	9.82	98.2	98.2	0
1,2-Dichlorobenzene-d4	↓	9.92	99.2	99.2	0
Dibromofluoromethane	↓				

Sample ID:

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

Sample ID:

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

Sample ID:

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

LDC #: 34928F1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: BR
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

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: BYH0625-BS1

Compound	Spike Added (µg/L)		Spiked Sample Concentration (µg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	25.00		25.240		101	101				
Trichloroethene			24.640		98.6	98.6				
Benzene			25.430		102	102				
Toluene			23.960		95.8	95.8				
Chlorobenzene			22.850		91.4	91.4				

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 #: 34928F1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: BR
2nd reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

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. 7, 5: S = 3.5

Conc. = $\frac{(32336)(10)(\quad)}{(271557)(0.337528)(\quad)}$

= 3.527893677 ug/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 3, 2015

Parameters: Chromium

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-19491

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-10	1519491-04	Water	08/06/15
MW-5	1519491-05	Water	08/06/15
DUP-5-3Q15	1519491-06	Water	08/06/15
MW-6**	1519491-07**	Water	08/06/15
MW-8	1519491-08	Water	08/06/15
DUP-6-3Q15	1519491-09	Water	08/06/15
MW-15**	1519491-10**	Water	08/06/15

**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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Chromium by Environmental Protection Agency (EPA) Method 200.8

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): 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.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected 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 or analyte 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.

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% with the following exceptions:

Date	Isotope	Analyte	%RSD	Associated Samples	Flag	A or P
08/19/15	Magnesium^{24}	Chromium	11.7	All samples in SDG 15-19491	J (all detects)	P
08/19/15	Indium^{115}	Chromium	18.0	All samples in SDG 15-19491	J (all detects)	P

III. Instrument Calibration

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

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

ICP interference check sample analyses were not required by the method.

V. Laboratory Blanks

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

VI. Field Blanks

No field blanks were identified in this SDG.

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 was not performed for this SDG.

X. Laboratory Control Samples

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

XI. Field Duplicates

Samples MW-5 and DUP-5-3Q15 and samples MW-8 and DUP-6-3Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-5	DUP-5-3Q15	
Chromium	3.3	3.2	3

Analyte	Concentration (ug/L)		RPD
	MW-8	DUP-6-3Q15	
Chromium	16	17	6

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. 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 ICPMS tune %RSD, data were qualified as estimated 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.

NASA JPL, 3Q2015
Chromium - Data Qualification Summary - SDG 15-19491

Sample	Analyte	Flag	A or P	Reason
MW-10 MW-5 DUP-5-3Q15 MW-6** MW-8 DUP-6-3Q15 MW-15**	Chromium	J (all detects)	P	ICPMS Tune (%RSD)

NASA JPL, 3Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-19491

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:53:55PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-10

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-04
File ID: PE_EL2_150819-047
Sampled: 08/06/15 09:40
Prepared: 08/13/15 08:00
Analyzed: 08/19/15 14:17
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH1124
Sequence: 1513457
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	6.7	1	J	EPA-200.8

9/9/15 d

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:53:55PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-5

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-05
File ID: PE_EL2_150819-048
Sampled: 08/06/15 10:47
Prepared: 08/13/15 08:00
Analyzed: 08/19/15 14:21
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH1124
Sequence: 1513457
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.3	1	J	EPA-200.8

9/9/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:53:55PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

DUP-5-3Q15

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-06
File ID: PE_EL2_150819-049
Sampled: 08/06/15 10:57
Prepared: 08/13/15 08:00
Analyzed: 08/19/15 14:24
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH1124
Sequence: 1513457
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.2	1	J	EPA-200.8

9/9/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065	Reported: 8/28/2015 4:53:55PM Project: JPL- GW Monitoring Wells Project Number: 3Q15 Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-6

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-07
File ID: PE_EL2_150819-050
Sampled: 08/06/15 11:55
Prepared: 08/13/15 08:00
Analyzed: 08/19/15 14:28
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH1124
Sequence: 1513457
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	250	1	J	EPA-200.8

9/9/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:53:55PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-8

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-08
File ID: PE_EL2_150819-051
Sampled: 08/06/15 09:35
Prepared: 08/13/15 08:00
Analyzed: 08/19/15 14:31
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH1124
Sequence: 1513457
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	16	1	J	EPA-200.8

9/9/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/28/2015 4:53:55PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-15

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-10
File ID: PE_EL2_150819-053
Sampled: 08/06/15 10:35
Prepared: 08/13/15 08:00
Analyzed: 08/19/15 14:38
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYH1124
Sequence: 1513457
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.5	1	J J	EPA-200.8

9/9/15

LDC #: 34928F4a
SDG #: 15-19491
Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 9/2/15
Page: 1 of 1
Reviewer: JD
2nd Reviewer: a

METHOD: Chromium (EPA Method 200.8)

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	8/6/15
II.	ICP/MS Tune	SW	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	A	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	N	CS
VIII.	Duplicate sample analysis	N	
IX.	ICP Serial Dilution	N	Not Performed
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	FD = (2,3) (5,6)
XII.	Internal Standard (ICP-MS)	A	Not reviewed for Level 3
XIII.	Sample Result Verification	A	Not reviewed for Level III 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 Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-10	1519491-04	Water	08/06/15
2	MW-5	1519491-05	Water	08/06/15
3	DUP-5-3Q15	1519491-06	Water	08/06/15
4	MW-6**	1519491-07**	Water	08/06/15
5	MW-8	1519491-08	Water	08/06/15
6	DUP-6-3Q15	1519491-09	Water	08/06/15
7	MW-15**	1519491-10**	Water	08/06/15
8				
9				
10				
11				
12				
13				

Notes:

LDC #: 34928PKS

VALIDATION FINDINGS CHECKLIST

Reviewer: JSD
2nd Reviewer: a

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?	✓			

LDC #: 34928F49

VALIDATION FINDINGS CHECKLIST

Reviewer: JB
2nd Reviewer: [illegible]

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 #: 34928F4a

VALIDATION FINDINGS WORKSHEET
Tune (ICP-MS)

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

METHOD: Metals (EPA SW846 Method6020)

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

Y N N/A Were all isotopes in the tuning solution mass resolution within 0.1amu?

Y N N/A Were %RSD of isotopes in the tuning solution ≤5%?

#	Date	Isotope	Associated Metals	Mass (Limits)	RSD (≤5%)	Associated Samples	Qualifications
	08/19/15	Mg^{24} ~~24.0~~	Cr		11.7	All	J/UJ/P (det)
		In^{115} ~~114.9~~	Cr		18.0		J/UJ/P (det)

LDC#: 34928F4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: ESD
2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 6010B/7000)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (ug/L)		RPD
	2	3	
Chromium	3.3	3.2	3

Analyte	Concentration (ug/L)		RPD
	5	6	
Chromium	16	17	6

LDC #: 34928A9

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: JP
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 / True x 100 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)	Cr	49.392 ug/L	50 ug/L	98.8%R	98.8%R	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV 13:59	ICP/MS (Continuing calibration)	Cr	37.9 ug/L	40 ug/L	94.8%R	94.8%R	Y
	CVAA (Contining calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments:

LDC #: 34928F4

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)
N	ICP interference check						
LCS 15:42	Laboratory control sample	Cr	40.856ug/L	40ug/L	102%R	102%R	Y
N	Matrix spike		(SSR-SR)				
N	Duplicate						
N	ICP serial dilution						

Comments: _____

TOTCLC.4SW

LDC #: 34928E4a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 (7) Cr 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

RD = 1.5 ug/L

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	4	Cr	250	250	Y
	7	↓	1.5	1.5	↓

Note:

RECALC.4SW

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 3, 2015

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-19491

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-13	1519491-02	Water	08/06/15
DUP-7-3Q15	1519491-03	Water	08/06/15
MW-10	1519491-04	Water	08/06/15
MW-5	1519491-05	Water	08/06/15
DUP-5-3Q15	1519491-06	Water	08/06/15
MW-6**	1519491-07**	Water	08/06/15
MW-8	1519491-08	Water	08/06/15
DUP-6-3Q15	1519491-09	Water	08/06/15
MW-15**	1519491-10**	Water	08/06/15
MW-16	1519491-11	Water	08/06/15
MW-7	1519491-12	Water	08/06/15
MW-13MS	1519491-02MS	Water	08/06/15
MW-13MSD	1519491-02MSD	Water	08/06/15
MW-13DUP	1519491-02DUP	Water	08/06/15
MW-10MS	1519491-04MS	Water	08/06/15
MW-10MSD	1519491-04MSD	Water	08/06/15
MW-10DUP	1519491-04DUP	Water	08/06/15

**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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by EPA SW 846 Method 7196
Nitrite as Nitrogen by EPA Method 353.2
Orthophosphate as Phosphorus by EPA Method 365.1
Perchlorate by EPA Method 314.0

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): 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.

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.

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

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

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

V. Field Blanks

No field blanks were identified in this SDG.

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 with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
MW-13MS/MSD (MW-13 MW-5 DUP-5-3Q15 MW-6** MW-8 DUP-6-3Q15 MW-7)	Perchlorate	-	126 (80-120)	J (all detects)	A
MW-13MS/MSD (MW-16)	Perchlorate	-	126 (80-120)	NA	-

Relative percent differences (RPD) were within QC limits.

VII. Duplicates

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 methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples MW-13 and DUP-7-3Q15, samples MW-5 and DUP-5-3Q15, and samples MW-8 and DUP-6-3Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-13	DUP-7-3Q15	
Perchlorate	1400	1100	24

Analyte	Concentration (ug/L)		RPD
	MW-5	DUP-5-3Q15	
Perchlorate	7.4	6.4	14

Analyte	Concentration		RPD
	MW-8	DUP-6-3Q15	
Perchlorate	73 ug/L	67 ug/L	9
Hexavalent chromium	0.0045 mg/L	0.0045 mg/L	0

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 methods. No results were rejected in this SDG.

Due to MS/MSD %R, data were qualified as estimated 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.

NASA JPL, 3Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-19491

Sample	Analyte	Flag	A or P	Reason
MW-13 MW-5 DUP-5-3Q15 MW-6** MW-8 DUP-6-3Q15 MW-7	Perchlorate	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)

NASA JPL, 3Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-19491

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:48:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-300.0

MW-8

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-08
File ID: E080715A.seq-16
Sampled: 08/06/15 09:35
Prepared: 08/07/15 11:00
Analyzed: 08/07/15 16:07
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0605
Sequence: 1513463
Calibration: UNASSIGNED
Instrument: IC5

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	66	1		EPA-300.0
14797-55-8	Nitrate as N	1.6	1		EPA-300.0
14808-79-8	Sulfate	45	1		EPA-300.0

9/1/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:48:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-8

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-08
File ID: 150807 0823 NO2-009
Sampled: 08/06/15 09:35
Prepared: 08/07/15 08:23
Analyzed: 08/07/15 08:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0583
Sequence: 1512799
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.012	1	U	EPA-353.2

9/7/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:48:00PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-365.1

MW-8

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-08
File ID: 150807 0853 PO4-037
Sampled: 08/06/15 09:35
Prepared: 08/07/15 08:53
Analyzed: 08/07/15 09:13
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0696
Sequence: 1512800
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.017	1	U	EPA-365.1

9/1/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-13

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-02
File ID: F081915A.seq-46.0000.txt
Sampled: 08/06/15 08:00
Prepared: 08/19/15 19:00
Analyzed: 08/20/15 00:27
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1761
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1400	100	D J	EPA-314.0

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

DUP-7-3Q15

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-03RE1
File ID: F082015.seq-28.0000.txt
Sampled: 08/06/15 08:10
Prepared: 08/20/15 18:00
Analyzed: 08/20/15 18:06
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1959
Sequence: 1513627
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1100	100	D	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-10

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-04RE1
File ID: F082015.seq-30.0000.txt
Sampled: 08/06/15 09:40
Prepared: 08/20/15 18:00
Analyzed: 08/20/15 18:35
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1959
Sequence: 1513627
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.2	1		EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-5

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-05
File ID: F081915A.seq-37.0000.txt
Sampled: 08/06/15 10:47
Prepared: 08/19/15 19:00
Analyzed: 08/19/15 22:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1761
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	7.4	1	J	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

DUP-5-3Q15

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-06
File ID: F081915A.seq-38.0000.txt
Sampled: 08/06/15 10:57
Prepared: 08/19/15 19:00
Analyzed: 08/19/15 22:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1761
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	6.4	1	J	EPA-314.0

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-6

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-07
File ID: F081915A.seq-41.0000.txt
Sampled: 08/06/15 11:55
Prepared: 08/19/15 19:00
Analyzed: 08/19/15 23:15
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1761
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.6	1	J J	EPA-314.0

9/7/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-8

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-08RE1
File ID: F081915A.seq-57.0000.txt
Sampled: 08/06/15 09:35
Prepared: 08/19/15 19:00
Analyzed: 08/20/15 03:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1761
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	73	5	D J	EPA-314.0

9/7/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

DUP-6-3Q15

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-09RE1
File ID: F081915A.seq-59.0000.txt
Sampled: 08/06/15 09:45
Prepared: 08/19/15 19:00
Analyzed: 08/20/15 03:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1761
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	67	5	D J	EPA-314.0

9/7/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-16

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-11
File ID: F081915A.seq-44.0000.txt
Sampled: 08/06/15 11:00
Prepared: 08/19/15 19:00
Analyzed: 08/19/15 23:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1761
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/7/15 ✓

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-7

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-12RE1
File ID: F081915A.seq-73.0000.txt
Sampled: 08/06/15 13:20
Prepared: 08/19/15 19:00
Analyzed: 08/20/15 09:31
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1761
Sequence: 1513516
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	33	2	D J	EPA-314.0

9/7/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-10

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-04
File ID: 150806 2128 CR6-039
Sampled: 08/06/15 09:40
Prepared: 08/06/15 21:28
Analyzed: 08/07/15 00:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0575
Sequence: 1512795
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0012	1	J	EPA-7196

9/7/15 ✓

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-5

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-05
File ID: 150806 2128 CR6-043
Sampled: 08/06/15 10:47
Prepared: 08/06/15 21:28
Analyzed: 08/07/15 00:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0575
Sequence: 1512795
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

DUP-5-3Q15

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-06
File ID: 150806 2128 CR6-044
Sampled: 08/06/15 10:57
Prepared: 08/06/15 21:28
Analyzed: 08/07/15 00:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0575
Sequence: 1512795
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-6

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-07
File ID: 150806 2128 CR6-045
Sampled: 08/06/15 11:55
Prepared: 08/06/15 21:28
Analyzed: 08/07/15 00:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0575
Sequence: 1512795
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00090	1	J	EPA-7196

9/7/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-8

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-08
File ID: 150806 2128 CR6-055
Sampled: 08/06/15 09:35
Prepared: 08/06/15 21:28
Analyzed: 08/07/15 00:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0575
Sequence: 1512795
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0045	1		EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

DUP-6-3Q15

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-09
File ID: 150806 2128 CR6-049
Sampled: 08/06/15 09:45
Prepared: 08/06/15 21:28
Analyzed: 08/07/15 00:28
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0575
Sequence: 1512795
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0045	1		EPA-7196

9/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/31/2015 2:49:10PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-15

Laboratory: BC Laboratories
SDG: 15-19491
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1519491-10
File ID: 150806 2128 CR6-050
Sampled: 08/06/15 10:35
Prepared: 08/06/15 21:28
Analyzed: 08/07/15 00:28
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0575
Sequence: 1512795
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/7/15 [illegible]

LDC #: 34928F6

SDG #: 15-19491

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 9/2/15

Page: 1 of 1

Reviewer: JD

2nd Reviewer: OR

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Hexavalent Chromium (EPA SW846 Method 7196), Nitrite-N (EPA Method 353.2), ortho-Phosphate (EPA Method 365.1), Perchlorate (EPA Method 314.0)

ip

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	8/6/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	SW	MS/D=(12,13)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	FD=(1,2)(4,5)(7,8)
X.	Sample result verification	A	Not reviewed for Level III validation.
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:

** Indicates sample underwent Level IV validation

	Client ID		Lab ID	Matrix	Date
1	MW-13	ClO_4	1519491-02	Water	08/06/15
2	DUP-7-3Q15		1519491-03	Water	08/06/15
3	MW-10	Cr^{+6}	1519491-04	Water	08/06/15
4	MW-5		1519491-05	Water	08/06/15
5	DUP-5-3Q15		1519491-06	Water	08/06/15
6	MW-6**		1519491-07**	Water	08/06/15
7	MW-8	Cr^{+6}, ClO_4, $ortho\ PO_4$, NO_2, 300.0	1519491-08	Water	08/06/15
8	DUP-6-3Q15	Cr^{+6} ClO_4	1519491-09	Water	08/06/15
9	MW-15**		1519491-10**	Water	08/06/15
10	MW-16	ClO_4	1519491-11	Water	08/06/15
11	MW-7		1519491-12	Water	08/06/15
12	MW-13MS	ClO_4	1519491-02MS	Water	08/06/15
13	MW-13MSD		1519491-02MSD	Water	08/06/15
14	MW-13DUP		1519491-02DUP	Water	08/06/15
15	MW-10MS	Cr^{+6}	1519491-04MS	Water	08/06/15
16	MW-10MSD		1519491-04MSD	Water	08/06/15
17	MW-10DUP		1519491-04DUP	Water	08/06/15

LDC #: 34928F6

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
2nd Reviewer: 02

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~~ 85 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 #: 34928F6

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: CR

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 #: 34578EV

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Parameter
1-2, 10-11	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
9	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
3-6, 8	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
7	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 34928F6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: SD
2nd Reviewer: G

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 80-120? 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	W	ClO4		126		1, 4-8, 10-11	Jdet/A (det = 1, 4-8, 11)

Comments:

LDC#:34928F6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JD
2nd Reviewer: [illegible]

Inorganics, Method See Cover

Analyte	Concentration		RPD
	1	2	
Perchlorate	1400 (ug/L)	1100 (ug/L)	24

Analyte	Concentration		RPD
	4	5	
Perchlorate	7.4 (ug/L)	6.4 (ug/L)	14

Analyte	Concentration		RPD
	7	8	
Perchlorate	73 (ug/L)	67 (ug/L)	9
Hexavalent Chromium	0.0045 (mg/L)	0.0045 (mg/L)	0

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\34928F6.wpd

LDC #: 34928F6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 6/25/15

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. (mg/l)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cr^{+6}	s1	0.00	0	0.999950	0.999907	y*
		s2	0.002	0.002			
		s3	0.005	0.004			
		s4	0.025	0.02			
		s5	0.05	0.039			
		s6	0.1	0.077			
ICV Calibration verification	Cr^{+6}	Found 0.048mg/L	True 0.05mg/L		96%R	NR	y
(A) CCV 00:30 Calibration verification	Cr^{+6}	0.052mg/L	0.05mg/L		104%R	104%R	↓
ICV 13:30 Calibration verification	ClO_4	10ug/L	10ug/L		100%R	95.0%R	y*

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.

*Rounding

LDC #: 34928F6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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 20:37	Laboratory control sample	ClO_4	11.25 ug/L	10 ug/L	113%R	113%R	Y
MS 00:25	Matrix spike sample	Cr^{+6}	(SSR-SR) 0.0509 mg/L	0.052632 mg/L	96.7%R	96.3%R	Y
DUP 00:25	Duplicate sample	Cr^{+6}	0.0013	0.0013	0 %RPD	3.27%RPD	Y*

Comments:

*Rounding

TOTCLC.6

LDC #: 34928F6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 3D
2nd reviewer: 2

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 (6) Cr reported with a positive detect were recalculated and verified using the following equation:

Concentration = (A) 1.305 Recalculation: 0.001 (1.305) = 0.0013 mg/L

A = 0.001

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	6	Cr^{+6}	0.00090	0.0013	Y*
		ClO_4	3.6ug/L	3.8ug/L	Y*

Note: # 9 = ND

*Rounding

RECALC.6

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

Tidewater, Inc.
199 Shell Street
Manhattan Beach, CA 90266
ATTN: Mr. David Conner

September 3, 2015

SUBJECT: NASA JPL, 3Q2015, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on August 26, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #34894:

SDG #	Fraction
15-18301, 15-18411, 15-18537	Volatiles, Metals, Wet Chemistry

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

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Pei Geng

Pei Geng
Project Manager/Senior Chemist

HC

Attachment 1

90/10 (client select) LDC #34894 (Tidewater- Manhattan Beach, CA / NASA JPL, 3Q2015)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)		Metals (200.7 /200.8)		CLO_4 (314.0)		Cr(VI) (7196)																											
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
A	15-18301	08/26/15	09/17/15	8	0	7	0	7	0	7	0																										
B	15-18411	08/26/15	09/17/15	12	0	6	0	11	0	6	0																										
B	15-18411	08/26/15	09/17/15	1	0	0	0	1	0	0	0																										
C	15-18537	08/26/15	09/17/15	10	0	8	0	9	0	8	0																										
Total	A/PG			31	0	21	0	28	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	101

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

L:\Tidewater\NASA JPL\34894ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 1, 2015

Parameters: Volatiles

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18301

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-1-072715	1518301-01	Water	07/27/15
EB-1-072715	1518301-02	Water	07/27/15
MW-20-5	1518301-03	Water	07/27/15
MW-20-4	1518301-04	Water	07/27/15
MW-20-3	1518301-05	Water	07/27/15
Dup-1-3Q15	1518301-06	Water	07/27/15
MW-20-2	1518301-07	Water	07/27/15
SB-1-072715	1518301-08	Water	07/27/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). 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) Method 524.2

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): 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.

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.

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

Instrument performance was checked 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, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

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 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds. with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
07/31/15	Methyl iodide Pentachloroethane	35.7 50.3	All samples in SDG 15-18301	UJ (all non-detects) UJ (all non-detects)	P

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 TB-1-072715 was identified as a trip blank. No contaminants were found.

Sample EB-1-072715 was identified as an equipment blank. No contaminants were found.

Sample SB-1-072715 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) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples MW-20-3 and Dup-1-3Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-20-3	Dup-1-3Q15	
Ethylbenzene	0.20	0.13	42
Styrene	0.42	0.33	24
Tetrachloroethene	0.32	0.36	12
Acrylonitrile	2.3	1.3	56
Carbon disulfide	0.39	0.38U	200

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 continuing calibration %D, data were qualified as estimated in eight 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.

NASA JPL, 3Q2015
Volatiles - Data Qualification Summary - SDG 15-18301

Sample	Compound	Flag	A or P	Reason
TB-1-072715 EB-1-072715 MW-20-5 MW-20-4 MW-20-3 Dup-1-3Q15 MW-20-2 SB-1-072715	Methyl iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-18301

No Sample Data Qualified in this SDG

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-1-072715

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-01	File ID:	31JUL44.D
Sampled:	07/27/15 08:00	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 21:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/1/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-1-072715

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-01	File ID:	31JUL44.D
Sampled:	07/27/15 08:00	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 21:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-1-072715

Laboratory:	BC Laboratories		SDG:	15-18301	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518301-01		File ID:	31JUL44.D
Sampled:	07/27/15 08:00	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 21:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.3900	93.9	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7600	97.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.450	104	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	201860	6.74	201559	6.73	
Chlorobenzene-d5 (IS)	66542	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	281174	7.52	280723	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-1-072715

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-02	File ID:	31JUL45.D
Sampled:	07/27/15 08:30	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 21:45
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/1/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-1-072715

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-02	File ID:	31JUL45.D
Sampled:	07/27/15 08:30	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 21:45
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-1-072715

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-02	File ID:	31JUL45.D
Sampled:	07/27/15 08:30	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 21:45
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence:	1512214	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.6500	96.5	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8200	98.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9800	99.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	199901	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	69646	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	286120	7.52	280723	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-5

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-03	File ID:	31JUL46.D
Sampled:	07/27/15 10:30	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 22:08
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-5

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-03	File ID:	31JUL46.D
Sampled:	07/27/15 10:30	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 22:08
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.30	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/8/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-5

Laboratory:	BC Laboratories		SDG:	15-18301	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518301-03	File ID:	31JUL46.D
Sampled:	07/27/15 10:30	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 22:08
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.61	J
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.4100	94.1	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.060	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9500	99.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194168	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	67820	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	268960	7.52	280723	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-4

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-04	File ID:	31JUL47.D
Sampled:	07/27/15 11:20	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 22:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-4

Laboratory:	BC Laboratories		SDG:	15-18301	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518301-04	File ID:	31JUL47.D
Sampled:	07/27/15 11:20	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 22:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/8/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-4

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-04	File ID:	31JUL47.D
Sampled:	07/27/15 11:20	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 22:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence:	1512214	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.3300	93.3	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9500	99.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.360	104	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	198297	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	67832	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	273916	7.52	280723	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-3

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-05	File ID:	31JUL48.D
Sampled:	07/27/15 12:10	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 22:53
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-3

Laboratory:	BC Laboratories		SDG:	15-18301	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518301-05		File ID:	31JUL48.D
Sampled:	07/27/15 12:10	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 22:53
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.20	J
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.42	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.32	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	2.3	J
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

8/27/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-3

Laboratory:	BC Laboratories		SDG:	15-18301	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518301-05	File ID:	31JUL48.D
Sampled:	07/27/15 12:10	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 22:53
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2652 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.39	J
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9000	99.0	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.090	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3800	93.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	193617	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	69711	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	265162	7.52	280723	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-1-3Q15

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-06	File ID:	31JUL49.D
Sampled:	07/27/15 12:50	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 23:16
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2652 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-1-3Q15

Laboratory:	BC Laboratories		SDG:	15-18301	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518301-06	File ID:	31JUL49.D
Sampled:	07/27/15 12:50	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 23:16
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.13	J
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.33	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.36	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.3	J
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-1-3Q15

Laboratory:	BC Laboratories		SDG:	15-18301	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518301-06	File ID:	31JUL49.D
Sampled:	07/27/15 12:50	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 23:16
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.7600	97.6	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8700	98.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7600	97.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	199801	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	69613	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	280583	7.52	280723	7.52	

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-2

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-07	File ID:	31JUL50.D
Sampled:	07/27/15 13:20	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 23:39
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.29	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-2

Laboratory:	BC Laboratories		SDG:	15-18301	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518301-07		File ID:	31JUL50.D
Sampled:	07/27/15 13:20	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 23:39
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.13	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.45	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-2

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-07	File ID:	31JUL50.D
Sampled:	07/27/15 13:20	Prepared:	07/31/15 06:00	Analyzed:	07/31/15 23:39
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2652	Sequence:	1512214	Calibration:	1507019	Instrument:	MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.000	100	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.090	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.5000	95.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	182353	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	63735	9.73	72260	9.73	
1,4-Difluorobenzene (IS)	250914	7.52	280723	7.52	

9/1/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-1-072715

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-08	File ID:	31JUL51.D
Sampled:	07/27/15 08:40	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 00:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-1-072715

Laboratory:	BC Laboratories			SDG:	15-18301
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518301-08	File ID:	31JUL51.D
Sampled:	07/27/15 08:40	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 00:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:02:29PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-1-072715

Laboratory:	BC Laboratories		SDG:	15-18301	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518301-08	File ID:	31JUL51.D
Sampled:	07/27/15 08:40	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 00:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.3900	93.9	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8500	98.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.350	104	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	198422	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	67845	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	276170	7.51	280723	7.52	

9/2/15

LDC #: 34894A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/31/15

SDG #: 15-18301 Level III Page: 1 of 1

Laboratory: BC Laboratories, Inc. Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

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 ≤ 20 %, r^2 ICV ≤ 30%
IV.	Continuing calibration	SW	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 EB = 2 SB = 8
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	Client spec.
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	FD = 5 + 6
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	TB-1-072715	1518301-01	Water	07/27/15
2	EB-1-072715	1518301-02	Water	07/27/15
3	MW-20-5	1518301-03	Water	07/27/15
4	MW-20-4	1518301-04	Water	07/27/15
5	MW-20-3	1518301-05	Water	07/27/15
6	Dup-1-3Q15	1518301-06	Water	07/27/15
7	~~3~~ MW-20-2	1518301-07	Water	07/27/15
8	SB-1-072715	1518301-08	Water	07/27/15
9				
10				
11				
12	BYG2653 - BLK1			
13	BYG2653 - BLK1			

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. Methyl iodide
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Pentachloroethane
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1.
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 #: 34894A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

METHOD: GC/MS VOA (EPA Method 524.2)
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 all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	7/31/15	CCV - 31JUL35	V1	35.7	All	J/UJ/P (WD)
			W1	50.3		L

CONCAL.1S5

LDC #: 34894A1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: SR
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (µg/L)		RPD
	5	6	
EE	0.20	0.13	42
FF	0.42	0.33	24
AA	0.32	0.36	12
GGGG	~~0~~ 2.3	1.3	56
G	0.39	0.38u	200

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 2, 2015

Parameters: Chromium

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18301

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-1-072715	1518301-02	Water	07/27/15
MW-20-5	1518301-03	Water	07/27/15
MW-20-4	1518301-04	Water	07/27/15
MW-20-3	1518301-05	Water	07/27/15
Dup-1-3Q15	1518301-06	Water	07/27/15
MW-20-2	1518301-07	Water	07/27/15
SB-1-072715	1518301-08	Water	07/27/15
EB-1-072715MS	1518301-02MS	Water	07/27/15
EB-1-072715MSD	1518301-02MSD	Water	07/27/15
EB-1-072715DUP	1518301-02DUP	Water	07/27/15
MW-20-3DUP	1518301-05DUP	Water	07/27/15
MW-20-3MS	1518301-05MS	Water	07/27/15
MW-20-3MSD	1518301-05MSD	Water	07/27/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Chromium by Environmental Protection Agency (EPA) Method 200.8

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): 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.

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.

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 method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

ICP Interference check sample (ICS) analysis data were not required by the method.

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	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium	0.92100 ug/L	MW-20-3 Dup-1-3Q15 MW-20-2 SB-1-072715
ICB/CCB	Chromium	0.76800 ug/L	Dup-1-3Q15 MW-20-2 SB-1-072715

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 (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-20-3	Chromium	0.65 ug/L	0.65U ug/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
Dup-1-3Q15	Chromium	1.1 ug/LL	1.1U ug/LL
MW-20-2	Chromium	1.2 ug/L	1.2U ug/L
SB-1-072715	Chromium	1.4 ug/L	1.4U ug/L

VI. Field Blanks

Sample EB-1-072715 was identified as an equipment blank. No contaminants were found.

Sample SB-1-072715 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
SB-1-072715	Chromium	1.4

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. Duplicate Sample Analysis

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

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

XI. Field Duplicates

Samples MW-20-3 and Dup-1-3Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-20-3	Dup-1-3Q15	
Chromium	0.65	1.1	51

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 method. No results were rejected in this SDG.

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

NASA JPL, 3Q2015
Chromium - Data Qualification Summary - SDG 15-18301

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-18301

Sample	Analyte	Modified Final Concentration	A or P
MW-20-3	Chromium	0.65U ug/L	A
Dup-1-3Q15	Chromium	1.1U ug/LL	A
MW-20-2	Chromium	1.2U ug/L	A
SB-1-072715	Chromium	1.4U ug/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:04:31PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-1-072715

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-02
File ID: PE_EL2_150803-114
Sampled: 07/27/15 08:30
Prepared: 07/30/15 08:40
Analyzed: 08/03/15 16:51
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2568
Sequence: 1512491
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:04:31PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-5

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-03
File ID: PE_EL2_150803-255
Sampled: 07/27/15 10:30
Prepared: 07/30/15 08:40
Analyzed: 08/04/15 01:33
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2568
Sequence: 1512491
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:04:31PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-4

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-04
File ID: PE_EL2_150803-256
Sampled: 07/27/15 11:20
Prepared: 07/30/15 08:40
Analyzed: 08/04/15 01:36
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2568
Sequence: 1512491
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/8/15 Q

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:04:31PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-3

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-05
File ID: PE_EL2_150731-145
Sampled: 07/27/15 12:10
Prepared: 07/30/15 09:00
Analyzed: 07/31/15 19:36
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2571
Sequence: 1512292
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.65	1	J U	EPA-200.8

9/8/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:04:31PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

Dup-1-3Q15

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-06
File ID: PE_EL2_150731-175
Sampled: 07/27/15 12:50
Prepared: 07/30/15 09:00
Analyzed: 07/31/15 21:20
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2571
Sequence: 1512292
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.1	1	J U	EPA-200.8

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:04:31PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-2

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-07
File ID: PE_EL2_150731-176
Sampled: 07/27/15 13:20
Prepared: 07/30/15 09:00
Analyzed: 07/31/15 21:24
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2571
Sequence: 1512292
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.2	1	J U	EPA-200.8

9/8/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:04:31PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

SB-1-072715

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-08
File ID: PE_EL2_150731-177
Sampled: 07/27/15 08:40
Prepared: 07/30/15 09:00
Analyzed: 07/31/15 21:27
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2571
Sequence: 1512292
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.4	1	J U	EPA-200.8

9/8/15

LDC #: 34894A4a

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 8/27/15

SDG #: 15-18301

Page: 1 of 1

Laboratory: BC Laboratories, Inc.

Reviewer: JD

2nd Reviewer: a

METHOD: ~~Metals~~ CN (EPA Method ~~200.7~~ JD/200.8)

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	7/27/15
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not Required
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB=(1) SB=(7)
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/D = (8,9)(12,13)
VIII.	Duplicate sample analysis	A	DUP
IX.	ICP Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	FD = (4,5)
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	EB-1-072715	1518301-02	Water	07/27/15
2	MW-20-5	1518301-03	Water	07/27/15
3	MW-20-4	1518301-04	Water	07/27/15
4	MW-20-3	1518301-05	Water	07/27/15
5	Dup-1-3Q15	1518301-06	Water	07/27/15
6	MW-20-2	1518301-07	Water	07/27/15
7	SB-1-072715	1518301-08	Water	07/27/15
8	EB-1-072715MS	1518301-02MS	Water	07/27/15
9	EB-1-072715MSD	1518301-02MSD	Water	07/27/15
10	EB-1-072715DUP	1518301-02DUP	Water	07/27/15
11	#4 DUP			
12	#4 MS			
13	#4 MSD			
14				
15				

LDC #: 34894A4a

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: ____

Sample Concentration units, unless otherwise noted: ug/L Associated Samples: 4-7

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	4	5	6	7						
Cr		0.92100		4.605	0.65	1.1	1.2	1.4						

Sample Concentration units, unless otherwise noted: ug/L Associated Samples: 5-7

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	5	6	7							
Cr			0.76800	3.84	See PB	See PB	See PB							

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 #: 34894A4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: SD
2nd reviewer: G

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

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?

Sample: 7 Field Blank / Trip Blank / Rinsate / Other SB (circle one)

Analyte	Concentration Units (ug/L)
Cr	1.4

Sample: _____ Field Blank / Trip Blank / Rinsate / Other_____ (circle one)

Analyte	Concentration Units ( )

LDC#: 34894A4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: JD

2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 6010B/7000)

Y N NA Were field duplicate pairs identified in this SDG?

Y N NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (ug/L)		RPD
	4	5	
Chromium	0.65	1.1	51

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\34894A4a.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: September 2, 2015

Parameters: Wet Chemistry

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18301

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-1-072715	1518301-02	Water	07/27/15
MW-20-5	1518301-03	Water	07/27/15
MW-20-4	1518301-04	Water	07/27/15
MW-20-3	1518301-05	Water	07/27/15
Dup-1-3Q15	1518301-06	Water	07/27/15
MW-20-2	1518301-07	Water	07/27/15
SB-1-072715	1518301-08	Water	07/27/15
EB-1-072715MS	1518301-02MS	Water	07/27/15
EB-1-072715MSD	1518301-02MSD	Water	07/27/15
EB-1-072715DUP	1518301-02DUP	Water	07/27/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7196
Perchlorate by EPA Method 314.0

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): 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.

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.

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

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

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

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Hexavalent chromium	0.00083900 mg/L	All samples in SDG 15-18301
ICB/CCB	Hexavalent chromium	0.00094500 mg/L	EB-1-072715 MW-20-5 MW-20-4 Dup-1-3Q15
ICB/CCB	Hexavalent chromium	0.0010950 mg/L	MW-20-3 MW-20-2 SB-1-072715

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 (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-1-072715	Hexavalent chromium	0.000096 mg/L	0.000096U mg/L
MW-20-5	Hexavalent chromium	0.0012 mg/L	0.0012U mg/L
MW-20-4	Hexavalent chromium	0.0010 mg/L	0.0010U mg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-20-3	Hexavalent chromium	0.00084 mg/L	0.00084U mg/L
Dup-1-3Q15	Hexavalent chromium	0.0011 mg/L	0.0011U mg/L
MW-20-2	Hexavalent chromium	0.0010 mg/L	0.0010U mg/L
SB-1-072715	Hexavalent chromium	0.00078 mg/L	0.00078U mg/L

V. Field Blanks

Sample EB-1-072715 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (mg/L)
EB-1-072715	Hexavalent chromium	0.00096

Sample SB-1-072715 was identified as a rinsate. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (mg/L)
SB-1-072715	Hexavalent chromium	0.0010

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. Duplicates

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 methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples MW-20-3 and Dup-1-3Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-20-3	Dup-1-3Q15	
Perchlorate	1.7 ug/L	1.3U ug/L	200
Hexavalent chromium	0.00084 mg/L	0.0011 mg/L	27

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 methods. No results were rejected in this SDG.

Due to laboratory 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. Based upon the data validation all results are considered valid and usable for all purposes.

NASA JPL, 3Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-18301

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-18301

Sample	Analyte	Modified Final Concentration	A or P
EB-1-072715	Hexavalent chromium	0.000096U mg/L	A
MW-20-5	Hexavalent chromium	0.0012U mg/L	A
MW-20-4	Hexavalent chromium	0.0010U mg/L	A
MW-20-3	Hexavalent chromium	0.00084U mg/L	A
Dup-1-3Q15	Hexavalent chromium	0.0011U mg/L	A
MW-20-2	Hexavalent chromium	0.0010U mg/L	A
SB-1-072715	Hexavalent chromium	0.00078U mg/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-1-072715

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-02
File ID: 150727 1021 CR6-091
Sampled: 07/27/15 08:30
Prepared: 07/28/15 02:48
Analyzed: 07/28/15 04:08
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2352
Sequence: 1512042
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00096	1	J U	EPA-7196

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-5

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-03
File ID: 150727 1021 CR6-094
Sampled: 07/27/15 10:30
Prepared: 07/28/15 02:48
Analyzed: 07/28/15 04:08
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2352
Sequence: 1512042
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0012	1	J U	EPA-7196

9/2/15

Tidewater Inc.
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Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-4

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-04
File ID: 150727 1021 CR6-095
Sampled: 07/27/15 11:20
Prepared: 07/28/15 02:48
Analyzed: 07/28/15 04:08
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2352
Sequence: 1512042
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0010	1	J U	EPA-7196

9/2/15

Tidewater Inc.
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Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-20-3

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-05
File ID: 150727 1021 CR6-107
Sampled: 07/27/15 12:10
Prepared: 07/28/15 02:48
Analyzed: 07/28/15 04:24
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2352
Sequence: 1512042
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00084	1	J U	EPA-7196

9/2/15

Tidewater Inc.
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Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

Dup-1-3Q15

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-06
File ID: 150727 1021 CR6-096
Sampled: 07/27/15 12:50
Prepared: 07/28/15 02:48
Analyzed: 07/28/15 04:08
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2352
Sequence: 1512042
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0011	1	J	EPA-7196

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-2

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-07
File ID: 150727 1021 CR6-099
Sampled: 07/27/15 13:20
Prepared: 07/28/15 02:48
Analyzed: 07/28/15 04:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2352
Sequence: 1512042
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0010	1	J Y	EPA-7196

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

SB-1-072715

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-08
File ID: 150727 1021 CR6-100
Sampled: 07/27/15 08:40
Prepared: 07/28/15 02:48
Analyzed: 07/28/15 04:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2352
Sequence: 1512042
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00078	1	J U	EPA-7196

9/2/15 b

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

EB-1-072715

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-02
File ID: F081015.seq-17.0000.txt
Sampled: 07/27/15 08:30
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 14:57
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0717
Sequence: 1512859
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-20-5

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-03
File ID: F081015.seq-18.0000.txt
Sampled: 07/27/15 10:30
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 15:11
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0717
Sequence: 1512859
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-20-4

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-04
File ID: F081015.seq-19.0000.txt
Sampled: 07/27/15 11:20
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 15:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0717
Sequence: 1512859
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-20-3

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-05
File ID: F081015.seq-20.0000.txt
Sampled: 07/27/15 12:10
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 15:40
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0717
Sequence: 1512859
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.7	1	J	EPA-314.0

8/21/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

Dup-1-3Q15

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-06
File ID: F081015.seq-21.0000.txt
Sampled: 07/27/15 12:50
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 15:54
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0717
Sequence: 1512859
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-20-2

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-07
File ID: F081015.seq-22.0000.txt
Sampled: 07/27/15 13:20
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 16:08
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0717
Sequence: 1512859
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.3	1	J	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:03:28PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

SB-1-072715

Laboratory: BC Laboratories
SDG: 15-18301
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518301-08
File ID: F081015.seq-23.0000.txt
Sampled: 07/27/15 08:40
Prepared: 08/10/15 11:00
Analyzed: 08/10/15 16:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0717
Sequence: 1512859
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/2/15

LDC #: 34894A6

SDG #: 15-18301

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 8/21/15

Page: 1 of 1

Reviewer: JD

2nd Reviewer: [illegible]

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0)

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	7/27/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB=(1) SB=(7)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(8,9)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	FD=(4,5)
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	EB-1-072715	1518301-02	Water	07/27/15
2	MW-20-5	1518301-03	Water	07/27/15
3	MW-20-4	1518301-04	Water	07/27/15
4	MW-20-3	1518301-05	Water	07/27/15
5	Dup-1-3Q15	1518301-06	Water	07/27/15
6	2MW-20-2	1518301-07	Water	07/27/15
7	SB-1-072715	1518301-08	Water	07/27/15
8	EB-1-072715MS	1518301-02MS	Water	07/27/15
9	EB-1-072715MSD	1518301-02MSD	Water	07/27/15
10	EB-1-072715DUP	1518301-02DUP	Water	07/27/15
11				
12				
13				
14				

Notes:

LDC #: 34864A4

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Parameter
1-7	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 8-10	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 34894A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: JD
2nd Reviewer: OL

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** All

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		1	2	3	4	5	6	7			
Hexavalent Chromium	0.00083900		0.004195	0.00096	0.0012	0.0010	0.00084	0.0011	0.0010	0.00078			

Conc. units: mg/L **Associated Samples:** 1-3, 5

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		1	2	3	5						
Hexavalent Chromium		0.00094500	0.004725	See PB	See PB	See PB	See PB						

Conc. units: mg/L **Associated Samples:** 4, 6-7

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		4	6	7							
Hexavalent Chromium		0.0010950	0.005475	See PB	See PB	See PB							

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 #: 34894A6

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?

Sample: 7 Field Blank / Trip Blank / Rinsate / Other SB (circle one)

Analyte	Concentration Units (mg/L)
Cr+6	0.0010

Sample: 1 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

Analyte	Concentration Units (mg/L)
Cr+6	0.00096

LDC#: 34894A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 3D
2nd Reviewer: [illegible]

Inorganics, Method See Cover

Analyte	Concentration		RPD
	4	5	
Perchlorate	1.7 ug/L	1.3U ug/L	~~27~~ 200
Hexavalent Chromum	0.00084 mg/L	0.0011 mg/L	27

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\34894A6.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: August 31, 2015

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18411

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-2-072815	1518411-01	Water	07/28/15
EB-2-072815	1518411-02	Water	07/28/15
MW-25-5	1518411-03	Water	07/28/15
MW-25-4	1518411-04	Water	07/28/15
MW-25-3	1518411-05	Water	07/28/15
MW-25-2	1518411-06	Water	07/28/15
MW-25-1	1518411-07	Water	07/28/15
MW-19-5	1518411-08	Water	07/28/15
MW-19-4	1518411-09	Water	07/28/15
DUP-2-072815	1518411-10	Water	07/28/15
MW-19-3	1518411-11	Water	07/28/15
MW-19-2	1518411-12	Water	07/28/15
MW-19-1**	1518411-13**	Water	07/28/15
MW-25-4MS	1518411-04MS	Water	07/28/15
MW-25-4MSD	1518411-04MSD	Water	07/28/15

**Indicates sample underwent Level IV review

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). 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) Method 524.2

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 evaluation, 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): 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.

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.

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

Instrument performance was checked 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.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% 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.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all 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 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
07/31/15	Methyl iodide Pentachloroethane	35.7 50.3	TB-2-072815 EB-2-072815 MW-25-5 MW-25-4 MW-25-3 MW-25-2 MW-25-1 MW-19-5 MW-19-4 DUP-2-072815 MW-19-3 MW-19-2	UJ (all non-detects) UJ (all non-detects)	P

Date	Compound	%D	Associated Samples	Flag	A or P
08/01/15	Bromomethane 2,2-Dichloropropane Methyl iodide Pentachloroethane	61.3 34.5 45.8 46.9	MW-19-1**	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P

V. Laboratory Blanks

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

VI. Field Blanks

Sample TB-2-072815 was identified as a trip blank. No contaminants were found.

Sample EB-2-072815 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Compound	Concentration
EB-2-072815	Acetone	6.1 ug/L

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

X. Field Duplicates

Samples MW-19-4 and DUP-2-072815 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-19-4	DUP-2-072815	
Chloroform	0.19	0.20	5
Tetrachloroethene	0.48	0.47	2

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 continuing calibration %D, data were qualified as estimated in thirteen 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 (UJ) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NASA JPL, 3Q2015
Volatiles - Data Qualification Summary - SDG 15-18411

Sample	Compound	Flag	A or P	Reason
TB-2-072815 EB-2-072815 MW-25-5 MW-25-4 MW-25-3 MW-25-2 MW-25-1 MW-19-5 MW-19-4 DUP-2-072815 MW-19-3 MW-19-2	Methyl iodide Pentachloroethane I	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)
MW-19-1**	Bromomethane 2,2-Dichloropropane Methyl iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-18411

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-2-072815

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-01	File ID:	31JUL52.D
Sampled:	07/28/15 06:10	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 00:24
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

* 9/1/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-2-072815

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-01	File ID:	31JUL52.D
Sampled:	07/28/15 06:10	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 00:24
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/8/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-2-072815

Laboratory:	BC Laboratories		SDG:	15-18411	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518411-01	File ID:	31JUL52.D
Sampled:	07/28/15 06:10	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 00:24
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9000	99.0	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9700	99.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9700	99.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	203670	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	70158	9.73	72260	9.73	
1,4-Difluorobenzene (IS)	277950	7.52	280723	7.52	

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-2-072815

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-02	File ID:	31JUL53.D
Sampled:	07/28/15 06:30	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 00:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

8/2/15 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-2-072815

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-02	File ID:	31JUL53.D
Sampled:	07/28/15 06:30	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 00:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	6.1	J
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/1/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-2-072815

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-02	File ID:	31JUL53.D
Sampled:	07/28/15 06:30	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 00:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.6400	96.4	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6500	96.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.140	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	201187	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	69554	9.73	72260	9.73	
1,4-Difluorobenzene (IS)	286407	7.52	280723	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-5

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-03	File ID:	31JUL54.D
Sampled:	07/28/15 07:25	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 01:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

8/8/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-5

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-03	File ID:	31JUL54.D
Sampled:	07/28/15 07:25	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 01:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-5

Laboratory:	BC Laboratories		SDG:	15-18411	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518411-03	File ID:	31JUL54.D
Sampled:	07/28/15 07:25	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 01:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.56	J
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.4100	94.1	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9900	99.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.180	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	198379	6.74	201559	6.73	
Chlorobenzene-d5 (IS)	66363	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	269811	7.52	280723	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-4

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-04	File ID:	31JUL38.D
Sampled:	07/28/15 08:10	Prepared:	07/31/15 13:09	Analyzed:	07/31/15 19:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

8/7/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-4

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-04	File ID:	31JUL38.D
Sampled:	07/28/15 08:10	Prepared:	07/31/15 13:09	Analyzed:	07/31/15 19:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/1/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-4

Laboratory:	BC Laboratories		SDG:	15-18411	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518411-04	File ID:	31JUL38.D
Sampled:	07/28/15 08:10	Prepared:	07/31/15 13:09	Analyzed:	07/31/15 19:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.7400	97.4	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9800	99.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7800	97.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194565	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	67545	9.73	72260	9.73	
1,4-Difluorobenzene (IS)	272740	7.52	280723	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-3

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-05	File ID:	31JUL55.D
Sampled:	07/28/15 09:15	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 01:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.45	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

8/21/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-3

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-05	File ID:	31JUL55.D
Sampled:	07/28/15 09:15	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 01:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.21	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-3

Laboratory:	BC Laboratories		SDG:	15-18411	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518411-05	File ID:	31JUL55.D
Sampled:	07/28/15 09:15	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 01:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.6700	96.7	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8600	98.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6500	96.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	199807	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	67668	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	268583	7.52	280723	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-2

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-06	File ID:	31JUL56.D
Sampled:	07/28/15 09:50	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 01:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.13	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-2

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-06	File ID:	31JUL56.D
Sampled:	07/28/15 09:50	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 01:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.26	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-2

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-06	File ID:	31JUL56.D
Sampled:	07/28/15 09:50	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 01:55
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.050	100	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.100	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9600	99.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	197436	6.74	201559	6.73	
Chlorobenzene-d5 (IS)	68393	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	273171	7.52	280723	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-1

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-07	File ID:	31JUL57.D
Sampled:	07/28/15 10:20	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 02:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.45	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-1

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-07	File ID:	31JUL57.D
Sampled:	07/28/15 10:20	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 02:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.40	J
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.72	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-1

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-07	File ID:	31JUL57.D
Sampled:	07/28/15 10:20	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 02:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.220	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9900	99.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8600	98.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	198048	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	67082	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	270898	7.52	280723	7.52	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-5

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-08	File ID:	31JUL58.D
Sampled:	07/28/15 11:55	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 02:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.53	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-5

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-08	File ID:	31JUL58.D
Sampled:	07/28/15 11:55	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 02:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.10	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.61	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/3/15

BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-5

Laboratory:	BC Laboratories		SDG:	15-18411	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518411-08	File ID:	31JUL58.D
Sampled:	07/28/15 11:55	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 02:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.7700	97.7	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9300	99.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.350	104	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	196173	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	67271	9.73	72260	9.73	
1,4-Difluorobenzene (IS)	270206	7.52	280723	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-4

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-09	File ID:	31JUL59.D
Sampled:	07/28/15 12:40	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 03:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.19	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-4

Laboratory:	BC Laboratories		SDG:	15-18411	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518411-09	File ID:	31JUL59.D
Sampled:	07/28/15 12:40	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 03:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.48	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15 Q

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-4

Laboratory:	BC Laboratories		SDG:	15-18411	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518411-09	File ID:	31JUL59.D
Sampled:	07/28/15 12:40	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 03:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.150	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8900	98.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.320	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191967	6.74	201559	6.73	
Chlorobenzene-d5 (IS)	65247	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	267285	7.52	280723	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-2-072815

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-10	File ID:	31JUL60.D
Sampled:	07/28/15 13:00	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 03:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.20	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-2-072815

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-10	File ID:	31JUL60.D
Sampled:	07/28/15 13:00	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 03:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.47	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15 8

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-2-072815

Laboratory:	BC Laboratories		SDG:	15-18411	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518411-10		File ID:	31JUL60.D
Sampled:	07/28/15 13:00	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 03:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.420	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9900	99.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.400	104	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	184248	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	64081	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	259203	7.51	280723	7.52	

9/2/15 [illegible]

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-3

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-11	File ID:	31JUL61.D
Sampled:	07/28/15 13:30	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 03:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.30	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-3

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-11	File ID:	31JUL61.D
Sampled:	07/28/15 13:30	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 03:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.49	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.11	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-3

Laboratory:	BC Laboratories		SDG:	15-18411	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518411-11	File ID:	31JUL61.D
Sampled:	07/28/15 13:30	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 03:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9300	99.3	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9700	99.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8300	98.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191598	6.74	201559	6.73	
Chlorobenzene-d5 (IS)	66935	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	266186	7.51	280723	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-2

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-12	File ID:	31JUL62.D
Sampled:	07/28/15 14:00	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 04:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.6	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.23	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.32	J
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U

9/8/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-2

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-12	File ID:	31JUL62.D
Sampled:	07/28/15 14:00	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 04:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	1.2	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.6	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-2

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-12	File ID:	31JUL62.D
Sampled:	07/28/15 14:00	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 04:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9900	99.9	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9500	99.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.030	100	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191205	6.73	201559	6.73	
Chlorobenzene-d5 (IS)	65687	9.72	72260	9.73	
1,4-Difluorobenzene (IS)	267516	7.51	280723	7.52	

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-1

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-13	File ID:	31JUL75.D
Sampled:	07/28/15 14:40	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 09:08
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.4	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-1

Laboratory:	BC Laboratories			SDG:	15-18411
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518411-13	File ID:	31JUL75.D
Sampled:	07/28/15 14:40	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 09:08
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:06:11PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-1

Laboratory:	BC Laboratories		SDG:	15-18411	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518411-13	File ID:	31JUL75.D
Sampled:	07/28/15 14:40	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 09:08
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.010	100	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8200	98.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7800	97.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	193334	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	68285	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	264668	7.52	262686	7.52	

9/2/15

LDC #: 34894B1

SDG #: 15-18411

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 8/31/15

Page: 1 of 2

Reviewer:

2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

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 ≤ 20%, r ICV ≤ 30%
IV.	Continuing calibration	SW	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	TB = 1* EB = 2
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A~~N~~	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	FD = 9 + 10
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Target compound identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III 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 Level IV validation

	Client ID	Lab ID	Matrix	Date
1	TB-2-072815	1518411-01	Water	07/28/15
2	EB-2-072815	1518411-02	Water	07/28/15
3	MW-25-5	1518411-03	Water	07/28/15
4	MW-25-4	1518411-04	Water	07/28/15
5	MW-25-3	1518411-05	Water	07/28/15
6	MW-25-2	1518411-06	Water	07/28/15
7	MW-25-1	1518411-07	Water	07/28/15
8	MW-19-5	1518411-08	Water	07/28/15
9	MW-19-4	1518411-09	Water	07/28/15
10	DUP-2-072815	1518411-10	Water	07/28/15
11	MW-19-3	1518411-11	Water	07/28/15
12	MW-19-2	1518411-12	Water	07/28/15
13	MW-19-1**	1518411-13**	Water	07/28/15

LDC #: 34894B1

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 8/31/15

SDG #: 15-18411

Page: 2 of 2

Laboratory: BC Laboratories, Inc.

Reviewer: BN

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14	MW-25-4MS	1518411-04MS	Water	07/28/15
15	MW-25-4MSD	1518411-04MSD	Water	07/28/15
16				
17				
18				
19				
20				

Notes:

T	BY62653-BLK1						
2	151224-CCB3						

LDC #: 34844B1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: [illegible]

Method: Volatiles (EPA Method 524.2)

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				
Were the BFB performance results 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 deviations (%RSD) ≤ 20%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %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?			✓	
VII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	✓			
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 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?	✓			

LDC #: 34894B1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within +/-40% from the associated calibration standard?	✓			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	✓			
XI. 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?	✓			
XII. Compound quantitation/RLs				
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. Tentatively identified compounds (TICs)				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	✓			
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	✓	~~✓~~	n	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.	✓			

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. Methyl iodide
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Pentachloroethane
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1.
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 #: 34894B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

METHOD: GC/MS VOA (EPA Method 524.2)
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 all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0%)	Associated Samples	Qualifications
	7/31/15	CCV-31JUL35	V1	35.7	~~All~~	J/UJ/P (ND)
			W1	50.3	1-12 + 14-15	↓
					BYG2653-BLK1	
	8/1/15	CCV-31JUL65	B	61.3	13 +	J/UJ/P (ND)
			OD	34.5	1512214-CCB3	
			V1	45.8		
			W1	46.9		↓

CONCAL.1S5

LDC #: 34894B1

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: BN
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: 2 Field Blank / Trip Blank / Rinsate (circle one) EB

Compound	Concentration Units (µg/L)
F	6.1

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

LDC #: 34894B1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: RN
2nd reviewer: ~~X~~

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (µg/L)		RPD
	9	10	
K	0.19	0.20	5
AA	0.48	0.47	2

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 34894B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

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

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/30/2015	1,1-Dichloroethene (IS1)	0.697237	0.697237	0.6682290	0.6682290	7.754823	7.754809
	MS-V5		Trichloroethene (IS2)	0.343890	0.343890	0.3375275	0.3375275	7.469184	7.469187
			1,1,2,2-Tetrachloethane	0.583603	0.583603	0.5832449	0.5832449	6.534171	6.534179

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 #: 34894B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

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 = $(A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 32/80 std)	Recalculated RRF (RRF 32/80 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/30/2015	Allyl chloride (IS1)	0.633362	0.633362	0.6620764	0.6620764	12.922551	12.922551
	MS-V5		Methyl methacrylate (IS	0.083845	0.083845	0.08494876	0.08494876	8.605336	8.605336
			Pentachloroethane (IS3	0.572308	0.572308	0.5611418	0.5611418	7.802302	7.802317

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#: 34894B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

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

METHOD: GC/MS VOA (EPA Method 524.2)

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 = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	31JUL65	8/1/2015	1,1-Dichloroethene (IS1)	0.668229	0.640325	0.640325	4.2	4.2
			Trichloroethene (IS2)	0.337528	0.3224599	0.3224599	4.5	4.5
			1,1,2,2-Tetrachloethane	0.583245	0.6129926	0.6129926	5.1	5.1
2	31JUL66	8/1/2015	Allyl chloride (IS1)	0.662076	0.589107	0.589107	11.0	11.0
			Methyl methacrylate (IS2	0.084949	0.08578398	0.08578398	1.0	1.0
			Pentachloroethane (IS3	0.561142	0.2977492	0.2977492	46.9	46.9

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 #: 34894R1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: BR
2nd reviewer:

METHOD: GC/MS VOA (EPA Method 524.2)

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: 13

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.00	9.82	98.2	98.2	0
Bromofluorobenzene	↓	9.78	97.8	97.8	0
1,2-Dichlorobenzene-d4		10.01	100	100	0
Dibromofluoromethane					

Sample ID:

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

Sample ID:

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

Sample ID:

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

LDC#: 34894A1

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: BR

2nd Reviewer

METHOD: GC/MS VOA (EPA Method 524.2)

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

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

RPD = [MSC- MSDC] * 2) / (MSC + MSDC)*100

MSC = Matrix spike percent recovery

MSDC = Matrix spike duplicate percent recovery

MS/MSD samples: 14/15

Compound	Spike Added (µg/L)		Sample Conc. (µg/L)	Spiked Sample Concentration (µg/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-------	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
1,1-Dichloroethene	25.00	25.00	0	26.700	26.390	107%	107%	106%	106%	1.17%	1.17%
Trichloroethene	25.00	25.00	0	24.100	24.180	96.4%	96.4%	96.7%	96.7%	0.33%	0.33%
Benzene	25.00	25.00	0	24.990	24.390	100%	100%	97.6%	97.6%	2.43%	2.43%
Toluene	25.00	25.00	0	23.950	23.400	95.8%	95.8%	93.6%	93.6%	2.32%	2.32%
Chlorobenzene	25.00	25.00	0	23.330	23.040	93.3%	93.3%	92.2%	92.2%	1.25%	1.25%

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 #: 34894B1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: BR
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

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: BY G 2653-BLK1

Compound	Spike Added (µg/L)		Spiked Sample Concentration (µg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	25.000		25.580		102	102				
Trichloroethene			24.850		99.4	99.4				
Benzene			24.180		96.7	96.7				
Toluene			23.710		~~84~~ 94.8	94.8				
Chlorobenzene			23.660		94.6	94.6				

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 #: 34894R1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: BR
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

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. 13, k:

k = 1.4

Conc. = $\frac{(21208)(10)(\quad)(\quad)}{(193334)(0.7740171)(\quad)}$

= 1.417230447 ug/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: August 30, 2015

Parameters: Chromium

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18411

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-2-072815	1518411-02	Water	07/28/15
MW-25-5	1518411-03	Water	07/28/15
MW-25-4	1518411-04	Water	07/28/15
MW-25-3	1518411-05	Water	07/28/15
MW-25-2	1518411-06	Water	07/28/15
MW-25-1	1518411-07	Water	07/28/15
EB-2-072815MS	1518411-02MS	Water	07/28/15
EB-2-072815MSD	1518411-02MSD	Water	07/28/15
EB-2-072815DUP	1518411-02DUP	Water	07/28/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Chromium by Environmental Protection Agency (EPA) Method 200.8

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): 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.

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.

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 method.

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
08/03/15	CCV (19:59)	Chromium	88.7 (90-110)	MW-25-5 MW-25-4	J (all detects) UJ (all non-detects)	P

IV. ICP Interference Check Sample Analysis

ICP Interference check sample (ICS) analysis data were not required by the method.

V. Laboratory Blanks

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

VI. Field Blanks

Sample EB-2-072815 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. Duplicate Sample Analysis

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

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) were analyzed as required by the method. Percent recoveries (%R) 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 calibration %R, 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.

NASA JPL, 3Q2015
Chromium - Data Qualification Summary - SDG 15-18411

Sample	Analyte	Flag	A or P	Reason
MW-25-5 MW-25-4	Chromium	J (all detects) UJ (all non-detects)	P	Calibration (%R)

NASA JPL, 3Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-18411

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:10:40PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-2-072815

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-02
File ID: PE_EL2_150803-144
Sampled: 07/28/15 06:30
Prepared: 07/30/15 11:25
Analyzed: 08/03/15 18:53
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2584
Sequence: 1512448
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U	EPA-200.8

9/2/15 q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:10:40PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-5

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-03
File ID: PE_EL2_150803-157
Sampled: 07/28/15 07:25
Prepared: 07/30/15 11:25
Analyzed: 08/03/15 19:51
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2584
Sequence: 1512448
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.50	1	U U5	EPA-200.8

9/1/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:10:40PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-4

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-04
File ID: PE_EL2_150803-158
Sampled: 07/28/15 08:10
Prepared: 07/30/15 11:25
Analyzed: 08/03/15 19:54
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2584
Sequence: 1512448
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.7	1	J J	EPA-200.8

9/8/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:10:40PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-3

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-05
File ID: PE_EL2_150803-173
Sampled: 07/28/15 09:15
Prepared: 07/30/15 11:25
Analyzed: 08/03/15 20:49
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2584
Sequence: 1512448
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.0	1		EPA-200.8

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:10:40PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-25-2

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-06
File ID: PE_EL2_150803-174
Sampled: 07/28/15 09:50
Prepared: 07/30/15 11:25
Analyzed: 08/03/15 20:52
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2584
Sequence: 1512448
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.4	1		EPA-200.8

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:10:40PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-25-1

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-07
File ID: PE_EL2_150803-175
Sampled: 07/28/15 10:20
Prepared: 07/30/15 11:25
Analyzed: 08/03/15 20:56
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2584
Sequence: 1512448
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.0	1	J	EPA-200.8

9/2/15

LDC #: 34894B4a

SDG #: 15-18411

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 8/29/15

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: ~~Metals~~ GC/MS (EPA Method ~~200.7~~ 8260B/200.8)

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	7/28/15
II.	ICP/MS Tune	A	
III.	Instrument Calibration	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not Required
V.	Laboratory Blanks	A	
VI.	Field Blanks	ND	EB=(1)
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(7,8)
VIII.	Duplicate sample analysis	A	DUP
IX.	ICP Serial Dilution	A	
X.	Laboratory control samples	A	LCS
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	EB-2-072815	1518411-02	Water	07/28/15
2	MW-25-5	1518411-03	Water	07/28/15
3	MW-25-4	1518411-04	Water	07/28/15
4	MW-25-3	1518411-05	Water	07/28/15
5	MW-25-2	1518411-06	Water	07/28/15
6	MW-25-1	1518411-07	Water	07/28/15
7	EB-2-072815MS	1518411-02MS	Water	07/28/15
8	EB-2-072815MSD	1518411-02MSD	Water	07/28/15
9	EB-2-072815DUP	1518411-02DUP	Water	07/28/15
10				
11				
12				
13				
14				
15				

LDC #: 34894B4a

VALIDATION FINDINGS WORKSHEET
Calibration

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

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
	8/3/15	CCV (19:59)	WCr	88.7 (90-110)	2-3	J/UJ/P (det/nd)

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: August 30, 2015

Parameters: Wet Chemistry

Validation Level: Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18411

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-2-072815	1518411-02	Water	07/28/15
MW-25-5	1518411-03	Water	07/28/15
MW-25-4	1518411-04	Water	07/28/15
MW-25-3	1518411-05	Water	07/28/15
MW-25-2	1518411-06	Water	07/28/15
MW-25-1	1518411-07	Water	07/28/15
MW-19-5	1518411-08	Water	07/28/15
MW-19-4	1518411-09	Water	07/28/15
DUP-2-072815	1518411-10	Water	07/28/15
MW-19-3	1518411-11	Water	07/28/15
MW-19-2	1518411-12	Water	07/28/15
MW-19-1**	1518411-13**	Water	07/28/15
MW-25-4MS	1518411-04MS	Water	07/28/15
MW-25-4MSD	1518411-04MSD	Water	07/28/15
MW-25-4DUP	1518411-04DUP	Water	07/28/15
MW-19-1DUP**	1518411-13DUP**	Water	07/28/15
MW-19-1MS**	1518411-13MS**	Water	07/28/15
MW-19-1MSD**	1518411-13MSD**	Water	07/28/15

**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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7196
Perchlorate by EPA Method 314.0

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): 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.

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.

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

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

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

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Hexavalent chromium	0.00081000 mg/L	EB-2-072815 MW-25-5 MW-25-4 MW-25-3 MW-25-2 MW-25-1
ICB/CCB	Hexavalent chromium	0.00098800 mg/L	EB-2-072815 MW-25-4 MW-25-3 MW-25-2
ICB/CCB	Hexavalent chromium	0.00096500 mg/L	MW-25-1
ICB/CCB	Hexavalent chromium	0.0010200 mg/L	MW-25-5

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 (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-2-072815	Hexavalent chromium	0.00081 mg/L	0.00081U mg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-25-4	Hexavalent chromium	0.0018 mg/L	0.0018U mg/L
MW-25-3	Hexavalent chromium	0.0037 mg/L	0.0037U mg/L
MW-25-2	Hexavalent chromium	0.0024 mg/L	0.0024U mg/L

V. Field Blanks

Sample EB-2-072815 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (mg/L)
EB-2-072815	Hexavalent chromium	0.00081

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. Duplicates

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 methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples MW-19-4 and DUP-2-072815 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-19-4	DUP-2-072815	
Perchlorate	3.9 ug/L	3.7U ug/L	5

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 methods. No results were rejected in this SDG.

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

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NASA JPL, 3Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-18411

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-18411

Sample	Analyte	Modified Final Concentration	A or P
EB-2-072815	Hexavalent chromium	0.00081U mg/L	A
MW-25-4	Hexavalent chromium	0.0018U mg/L	A
MW-25-3	Hexavalent chromium	0.0037U mg/L	A
MW-25-2	Hexavalent chromium	0.0024U mg/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:08:12PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-2-072815

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-02
File ID: F081115.seq-11.0000.txt
Sampled: 07/28/15 06:30
Prepared: 08/11/15 10:00
Analyzed: 08/11/15 13:01
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0893
Sequence: 1512933
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:08:12PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-5

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-03
File ID: F081115.seq-12.0000.txt
Sampled: 07/28/15 07:25
Prepared: 08/11/15 10:00
Analyzed: 08/11/15 13:15
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0893
Sequence: 1512933
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/2/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:08:12PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-4

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-04
File ID: F081115.seq-7.0000.txt
Sampled: 07/28/15 08:10
Prepared: 08/11/15 10:00
Analyzed: 08/11/15 12:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0893
Sequence: 1512933
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	9.2	1		EPA-314.0

9/2/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:08:12PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-3

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-05
File ID: F081115.seq-16.0000.txt
Sampled: 07/28/15 09:15
Prepared: 08/11/15 10:00
Analyzed: 08/11/15 14:13
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0893
Sequence: 1512933
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	12	1		EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:08:12PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-2

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-06
File ID: F081115.seq-18.0000.txt
Sampled: 07/28/15 09:50
Prepared: 08/11/15 10:00
Analyzed: 08/11/15 14:41
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0893
Sequence: 1512933
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	13	1		EPA-314.0

9/2/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:08:12PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-1

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-07
File ID: F081115.seq-20.0000.txt
Sampled: 07/28/15 10:20
Prepared: 08/11/15 10:00
Analyzed: 08/11/15 15:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0893
Sequence: 1512933
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	10	1		EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:08:12PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-19-5

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-08
File ID: F081115.seq-22.0000.txt
Sampled: 07/28/15 11:55
Prepared: 08/11/15 10:00
Analyzed: 08/11/15 15:39
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0893
Sequence: 1512933
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.3	1	J	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:08:12PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-4

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-09
File ID: F081115.seq-24.0000.txt
Sampled: 07/28/15 12:40
Prepared: 08/11/15 10:00
Analyzed: 08/11/15 16:07
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0893
Sequence: 1512933
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.9	1	J	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:08:12PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

DUP-2-072815

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-10
File ID: F081115.seq-28.0000.txt
Sampled: 07/28/15 13:00
Prepared: 08/11/15 10:00
Analyzed: 08/11/15 17:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0893
Sequence: 1512933
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.7	1	J	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:08:12PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-19-3

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-11
File ID: F081115.seq-30.0000.txt
Sampled: 07/28/15 13:30
Prepared: 08/11/15 10:00
Analyzed: 08/11/15 17:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0893
Sequence: 1512933
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	6.1	1		EPA-314.0

9/2/15 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:08:12PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-19-2

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-12
File ID: F081015A.seq-8.0000.txt
Sampled: 07/28/15 14:00
Prepared: 08/10/15 17:00
Analyzed: 08/11/15 01:08
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0847
Sequence: 1512899
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	6.2	1		EPA-314.0

9/2/15 9

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:08:12PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-19-1

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-13
File ID: F081015A.seq-9.0000.txt
Sampled: 07/28/15 14:40
Prepared: 08/10/15 17:00
Analyzed: 08/11/15 01:22
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH0847
Sequence: 1512899
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/21/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:09:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

EB-2-072815

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-02
File ID: 150728 2146 CR6-026
Sampled: 07/28/15 06:30
Prepared: 07/28/15 21:46
Analyzed: 07/28/15 22:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2468
Sequence: 1512248
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00081	1	J U	EPA-7196

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:09:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-25-5

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-03
File ID: 150728 2146 CR6-037
Sampled: 07/28/15 07:25
Prepared: 07/28/15 21:46
Analyzed: 07/28/15 22:36
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2468
Sequence: 1512248
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/21/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:09:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-4

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-04
File ID: 150728 2146 CR6-022
Sampled: 07/28/15 08:10
Prepared: 07/28/15 21:46
Analyzed: 07/28/15 22:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2468
Sequence: 1512248
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0018	1	J U	EPA-7196

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:09:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-3

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-05
File ID: 150728 2146 CR6-028
Sampled: 07/28/15 09:15
Prepared: 07/28/15 21:46
Analyzed: 07/28/15 22:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2468
Sequence: 1512248
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0037	1	U	EPA-7196

9/1/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:09:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-25-2

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-06
File ID: 150728 2146 CR6-029
Sampled: 07/28/15 09:50
Prepared: 07/28/15 21:46
Analyzed: 07/28/15 22:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2468
Sequence: 1512248
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0024	1	U	EPA-7196

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:09:47PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-1

Laboratory: BC Laboratories
SDG: 15-18411
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518411-07
File ID: 150728 2146 CR6-032
Sampled: 07/28/15 10:20
Prepared: 07/28/15 21:46
Analyzed: 07/28/15 22:27
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2468
Sequence: 1512248
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/2/15

LDC #: 34894B6

SDG #: 15-18411

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 8/27/15

Page: 1 of 2

Reviewer: JD

2nd Reviewer: [illegible]

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0)

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	7/28/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB=(1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(13,14) (16,17)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	FD=(8,9)
X.	Sample result verification	A	Not reviewed for Level III validation.
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:

** Indicates sample underwent Level IV validation

	Client ID		Lab ID	Matrix	Date
1	EB-2-072815	ClO_4 Cr^{+6}	1518411-02	Water	07/28/15
2	MW-25-5		1518411-03	Water	07/28/15
3	MW-25-4		1518411-04	Water	07/28/15
4	MW-25-3		1518411-05	Water	07/28/15
5	MW-25-2		1518411-06	Water	07/28/15
6	MW-25-1		1518411-07	Water	07/28/15
7	MW-19-5		1518411-08	Water	07/28/15
8	MW-19-4		1518411-09	Water	07/28/15
9	DUP-2-072815		1518411-10	Water	07/28/15
10	MW-19-3		1518411-11	Water	07/28/15
11	MW-19-2		1518411-12	Water	07/28/15
12	MW-19-1**		1518411-13**	Water	07/28/15
13	~~EB-2-072815MS~~	JD	1518411-02MS	Water	07/28/15
14	EB-2-072815MSD		1518411-02MSD	Water	07/28/15
15	~~EB-2-072815DUP~~		1518411-02DUP	Water	07/28/15
16	MW-25-4MS	ClO_4 Cr^{+6}	1518411-04MS	Water	07/28/15
17	MW-25-4MSD		1518411-04MSD	Water	07/28/15

LDC #: 34894B6

SDG #: 15-18411

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 8/27/15

Page: 2 of 2

Reviewer: SD

2nd Reviewer: [illegible]

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0)

	Client ID	Lab ID	Matrix	Date
18	MW-25-4DUP ClO_4 Cr^{+6}	1518411-04DUP	Water	07/28/15
19	#12 DUP ClO_4			
20	#12 MS ↓			
21	#12 MSD ↓			
22				
23				
24				
25				

Notes:

LDC #: 34894B6

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
2nd Reviewer: CL

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~~ 85-115 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 #: [illegible]

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

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 #: 34894B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Parameter
1-6	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
7-12	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 16-18	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 19-21	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 34894B6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: JD
2nd Reviewer: OL

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 1-6

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		1	3	4	5						
Hexavalent Chromium	0.00081000		0.00405	0.00081	0.0018	0.0037	0.0024						

Conc. units: mg/L **Associated Samples:** 1, 3-5

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		1	3	4	5						
Hexavalent Chromium		0.00098800	0.00494	See PB	See PB	See PB	See PB						

Conc. units: mg/L **Associated Samples:** 6

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		No Qual.									
Hexavalent Chromium		0.00096500	0.004825										

Conc. units: mg/L **Associated Samples:** 2

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		No Qual.									
Hexavalent Chromium		0.0010200	0.0051										

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 #: 34894B6

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?

Sample: 1 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

Analyte	Concentration Units (mg/L)
Cr+6	0.00081

LDC#: 34894B6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: SD
2nd Reviewer: [illegible]

Inorganics, Method See Cover

Analyte	Concentration (ug/L)		RPD
	8	9	
Perchlorate	3.9	3.7	5

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\34894B6.wpd

LDC #: 34814B6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: 3D
2nd Reviewer: [illegible]

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of ClO4 was recalculated. Calibration date: 8/8/15

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	ClO4	s1	0.00	0	0.996839	0.995095	Y*
		s2	2	0.0017			
		s3	4	0.0035			
		s4	6	0.0052			
		s5	10	0.0092			
		s6	20	0.0166			
ICV 23:42 Calibration verification		Found 10.53 ug/L	True 10 ug/L		105%R	101%R	Y*
CCV 2:34 Calibration verification		8.15 ug/L	10 ug/L		81.5%R	86.2%R	Y*
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.

*Rounding... Area reported = not enough sigfigs

LDC #: 34894B6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

METHOD: Inorganics, Method See Cover

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

$\%R = \frac{Found}{True} \times 100$ 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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS 00:53	Laboratory control sample	ClO4	10.53ug/L	10ug/L	105%R	105%R	Y
MS 1:51	Matrix spike sample	↓	(SSR-SR) 9.34 ug/L	10.101 ug/L	93.4%R	97.4%R	Y*
MSD 2:05	Duplicate sample	↓	10.53 ug/L	9.34 ug/L	11.98 %RPD	3.93%RPD	Y*

Comments: * Rounding

TOTCLC.6

LDC #: 34884B6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 ND reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
	12	ClO4	ND	ND	Y

Note:

RECALC.6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: August 31, 2015

Parameters: Volatiles

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18537

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-3-072915	1518537-01	Water	07/29/15
EB-3-072915	1518537-02	Water	07/29/15
MW-17-4	1518537-03	Water	07/29/15
DUP-3-3Q15	1518537-04	Water	07/29/15
MW-17-3	1518537-05	Water	07/29/15
MW-17-2	1518537-06	Water	07/29/15
MW-18-5	1518537-07	Water	07/29/15
MW-18-4	1518537-08	Water	07/29/15
MW-18-3	1518537-09	Water	07/29/15
MW-18-2	1518537-10	Water	07/29/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). 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) Method 524.2

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): 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.

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.

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

Instrument performance was checked 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.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% 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.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all 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 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/01/15	Bromomethane 2,2-Dichloropropane Methyl iodide Pentachloroethane	61.3 34.5 45.8 46.9	All samples in SDG 15-18537	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P

V. Laboratory Blanks

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

VI. Field Blanks

Sample TB-3-072915 was identified as a trip blank. No contaminants were found.

Sample EB-3-072915 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

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

Samples MW-17-4 and DUP-3-3Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-17-4	DUP-3-3Q15	
Chloroform	0.24	0.19	23
Styrene	0.10	0.070	35
Trichloroethene	0.82	0.72	13

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 continuing calibration %D, data were qualified as estimated 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.

NASA JPL, 3Q2015
Volatiles - Data Qualification Summary - SDG 15-18537

Sample	Compound	Flag	A or P	Reason
TB-3-072915	Bromomethane	UJ (all non-detects)	P	Continuing calibration (%D)
EB-3-072915	2,2-Dichloropropane	UJ (all non-detects)		
MW-17-4	Methyl iodide	UJ (all non-detects)		
DUP-3-3Q15	Pentachloroethane	UJ (all non-detects)		
MW-17-3				
MW-17-2				
MW-18-5				
MW-18-4				
MW-18-3				
MW-18-2				

NASA JPL, 3Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-18537

No Sample Data Qualified in this SDG

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-3-072915

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-01	File ID:	31JUL76.D
Sampled:	07/29/15 06:15	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 09:31
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U US
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U US

8/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

TB-3-072915

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-01	File ID:	31JUL76.D
Sampled:	07/29/15 06:15	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 09:31
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-3-072915

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518537-01		File ID:	31JUL76.D
Sampled:	07/29/15 06:15	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 09:31
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.220	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6500	96.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	11.000	110	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190151	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	63483	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	270291	7.52	262686	7.52	

9/8/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-3-072915

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518537-02		File ID:	31JUL77.D
Sampled:	07/29/15 06:30	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 09:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-3-072915

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-02	File ID:	31JUL77.D
Sampled:	07/29/15 06:30	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 09:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-3-072915

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518537-02	File ID:	31JUL77.D
Sampled:	07/29/15 06:30	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 09:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.370	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.210	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.260	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	193861	6.74	192429	6.74	
Chlorobenzene-d5 (IS)	66200	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	260334	7.52	262686	7.52	

8/27/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-4

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518537-03	File ID:	31JUL78.D
Sampled:	07/29/15 08:00	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 10:16
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.24	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-4

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-03	File ID:	31JUL78.D
Sampled:	07/29/15 08:00	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 10:16
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.10	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.82	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-4

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518537-03	File ID:	31JUL78.D
Sampled:	07/29/15 08:00	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 10:16
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.520	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9100	99.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7600	97.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190412	6.74	192429	6.74	
Chlorobenzene-d5 (IS)	68187	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	265220	7.52	262686	7.52	

9/2/15 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-3-3Q15

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-04	File ID:	31JUL79.D
Sampled:	07/29/15 08:15	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 10:39
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.19	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-3-3Q15

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-04	File ID:	31JUL79.D
Sampled:	07/29/15 08:15	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 10:39
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.070	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.72	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

DUP-3-3Q15

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-04	File ID:	31JUL79.D
Sampled:	07/29/15 08:15	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 10:39
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.050	100	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9200	99.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.130	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191237	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	63452	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	260335	7.52	262686	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-3

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518537-05		File ID:	31JUL80.D
Sampled:	07/29/15 09:45	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 11:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.35	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.17	J
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

8/27/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-3

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-05	File ID:	31JUL80.D
Sampled:	07/29/15 09:45	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 11:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.31	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.61	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-3

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-05	File ID:	31JUL80.D
Sampled:	07/29/15 09:45	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 11:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.6500	96.5	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.030	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.290	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	188714	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	62913	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	256280	7.52	262686	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-2

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-06	File ID:	31JUL81.D
Sampled:	07/29/15 10:20	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 11:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.49	J
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-2

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-06	File ID:	31JUL81.D
Sampled:	07/29/15 10:20	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 11:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2653 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.24	J
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	1.2	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/8/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-2

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518537-06		File ID:	31JUL81.D
Sampled:	07/29/15 10:20	Prepared:	07/31/15 13:09	Analyzed:	08/01/15 11:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2653	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.370	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8600	98.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.540	105	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	189048	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	61845	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	260987	7.52	262686	7.52	

8/31/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-5

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518537-07	File ID:	31JUL82.D
Sampled:	07/29/15 11:40	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 11:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U US
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U US

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-5

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518537-07	File ID:	31JUL82.D
Sampled:	07/29/15 11:40	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 11:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.11	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-5

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-07	File ID:	31JUL82.D
Sampled:	07/29/15 11:40	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 11:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2654 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.430	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.130	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.020	100	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	187684	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	65606	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	262451	7.52	262686	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-4

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518537-08		File ID:	31JUL83.D
Sampled:	07/29/15 12:15	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 12:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	1.2	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.70	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-4

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-08	File ID:	31JUL83.D
Sampled:	07/29/15 12:15	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 12:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2654 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.73	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.95	
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-4

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518537-08		File ID:	31JUL83.D
Sampled:	07/29/15 12:15	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 12:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.440	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9500	99.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.270	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191817	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	62913	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	261099	7.52	262686	7.52	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-3

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1518537-09		File ID:	31JUL84.D
Sampled:	07/29/15 12:45	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 12:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	2.8	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.56	
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-3

Laboratory:	BC Laboratories			SDG:	15-18537
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1518537-09	File ID:	31JUL84.D
Sampled:	07/29/15 12:45	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 12:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence:	1512214	Calibration:	1507019
Instrument:	MS-V5				

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.26	J
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-3

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518537-09	File ID:	31JUL84.D
Sampled:	07/29/15 12:45	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 12:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.7700	97.7	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.010	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.420	104	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	193498	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	61859	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	256914	7.52	262686	7.52	

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-2

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518537-10	File ID:	31JUL85.D
Sampled:	07/29/15 13:20	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 12:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.083	U
108-86-1	Bromobenzene	1	0.13	U
74-97-5	Bromochloromethane	1	0.24	U
75-27-4	Bromodichloromethane	1	0.14	U
75-25-2	Bromoform	1	0.27	U
74-83-9	Bromomethane	1	0.25	U UJ
104-51-8	n-Butylbenzene	1	0.11	U
135-98-8	sec-Butylbenzene	1	0.15	U
98-06-6	tert-Butylbenzene	1	0.13	U
56-23-5	Carbon tetrachloride	1	0.18	U
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.12	U
74-87-3	Chloromethane	1	0.14	U
95-49-8	2-Chlorotoluene	1	0.20	U
106-43-4	4-Chlorotoluene	1	0.15	U
124-48-1	Dibromochloromethane	1	0.13	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.44	U
106-93-4	1,2-Dibromoethane	1	0.16	U
74-95-3	Dibromomethane	1	0.24	U
95-50-1	1,2-Dichlorobenzene	1	0.072	U
541-73-1	1,3-Dichlorobenzene	1	0.15	U
106-46-7	1,4-Dichlorobenzene	1	0.062	U
75-71-8	Dichlorodifluoromethane	1	0.099	U
75-34-3	1,1-Dichloroethane	1	0.11	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.18	U
156-59-2	cis-1,2-Dichloroethene	1	0.085	U
156-60-5	trans-1,2-Dichloroethene	1	0.15	U
78-87-5	1,2-Dichloropropane	1	0.13	U
142-28-9	1,3-Dichloropropane	1	0.086	U
594-20-7	2,2-Dichloropropane	1	0.13	U UJ

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-2

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518537-10	File ID:	31JUL85.D
Sampled:	07/29/15 13:20	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 12:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYG2654	Sequence: 1512214	Calibration:	1507019	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.085	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.079	U
100-41-4	Ethylbenzene	1	0.098	U
87-68-3	Hexachlorobutadiene	1	0.17	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.12	U
75-09-2	Methylene chloride	1	0.48	U
1634-04-4	Methyl t-butyl ether	1	0.11	U
91-20-3	Naphthalene	1	0.36	U
103-65-1	n-Propylbenzene	1	0.11	U
100-42-5	Styrene	1	0.068	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.18	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.13	U
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.16	U
120-82-1	1,2,4-Trichlorobenzene	1	0.19	U
71-55-6	1,1,1-Trichloroethane	1	0.11	U
79-00-5	1,1,2-Trichloroethane	1	0.16	U
79-01-6	Trichloroethene	1	0.085	U
75-69-4	Trichlorofluoromethane	1	0.13	U
96-18-4	1,2,3-Trichloropropane	1	0.24	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.15	U
95-63-6	1,2,4-Trimethylbenzene	1	0.12	U
108-67-8	1,3,5-Trimethylbenzene	1	0.12	U
75-01-4	Vinyl chloride	1	0.12	U
67-64-1	Acetone	1	4.6	U
107-13-1	Acrylonitrile	1	1.2	U
107-05-1	Allyl chloride	1	0.80	U
994-05-8	t-Amyl Methyl ether	1	0.25	U
75-65-0	t-Butyl alcohol	1	9.4	U

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:11:51PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-2

Laboratory:	BC Laboratories		SDG:	15-18537	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1518537-10	File ID:	31JUL85.D
Sampled:	07/29/15 13:20	Prepared:	07/31/15 13:12	Analyzed:	08/01/15 12:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYG2654 Sequence: 1512214 Calibration: 1507019 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.38	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.4	U
60-29-7	Diethyl ether	1	0.21	U
97-63-2	Ethyl methacrylate	1	0.97	U
637-92-3	Ethyl t-butyl ether	1	0.18	U
67-72-1	Hexachloroethane	1	0.16	U
591-78-6	2-Hexanone	1	3.4	U
126-98-7	Methacrylonitrile	1	1.7	U
78-93-3	Methyl ethyl ketone	1	2.5	U
74-88-4	Methyl iodide	1	0.47	U UJ
108-10-1	Methyl isobutyl ketone	1	2.1	U
80-62-6	Methyl methacrylate	1	1.5	U
76-01-7	Pentachloroethane	1	0.43	U UJ
107-12-0	Propionitrile	1	4.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.28	U
95-47-6	o-Xylene	1	0.082	U
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.8500	98.5	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8500	98.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.100	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	192294	6.73	192429	6.74	
Chlorobenzene-d5 (IS)	65517	9.72	64933	9.72	
1,4-Difluorobenzene (IS)	261540	7.52	262686	7.52	

9/21/15

LDC #: 34894C1

SDG #: 15-18537

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 8/31/15

Page: 1 of 2

Reviewer: MR

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

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 ≤ 20%, r² ICV ≤ 30%
IV.	Continuing calibration	SW	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 EB = 2
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	Client spec.
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	FD = 3 + 4
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	TB-3-072915	1518537-01	Water	07/29/15
2	EB-3-072915	1518537-02	Water	07/29/15
3	MW-17-4	1518537-03	Water	07/29/15
4	DUP-3-3Q15	1518537-04	Water	07/29/15
5	MW-17-3	1518537-05	Water	07/29/15
6	MW-17-2	1518537-06	Water	07/29/15
7 2	MW-18-5	1518537-07	Water	07/29/15
8 2	MW-18-4	1518537-08	Water	07/29/15
9 2	MW-18-3	1518537-09	Water	07/29/15
10 2	MW-18-2	1518537-10	Water	07/29/15
11				
12				
13				

LDC #: 34894C1

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 8/31/15

SDG #: 15-18537

Page: 2 of 2

Laboratory: BC Laboratories, Inc.

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				
17				
18				
19				
20				

Notes:

1	BYG2653-BLK1						
2	BYG2654-BLK1						

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. Methyl iodide
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Pentachloroethane
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1.
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 #: 34894C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: Rx
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)
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 all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0%)	Associated Samples	Qualifications
	8/1/15	CCV - 31JUL15	B	61.3	All	J/UJ/P(ND)
			OU	34.5		↓
			V1	45.8		
			W1	46.9		

LDC #: 34894C1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: BR
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (µg/L)		RPD
	3	4	
K	0.24	0.19	23
FF	0.10	0.070	35
S	0.82	0.72	13

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: August 30, 2015

Parameters: Chromium

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18531

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-3-072915	1518537-02	Water	07/29/15
MW-17-4	1518537-03	Water	07/29/15
DUP-3-3Q15	1518537-04	Water	07/29/15
MW-17-3	1518537-05	Water	07/29/15
MW-17-2	1518537-06	Water	07/29/15
MW-18-4	1518537-08	Water	07/29/15
MW-18-3	1518537-09	Water	07/29/15
MW-18-2	1518537-10	Water	07/29/15
EB-3-072915MS	1518537-02MS	Water	07/29/15
EB-3-072915MSD	1518537-02MSD	Water	07/29/15
EB-3-072915DUP	1518537-02DUP	Water	07/29/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Chromium by Environmental Protection Agency (EPA) Method 200.8

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): 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.

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.

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 method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

ICP Interference check sample (ICS) analysis data were not required by the method.

V. Laboratory Blanks

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

VI. Field Blanks

Sample EB-3-072915 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
EB-3-072915	Chromium	2.3

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. Duplicate Sample Analysis

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

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

XI. Field Duplicates

Samples MW-17-4 and DUP-3-3Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-17-4	DUP-3-3Q15	
Chromium	1.6	1.4	13

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 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.

NASA JPL, 3Q2015
Chromium - Data Qualification Summary - SDG 15-18531

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-18531

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:13:45PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

EB-3-072915

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-02
File ID: PE_EL2_150803-027
Sampled: 07/29/15 06:30
Prepared: 07/31/15 09:40
Analyzed: 08/03/15 11:20
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2696
Sequence: 1512384
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.3	1	J	EPA-200.8

9/1/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:13:45PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-17-4

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-03
File ID: PE_EL2_150803-099
Sampled: 07/29/15 08:00
Prepared: 07/31/15 09:40
Analyzed: 08/03/15 15:55
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2696
Sequence: 1512384
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.6	1	J	EPA-200.8

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:13:45PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

DUP-3-3Q15

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-04
File ID: PE_EL2_150803-100
Sampled: 07/29/15 08:15
Prepared: 07/31/15 09:40
Analyzed: 08/03/15 15:59
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2696
Sequence: 1512384
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.4	1	J	EPA-200.8

9/8/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:13:45PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-17-3

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-05
File ID: PE_EL2_150803-101
Sampled: 07/29/15 09:45
Prepared: 07/31/15 09:40
Analyzed: 08/03/15 16:02
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2696
Sequence: 1512384
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.8	1	J	EPA-200.8

9/3/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:13:45PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-17-2

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-06
File ID: PE_EL2_150803-102
Sampled: 07/29/15 10:20
Prepared: 07/31/15 09:40
Analyzed: 08/03/15 16:06
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2696
Sequence: 1512384
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.72	1	J	EPA-200.8

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:13:45PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-18-4

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-08
File ID: PE_EL2_150803-103
Sampled: 07/29/15 12:15
Prepared: 07/31/15 09:40
Analyzed: 08/03/15 16:09
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2696
Sequence: 1512384
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.1	1	J	EPA-200.8

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:13:45PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-18-3

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-09
File ID: PE_EL2_150803-104
Sampled: 07/29/15 12:45
Prepared: 07/31/15 09:40
Analyzed: 08/03/15 16:13
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2696
Sequence: 1512384
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.4	1	J	EPA-200.8

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:13:45PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-18-2

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-10
File ID: PE_EL2_150803-105
Sampled: 07/29/15 13:20
Prepared: 07/31/15 09:40
Analyzed: 08/03/15 16:16
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYG2696
Sequence: 1512384
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.72	1	J	EPA-200.8

9/1/15

LDC #: 34894C4a

SDG #: 15-18531

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 8/27/15

Page: 1 of 1

Reviewer: JD

2nd Reviewer: [illegible]

METHOD: ~~Metals~~ CX (EPA Method 200.8) JD

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	7/29/15
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not Required
V.	Laboratory Blanks	A	
VI.	Field Blanks	SW	EB=(1)
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(9,10)
VIII.	Duplicate sample analysis	A	DUP
IX.	ICP Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	FD=(2,3)
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	EB-3-072915	1518537-02	Water	07/29/15
2	MW-17-4	1518537-03	Water	07/29/15
3	DUP-3-3Q15	1518537-04	Water	07/29/15
4	MW-17-3	1518537-05	Water	07/29/15
5	MW-17-2	1518537-06	Water	07/29/15
6	MW-18-4	1518537-08	Water	07/29/15
7	MW-18-3	1518537-09	Water	07/29/15
8	MW-18-2	1518537-10	Water	07/29/15
9	EB-3-072915MS	1518537-02MS	Water	07/29/15
10	EB-3-072915MSD	1518537-02MSD	Water	07/29/15
11	EB-3-072915DUP	1518537-02DUP	Water	07/29/15
12				
13				
14				
15				

LDC #: 34894C4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?

Sample: 1 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

Analyte	Concentration Units (ug/L)
Cr	2.3

LDC#: 34894C4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: JO

2nd Reviewer: G

METHOD: Metals (EPA Method 6010B/7000)

Y N NA Were field duplicate pairs identified in this SDG?

Y N NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (ug/L)		RPD
	2	3	
Chromium	1.6	1.4	13

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 3Q2015

LDC Report Date: August 30, 2015

Parameters: Wet Chemistry

Validation Level: Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-18537

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-3-072915	1518537-02	Water	07/29/15
MW-17-4	1518537-03	Water	07/29/15
DUP-3-3Q15	1518537-04	Water	07/29/15
MW-17-3	1518537-05	Water	07/29/15
MW-17-2	1518537-06	Water	07/29/15
MW-18-5	1518537-07	Water	07/29/15
MW-18-4	1518537-08	Water	07/29/15
MW-18-3	1518537-09	Water	07/29/15
MW-18-2	1518537-10	Water	07/29/15
EB-3-072915MS	1518537-02MS	Water	07/29/15
EB-3-072915MSD	1518537-02MSD	Water	07/29/15
EB-3-072915DUP	1518537-02DUP	Water	07/29/15

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7196
Perchlorate by EPA Method 314.0

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): 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.

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.

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

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

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

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Hexavalent chromium	0.0012270 mg/L	EB-3-072915 MW-17-4 DUP-3-3Q15 MW-17-3 MW-17-2 MW-18-4 MW-18-3 MW-18-2
ICB/CCB	Hexavalent chromium	0.0012780 mg/L	EB-3-072915 MW-17-4 DUP-3-3Q15 MW-17-3 MW-17-2
ICB/CCB	Hexavalent chromium	0.00090800 mg/L	MW-18-4 MW-18-3 MW-18-2

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 (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
EB-3-072915	Hexavalent chromium	0.0012 mg/L	0.0012U mg/L
MW-17-4	Hexavalent chromium	0.00083 mg/L	0.00083U mg/L
DUP-3-3Q15	Hexavalent chromium	0.0013 mg/L	0.0013U mg/L
MW-17-2	Hexavalent chromium	0.0010 mg/L	0.0010U mg/L
MW-18-4	Hexavalent chromium	0.0018 mg/L	0.0018U mg/L
MW-18-3	Hexavalent chromium	0.0026 mg/L	0.0026U mg/L
MW-18-2	Hexavalent chromium	0.00086 mg/L	0.00086U mg/L

V. Field Blanks

Sample EB-3-072915 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (mg/L)
EB-3-072915	Hexavalent chromium	0.0012

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. Duplicates

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 methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples MW-17-4 and DUP-3-3Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-17-4	DUP-3-3Q15	
Perchlorate	2.4 ug/L	2.5 ug/L	4
Hexavalent chromium	0.00083 mg/L	0.0013 mg/L	44

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 methods. No results were rejected in this SDG.

Due to laboratory 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. Based upon the data validation all results are considered valid and usable for all purposes.

NASA JPL, 3Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-18537

No Sample Data Qualified in this SDG

NASA JPL, 3Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-18537

Sample	Analyte	Modified Final Concentration	A or P
EB-3-072915	Hexavalent chromium	0.0012U mg/L	A
MW-17-4	Hexavalent chromium	0.00083U mg/L	A
DUP-3-3Q15	Hexavalent chromium	0.0013U mg/L	A
MW-17-2	Hexavalent chromium	0.0010U mg/L	A
MW-18-4	Hexavalent chromium	0.0018U mg/L	A
MW-18-3	Hexavalent chromium	0.0026U mg/L	A
MW-18-2	Hexavalent chromium	0.00086U mg/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

EB-3-072915

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-02
File ID: 150730 0343 CR6-005
Sampled: 07/29/15 06:30
Prepared: 07/30/15 03:43
Analyzed: 07/30/15 03:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2546
Sequence: 1512313
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0012	1	JB U	EPA-7196

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-17-4

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-03
File ID: 150730 0343 CR6-009
Sampled: 07/29/15 08:00
Prepared: 07/30/15 03:43
Analyzed: 07/30/15 03:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2546
Sequence: 1512313
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00083	1	JB U	EPA-7196

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

DUP-3-3Q15

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-04
File ID: 150730 0343 CR6-010
Sampled: 07/29/15 08:15
Prepared: 07/30/15 03:43
Analyzed: 07/30/15 03:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2546
Sequence: 1512313
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0013	1	JB U	EPA-7196

9/1/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-17-3

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-05
File ID: 150730 0343 CR6-011
Sampled: 07/29/15 09:45
Prepared: 07/30/15 03:43
Analyzed: 07/30/15 03:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2546
Sequence: 1512313
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00070	1	U	EPA-7196

9/8/15 r

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-17-2

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-06
File ID: 150730 0343 CR6-012
Sampled: 07/29/15 10:20
Prepared: 07/30/15 03:43
Analyzed: 07/30/15 03:43
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2546
Sequence: 1512313
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0010	1	JB U	EPA-7196

9/1/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-18-4

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-08
File ID: 150730 0343 CR6-015
Sampled: 07/29/15 12:15
Prepared: 07/30/15 03:43
Analyzed: 07/30/15 03:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2546
Sequence: 1512313
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0018	1	JB U	EPA-7196

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-18-3

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-09
File ID: 150730 0343 CR6-016
Sampled: 07/29/15 12:45
Prepared: 07/30/15 03:43
Analyzed: 07/30/15 03:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2546
Sequence: 1512313
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0026	1	B U	EPA-7196

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-18-2

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-10
File ID: 150730 0343 CR6-017
Sampled: 07/29/15 13:20
Prepared: 07/30/15 03:43
Analyzed: 07/30/15 03:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYG2546
Sequence: 1512313
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00086	1	JB U	EPA-7196

9/1/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-3-072915

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-02
File ID: F081315.seq-9.0000.txt
Sampled: 07/29/15 06:30
Prepared: 08/13/15 15:30
Analyzed: 08/13/15 16:37
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1225
Sequence: 1513133
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-17-4

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-03RE1
File ID: F081315.seq-26.0000.txt
Sampled: 07/29/15 08:00
Prepared: 08/13/15 15:30
Analyzed: 08/14/15 01:18
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1225
Sequence: 1513133
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.4	1	J	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

DUP-3-3Q15

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-04
File ID: F081315.seq-14.0000.txt
Sampled: 07/29/15 08:15
Prepared: 08/13/15 15:30
Analyzed: 08/13/15 18:48
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1225
Sequence: 1513133
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.5	1	J	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-17-3

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-05
File ID: F081315.seq-17.0000.txt
Sampled: 07/29/15 09:45
Prepared: 08/13/15 15:30
Analyzed: 08/13/15 19:41
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1225
Sequence: 1513133
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-17-2

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-06
File ID: F081315.seq-33.0000.txt
Sampled: 07/29/15 10:20
Prepared: 08/13/15 15:30
Analyzed: 08/14/15 02:59
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1225
Sequence: 1513133
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.2	1	J	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-5

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-07
File ID: F081315.seq-34.0000.txt
Sampled: 07/29/15 11:40
Prepared: 08/13/15 15:30
Analyzed: 08/14/15 03:13
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1225
Sequence: 1513133
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-4

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-08
File ID: F081315.seq-20.0000.txt
Sampled: 07/29/15 12:15
Prepared: 08/13/15 15:30
Analyzed: 08/13/15 20:42
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1225
Sequence: 1513133
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	15	1		EPA-314.0

9/21/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 8/24/2015 5:12:49PM
Project: JPL- GW Monitoring Wells
Project Number: 3Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-3

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-09
File ID: F081315.seq-21.0000.txt
Sampled: 07/29/15 12:45
Prepared: 08/13/15 15:30
Analyzed: 08/13/15 21:06
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1225
Sequence: 1513133
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	14	1		EPA-314.0

9/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065	Reported: 8/24/2015 5:12:49PM Project: JPL- GW Monitoring Wells Project Number: 3Q15 Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-2

Laboratory: BC Laboratories
SDG: 15-18537
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1518537-10RE1
File ID: F081315.seq-32.0000.txt
Sampled: 07/29/15 13:20
Prepared: 08/13/15 15:30
Analyzed: 08/14/15 02:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYH1225
Sequence: 1513133
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.3	1	U	EPA-314.0

9/2/15

LDC #: 34894C6 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/27/15
SDG #: 15-18537 Level III Page: 1 of 1
Laboratory: BC Laboratories, Inc. Reviewer: JD
2nd Reviewer: [illegible]

METHOD: (Analyte) Hexavalent Chromium (EPA SW846 Method 7196), Perchlorate (EPA Method 314.0)

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	7/29/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB=(1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(10,11)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	FD=(2,3)
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	EB-3-072915	ClO_4 Cr^{+6}	1518537-02	Water	07/29/15
2	MW-17-4		1518537-03	Water	07/29/15
3	DUP-3-3Q15		1518537-04	Water	07/29/15
4	MW-17-3		1518537-05	Water	07/29/15
5	MW-17-2		1518537-06	Water	07/29/15
6	MW-18-5		1518537-07	Water	07/29/15
7	MW-18-4	Cr^{+6}	1518537-08	Water	07/29/15
8	MW-18-3		1518537-09	Water	07/29/15
9	MW-18-2		1518537-10	Water	07/29/15
10	EB-3-072915MS	Cr^{+6} ClO_4	1518537-02MS	Water	07/29/15
11	EB-3-072915MSD		1518537-02MSD	Water	07/29/15
12	EB-3-072915DUP		1518537-02DUP	Water	07/29/15
13					
14					

Notes:

LDC #: 34854C6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Parameter
1-5, 7-9	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
6	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
QC: 10-12	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4
	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments:

LDC #: 34894C6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 3D
2nd Reviewer: CL

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 1-5, 7-9

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		1	2	3	5	7	8	9			
Hexavalent Chromium	0.0012270		0.006135	0.0012	0.00083	0.0013	0.0010	0.0018	0.0026	0.00086			

Conc. units: mg/L **Associated Samples:** 1-5

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		1	2	3	4	5					
Hexavalent Chromium		0.0012780	0.00639	See PB	See PB	See PB	See PB	See PB					

Conc. units: mg/L **Associated Samples:** 7-9

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		7	8	8							
Hexavalent Chromium		0.00090800	0.00454	See PB	See PB	See PB							

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 #: 34894C6

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: JD
2nd reviewer: a

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

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?

Sample: 1 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

Analyte	Concentration Units (mg/L)
Cr+6	0.0012

LDC#: 34894C6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: SD
2nd Reviewer: ar

Inorganics, Method See Cover

Analyte	Concentration		RPD
	2	3	
Perchlorate	2.4 ug/L	2.5 ug/L	4
Hexavalent Chromum	0.00083 mg/L	0.0013 mg/L	44

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\34894C6.wpd

From: Pei Geng
To: Cutie, Betsy
Cc: Walton, Shane S
Subject: RE: LDC report 34928F6
Date: Thursday, November 19, 2015 12:21:39 PM

Hi Betsy,

Yes, it is ok and the statement just means that the data is not perfect and was estimated due to MS/MSD finding.

Thanks!

Pei Geng
Senior Chemist/Project Manager
pgeng@lab-data.com
Laboratory Data Consultants, Inc.
Data Validation, ADR, Custom Software, and Database Management
Main Office:
2701 Loker Ave. West, Suite 220
Carlsbad, CA 92010
Main Phone: 760-827-1100 extension 141
LDC Hours: M-Th 7am-5pm, F 7am-2pm
My Hours: M-Th 9:00am-5:30pm, F 8am-2pm

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From: Cutie, Betsy [mailto:CutieE@battelle.org]
Sent: Thursday, November 19, 2015 9:07 AM
To: Pei Geng <pgeng@lab-data.com>
Cc: Walton, Shane S <waltons@battelle.org>
Subject: LDC report 34928F6

Hi Pei,

I'm reviewing LDC reports and this one stood out because of the statement "data is usable for limited purposes". The perchlorate MS/MSDs were a little above range, but didn't look that bad to me.

Can you let us know if the perchlorate data is ok for reporting to the client?

Thanks,
Betsy

Betsy Cutie
QA Officer
Environment & Agriculture
Office: 614.424.4899 | Fax: 614.458.4899
cutiee@battelle.org

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Columbus, OH 43201
http://www.battelle.org

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