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

March 20, 2015

SUBJECT: NASA JPL, 1Q2015, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on February 27, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33812:

SDG #	Fraction
15-01955, 15-02061, 15-02185, 15-02304	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

Pei Geng
Project Manager/Senior Chemist

HC

Attachment 1

90/10 (client select) LDC #33812 (Tidewater- Powell, OH / NASA JPL, 1Q2015)

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)		Cr(VI) (7196)		O-PO_4 (365.1)		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	15-01955	02/27/15	03/20/15	12	0	5	0	-	-	-	-	5	0	-	-	11	0																				
A	15-01955	02/27/15	03/20/15	1	0	1	0	-	-	-	-	1	0	-	-	1	0																				
B	15-02061	02/27/15	03/20/15	9	0	7	0	1	0	1	0	7	0	1	0	8	0																				
B	15-02061	02/27/15	03/20/15	1	0	1	0	0	0	0	0	1	0	0	0	1	0																				
C	15-02185	02/27/15	03/20/15	7	0	5	0	-	-	-	-	5	0	-	-	6	0																				
C	15-02185	02/27/15	03/20/15	2	0	2	0	-	-	-	-	2	0	-	-	2	0																				
D	15-02304	02/27/15	03/20/15	10	0	9	0	-	-	-	-	9	0	-	-	9	0																				
D	15-02304	02/27/15	03/20/15	1	0	1	0	-	-	-	-	1	0	-	-	1	0																				
Total	T/PG			43	0	31	0	1	0	1	0	31	0	1	0	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	147

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\33812ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 19, 2015

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-01955

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-1-01/26/15	1501955-01	Water	01/26/15
SB-1-01/26/15	1501955-02	Water	01/26/15
EB-1-01/26/15	1501955-03	Water	01/26/15
MW-20-5	1501955-04	Water	01/26/15
MW-20-4**	1501955-05**	Water	01/26/15
MW-20-3	1501955-06	Water	01/26/15
MW-20-2	1501955-07	Water	01/26/15
MW-19-5	1501955-08	Water	01/26/15
MW-19-4	1501955-09	Water	01/26/15
MW-19-3	1501955-10	Water	01/26/15
Dup-1-1Q15	1501955-11	Water	01/26/15
MW-19-2	1501955-12	Water	01/26/15
MW-19-1	1501955-13	Water	01/26/15

**Indicates sample underwent EPA 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 with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
01/22/15	Pentachloroethane	33.1	All samples in SDG 15-01955	UJ (all non-detects)	P

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%.

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-1-01/26/15 was identified as a trip blank. No contaminants were found.

Sample EB-1-01/26/15 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Compound	Concentration (ug/L)
EB-1-01/26/15	Toluene	0.11

Sample SB-1-01/26/15 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Compound	Concentration (ug/L)
SB-1-01/26/15	Toluene	0.13

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-19-3 and Dup-1-1Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-19-3	Dup-1-1Q15	
Chloroform	0.37	0.34	8
Tetrachloroethene	0.62	0.60	3
Trichloroethene	0.14	0.11	24

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 ICV %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, 1Q2015
Volatiles - Data Qualification Summary - SDG 15-01955

Sample	Compound	Flag	A or P	Reason
TB-1-01/26/15 SB-1-01/26/15 EB-1-01/26/15 MW-20-5 MW-20-4** MW-20-3 MW-20-2 MW-19-5 MW-19-4 MW-19-3 Dup-1-1Q15 MW-19-2 MW-19-1	Pentachloroethane	UJ (all non-detects)	P	Initial calibration verification (%D)

NASA JPL, 1Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-01955

No Sample Data Qualified in this SDG

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-1-01/26/15

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-01	File ID:	29JAN31.D
Sampled:	01/26/15 06:45	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 18:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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

3/30/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-1-01/26/15

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-01	File ID:	29JAN31.D
Sampled:	01/26/15 06:45	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 18:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-1-01/26/15

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-01	File ID:	29JAN31.D
Sampled:	01/26/15 06:45	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 18:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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
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	10.840	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.130	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6400	86.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	204709	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	74726	9.58	68850	9.58	
1,4-Difluorobenzene (IS)	283924	7.33	275218	7.33	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-1-01/26/15

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-02	File ID:	29JAN32.D
Sampled:	01/26/15 07:00	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 18:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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

2/23/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-1-01/26/15

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-02	File ID:	29JAN32.D
Sampled:	01/26/15 07:00	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 18:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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	0.13	J
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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-1-01/26/15

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-02	File ID:	29JAN32.D
Sampled:	01/26/15 07:00	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 18:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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
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	10.800	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8200	98.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9900	89.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	208664	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	71608	9.59	68850	9.58	
1,4-Difluorobenzene (IS)	285458	7.33	275218	7.33	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-1-01/26/15

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-03	File ID:	29JAN33.D
Sampled:	01/26/15 07:05	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 18:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence:	1501553	Calibration:	1501018
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

2/23/15

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

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-1-01/26/15

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-03	File ID:	29JAN33.D
Sampled:	01/26/15 07:05	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 18:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence:	1501553	Calibration:	1501018	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	0.11	J
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

3/20/15

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-1-01/26/15

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-03	File ID:	29JAN33.D
Sampled:	01/26/15 07:05	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 18:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence:	1501553	Calibration:	1501018	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
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	11.420	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.120	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1200	91.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	204556	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	71991	9.58	68850	9.58	
1,4-Difluorobenzene (IS)	282290	7.33	275218	7.33	

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-5

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-04	File ID:	29JAN34.D
Sampled:	01/26/15 07:40	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 19:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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

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

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-5

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-04	File ID:	29JAN34.D
Sampled:	01/26/15 07:40	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 19:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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	0.31	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

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-5

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-04	File ID:	29JAN34.D
Sampled:	01/26/15 07:40	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 19:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence: 1501553	Calibration:	1501018	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
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	11.740	117	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8500	98.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9900	89.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	200260	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	73470	9.58	68850	9.58	
1,4-Difluorobenzene (IS)	284980	7.33	275218	7.33	

2/23/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-4

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-05	File ID:	29JAN35.D
Sampled:	01/26/15 08:20	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 19:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence:	1501553	Calibration:	1501018	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.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-4

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-05	File ID:	29JAN35.D
Sampled:	01/26/15 08:20	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 19:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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

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

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-4

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-05	File ID:	29JAN35.D
Sampled:	01/26/15 08:20	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 19:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence: 1501553	Calibration:	1501018	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
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	10.940	109	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9500	99.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9200	89.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	207393	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	73697	9.58	68850	9.58	
1,4-Difluorobenzene (IS)	283343	7.33	275218	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-3

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-06	File ID:	29JAN36.D
Sampled:	01/26/15 09:00	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 20:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-3

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-06	File ID:	29JAN36.D
Sampled:	01/26/15 09:00	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 20:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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	0.14	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	0.41	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	0.26	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	2.4	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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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-3

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-06	File ID:	29JAN36.D
Sampled:	01/26/15 09:00	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 20:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence: 1501553	Calibration:	1501018	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
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	11.170	112	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8400	98.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7800	87.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	199909	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	71799	9.58	68850	9.58	
1,4-Difluorobenzene (IS)	280139	7.33	275218	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-2

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-07	File ID:	29JAN37.D
Sampled:	01/26/15 09:40	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 20:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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	0.34	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	0.15	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	0.085	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: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-2

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-07	File ID:	29JAN37.D
Sampled:	01/26/15 09:40	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 20:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence: 1501553	Calibration:	1501018	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	0.38	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	2.2	
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

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-20-2

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-07	File ID:	29JAN37.D
Sampled:	01/26/15 09:40	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 20:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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
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	11.150	112	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9800	99.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8100	88.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	200156	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	69775	9.59	68850	9.58	
1,4-Difluorobenzene (IS)	278423	7.33	275218	7.33	

8/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-5

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-08	File ID:	29JAN38.D
Sampled:	01/26/15 10:40	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 20:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence:	1501553	Calibration:	1501018	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	0.26	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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-5

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-08	File ID:	29JAN38.D
Sampled:	01/26/15 10:40	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 20:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence:	1501553	Calibration:	1501018	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	0.75	
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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-5

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-08	File ID:	29JAN38.D
Sampled:	01/26/15 10:40	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 20:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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
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 UT
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	10.920	109	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8700	98.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9400	89.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	208857	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	72341	9.58	68850	9.58	
1,4-Difluorobenzene (IS)	283400	7.33	275218	7.33	

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-4

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-09	File ID:	29JAN39.D
Sampled:	01/26/15 11:20	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 21:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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	0.23	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

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-4

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-09	File ID:	29JAN39.D
Sampled:	01/26/15 11:20	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 21:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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	0.44	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

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-4

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-09	File ID:	29JAN39.D
Sampled:	01/26/15 11:20	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 21:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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
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	10.600	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.010	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9400	89.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	207743	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	70078	9.59	68850	9.58	
1,4-Difluorobenzene (IS)	276421	7.33	275218	7.33	

8/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-3

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-10	File ID:	29JAN40.D
Sampled:	01/26/15 11:55	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 21:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence: 1501553	Calibration:	1501018	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	0.37	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

3/28/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-3

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-10	File ID:	29JAN40.D
Sampled:	01/26/15 11:55	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 21:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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	0.62	
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

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-3

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-10	File ID:	29JAN40.D
Sampled:	01/26/15 11:55	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 21:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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
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	11.050	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8500	98.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1300	91.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	197394	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	68886	9.58	68850	9.58	
1,4-Difluorobenzene (IS)	274149	7.33	275218	7.33	

3/25/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-1-1Q15

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-11	File ID:	29JAN41.D
Sampled:	01/26/15 12:10	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 21:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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	0.34	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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-1-1Q15

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-11	File ID:	29JAN41.D
Sampled:	01/26/15 12:10	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 21:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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	0.60	
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

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-1-1Q15

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-11	File ID:	29JAN41.D
Sampled:	01/26/15 12:10	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 21:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence: 1501553	Calibration:	1501018	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
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	11.280	113	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.030	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0600	90.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	200748	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	73651	9.59	68850	9.58	
1,4-Difluorobenzene (IS)	282429	7.33	275218	7.33	

8/25/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-2

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-12	File ID:	29JAN42.D
Sampled:	01/26/15 13:00	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 22:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence: 1501553	Calibration:	1501018	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	0.31	J
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	1.1	
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	0.31	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	0.25	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

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-2

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-12	File ID:	29JAN42.D
Sampled:	01/26/15 13:00	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 22:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence:	1501553	Calibration:	1501018	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	1.3	
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

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-2

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-12	File ID:	29JAN42.D
Sampled:	01/26/15 13:00	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 22:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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
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	11.120	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8800	98.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0800	90.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	201186	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	72761	9.58	68850	9.58	
1,4-Difluorobenzene (IS)	284160	7.33	275218	7.33	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-1

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-13	File ID:	29JAN43.D
Sampled:	01/26/15 13:35	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 22:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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	0.48	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

3/23/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-1

Laboratory:	BC Laboratories		SDG:	15-01955	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1501955-13	File ID:	29JAN43.D
Sampled:	01/26/15 13:35	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 22:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2419 Sequence: 1501553 Calibration: 1501018 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

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:57:34AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-19-1

Laboratory:	BC Laboratories			SDG:	15-01955
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1501955-13	File ID:	29JAN43.D
Sampled:	01/26/15 13:35	Prepared:	01/29/15 12:00	Analyzed:	01/29/15 22:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2419	Sequence:	1501553	Calibration:	1501018
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
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	11.080	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.160	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9900	89.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	201716	6.51	194365	6.51	
Chlorobenzene-d5 (IS)	70749	9.58	68850	9.58	
1,4-Difluorobenzene (IS)	276775	7.33	275218	7.33	

3/20/15

LDC #: 33812A1

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/6/15

SDG #: 15-01955

Page: 1 of 2

Laboratory: BC Laboratories, Inc.

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 / SW	RSD ≤ 20?, r² / ICV ≤ 30?
IV.	Continuing calibration	A	CCV ≤ 30?
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	TB = 1* SB = 2 EB = 3
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	Client spec.
IX.	Laboratory control samples	A A	LCS
X.	Field duplicates	SW	FD = 10 + 11
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-1-01/26/15	1501955-01	Water	01/26/15
2	SB-1-01/26/15	1501955-02	Water	01/26/15
3	EB-1-01/26/15	1501955-03	Water	01/26/15
4	MW-20-5	1501955-04	Water	01/26/15
5	MW-20-4**	1501955-05**	Water	01/26/15
6	MW-20-3	1501955-06	Water	01/26/15
7	MW-20-2	1501955-07	Water	01/26/15
8	MW-19-5	1501955-08	Water	01/26/15
9	MW-19-4	1501955-09	Water	01/26/15
10	MW-19-3	1501955-10	Water	01/26/15
11	Dup-1-1Q15	1501955-11	Water	01/26/15
12	MW-19-2	1501955-12	Water	01/26/15
13	MW-19-1	1501955-13	Water	01/26/15

LDC #: 33812A1

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/6/15

SDG #: 15-01955

Page: 2 of 2

Laboratory: BC Laboratories, Inc.

Reviewer: KM

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				
17				
18				

Notes:

T	BYA 2419-B2K1						

LDC #: 33812A1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: 9

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 #: 33812A1

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	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Pentachloroethane
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33812A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: BR
2nd Reviewer: Q

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 an initial calibration verification standard analyzed after each ICAL for each instrument?

Y (N) N/A Were all %D within the validation criteria of ≤30 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	1/22/15	ICV - MS-V5	PPPP	33.1	All	J/UJ/P (ND)

LDC #: 33812A1

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: KR
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) Source Blank

Compound	Concentration Units (ug/L)
CC	0-13

Sample: 3 Field Blank / Trip Blank / Rinsate (circle one) EB

Compound	Concentration Units (ug/L)
CC	0-11

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

Compound	Concentration Units ( )

LDC #: 33812A1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
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
	10	11	
K	0.37	0.34	8
AA	0.62	0.60	3
S	0.14	0.11	24

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 33812A1

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	1/22/2015	1,1-Dichloroethene (IS1)	0.953157	0.953157	0.9317342	0.9317342	12.88825	12.88825
	MS-V5		Trichloroethene (IS2)	0.353078	0.353078	0.3347186	0.3347186	11.84779	11.84778
			1,1,2,2-Tetrachloethane	0.642118	0.642118	0.6044214	0.6044215	5.315305	5.315310

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 #: 33812A1

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	1/22/2015	Allyl chloride (IS1)	0.711435	0.711435	0.716758	0.716758	7.687894	7.687887
	MS-V5		Methyl methacrylate (IS	0.091910	0.091910	0.09828363	0.09828363	12.8917	12.8917
			Pentachloroethane (IS3	0.690898	0.690898	0.6701268	0.6701268	3.859368	3.859352

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#: 33812A1

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	29JAN20	1/29/2015	1,1-Dichloroethene (IS1)	0.931734	0.920180	0.920180	1.2	1.2
			Trichloroethene (IS2)	0.334719	0.3207356	0.3207356	4.2	4.2
			1,1,2,2-Tetrachloethane	0.604421	0.5839372	0.5839372	3.4	3.4
2	29JAN21	1/29/2015	Allyl chloride (IS1)	0.716758	0.773808	0.773808	8.0	8.0
			Methyl methacrylate (IS2	0.098284	0.09357446	0.09357446	4.8	4.8
			Pentachloroethane (IS3	0.670127	0.7571532	0.7571532	13.0	13.0

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 #: 33812A1

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: 5

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.00	9.95	99.5	99.5	0
Bromofluorobenzene	↓	8.92	89.2	89.2	0
1,2-Dichlorobenzene-d4		10.94	109	109	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 #: 33812A1

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: BYA2419-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	—	27.980	—	112	112				
Trichloroethene			26.390		106	106				
Benzene			26.640		107	107				
Toluene			26.070		104	104				
Chlorobenzene			25.840		103	103				

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 #: 33812A1

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 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. ~~F~~ 5, G:

G = 0.39

Conc. = $\frac{(13458)(10)(\quad)}{(207393)(1.662155)(\quad)}$

= 0.39 04045 85 µg/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 19, 2015

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-01955

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SB-1-01/26/15	1501955-02	Water	01/26/15
EB-1-01/26/15	1501955-03	Water	01/26/15
MW-20-5	1501955-04	Water	01/26/15
MW-20-4**	1501955-05**	Water	01/26/15
MW-20-3	1501955-06	Water	01/26/15
MW-20-2	1501955-07	Water	01/26/15

**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 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 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. 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(s).

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

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of ICS analysis was met. All criteria were within QC limits.

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	0.914 ug/L	All samples in SDG 15-01955
ICB/CCB	Chromium	0.57000 ug/L	All samples in SDG 15-01955

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
SB-1-01/26/15	Chromium	0.77 ug/L	0.77U ug/L
EB-1-01/26/15	Chromium	1.0 ug/L	1.0U ug/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-20-5	Chromium	0.93 ug/L	0.93U ug/L
MW-20-4**	Chromium	1.9 ug/L	1.9U ug/L
MW-20-3	Chromium	1.0 ug/L	1.0U ug/L
MW-20-2	Chromium	0.73 ug/L	0.73U ug/L

VI. Field Blanks

Sample EB-1-01/26/15 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
EB-1-01/26/15	Chromium	1.0

Sample SB-1-01/26/15 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
SB-1-01/26/15	Chromium	0.77

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. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

X. Laboratory Control Samples (LCS)

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)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

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 six samples.

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, 1Q2015
Chromium - Data Qualification Summary - SDG 15-01955

No Sample Data Qualified in this SDG

NASA JPL, 1Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-01955

Sample	Analyte	Modified Final Concentration	A or P
SB-1-01/26/15	Chromium	0.77U ug/L	A
EB-1-01/26/15	Chromium	1.0U ug/L	A
MW-20-5	Chromium	0.93U ug/L	A
MW-20-4**	Chromium	1.9U ug/L	A
MW-20-3	Chromium	1.0U ug/L	A
MW-20-2	Chromium	0.73U ug/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:02:00AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

SB-1-01/26/15

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-02
File ID: PE_EL2_150129-094
Sampled: 01/26/15 07:00
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 17:51
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2388
Sequence: 1501593
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.77	1	J	EPA-200.8

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:02:00AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-1-01/26/15

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-03
File ID: PE_EL2_150129-095
Sampled: 01/26/15 07:05
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 17:54
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2388
Sequence: 1501593
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.0	1	J	EPA-200.8

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:02:00AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-5

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-04
File ID: PE_EL2_150129-096
Sampled: 01/26/15 07:40
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 17:58
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2388
Sequence: 1501593
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 U	EPA-200.8

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:02:00AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-4

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-05
File ID: PE_EL2_150129-097
Sampled: 01/26/15 08:20
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 18:01
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2388
Sequence: 1501593
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 U	EPA-200.8

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:02:00AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-3

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-06
File ID: PE_EL2_150129-098
Sampled: 01/26/15 09:00
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 18:05
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2388
Sequence: 1501593
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.0	1	J VI	EPA-200.8

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:02:00AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-20-2

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-07
File ID: PE_EL2_150129-099
Sampled: 01/26/15 09:40
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 18:08
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2388
Sequence: 1501593
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.73	1	J U	EPA-200.8

3/20/15

LDC #: 33812A4a

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/13/15

SDG #: 15-01955

Page: 1 of 1

Laboratory: BC Laboratories, Inc.

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	1/26/15
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	SB=(1) EB=(2)
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	N	
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	SB-1-01/26/15	1501955-02	Water	01/26/15
2	EB-1-01/26/15	1501955-03	Water	01/26/15
3	MW-20-5	1501955-04	Water	01/26/15
4	MW-20-4**	1501955-05**	Water	01/26/15
5	MW-20-3	1501955-06	Water	01/26/15
6	MW-20-2	1501955-07	Water	01/26/15
7				
8				
9				
10				
11				
12				

Notes:

LDC #: 33812A4c

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: CV

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

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

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

LDC #: 33812A4a

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)**	**Action Level**	1	2	3	4	5	6					
Cr		0.914	0.57000	4.57	0.77	1.0	0.93	1.9	1.0	0.73					

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 #: 33812A4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: SD
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 SB (circle one)

Analyte	Concentration Units (ug/l)
Cr	0.77

Sample: 2 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

Analyte	Concentration Units (ug/l)
Cr	1.0

LDC #: 33882A49

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

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

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

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

$\%R = \frac{Found}{True} \times 100$ 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 12:37	ICP/MS (Initial calibration)	Cr	52.48 ug/L	50 ug/L	105%R	105%R	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV 18:13	ICP/MS (Continuing calibration)	Cr	43.168 ug/L	40 ug/L	108%R	108%R	Y
	CVAA (Continuing calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments: _____

CALCLC.4SW

LDC #: 33812A4a

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/a	ICP interference check						
LCS 17:00	Laboratory control sample	Cr	45.165 ug/L	40 ug/L	113%R	113%R	Y
N	Matrix spike		(SSR-SR)				
N	Duplicate						
N	ICP serial dilution						

Comments: _____

TOTCLC.4SW

LDC #: 35812A4a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JSD
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 (4) Cr were recalculated and verified using the following equation:

Concentration = (RD)(FV)(Dil) / (In. Vol.)

Recalculation:

RD = 1.9 ug/L

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

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	4	Cr	1.9	1.9	Y

Note:

RECALC.4SW

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 19, 2015

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-01955

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SB-1-01/26/15	1501955-02	Water	01/26/15
EB-1-01/26/15	1501955-03	Water	01/26/15
MW-20-5	1501955-04	Water	01/26/15
MW-20-4**	1501955-05**	Water	01/26/15
MW-20-3	1501955-06	Water	01/26/15
MW-20-2	1501955-07	Water	01/26/15
MW-19-5	1501955-08	Water	01/26/15
MW-19-4	1501955-09	Water	01/26/15
MW-19-3	1501955-10	Water	01/26/15
Dup-1-1Q15	1501955-11	Water	01/26/15
MW-19-2	1501955-12	Water	01/26/15
MW-19-1	1501955-13	Water	01/26/15
SB-1-01/26/15MS	1501955-02MS	Water	01/26/15
SB-1-01/26/15MSD	1501955-02MSD	Water	01/26/15
SB-1-01/26/15DUP	1501955-02DUP	Water	01/26/15

**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 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:

Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7196
Perchlorate by Environmental Protection Agency (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 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. 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 method(s). No contaminants were found in the laboratory blanks with the following exceptions:

Laboratory Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Hexavalent Chromium	0.0010790 mg/L	All samples in SDG 15-01955
ICB/CCB	Hexavalent Chromium	0.011780 mg/L	SB-1-01/26/15 EB-1-01/26/15 MW-20-5 MW-20-4** MW-20-3
ICB/CCB	Hexavalent Chromium	0.0011900 mg/L	MW-20-2

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
SB-1-01/26/15	Hexavalent Chromium	0.0011 mg/L	0.0011U mg/L
EB-1-01/26/15	Hexavalent Chromium	0.0011 mg/L	0.0011U mg/L
MW-20-5	Hexavalent Chromium	0.0012 mg/L	0.0012U mg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-20-4**	Hexavalent Chromium	0.0014 mg/L	0.0014U mg/L
MW-20-3	Hexavalent Chromium	0.00097 mg/L	0.00097U mg/L
MW-20-2	Hexavalent Chromium	0.0012 mg/L	0.0012U mg/L

V. Field Blanks

Sample EB-1-01/26/15 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (mg/L)
EB-1-01/26/15	Hexavalent Chromium	0.0011

Sample SB-1-01/26/15 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (mg/L)
SB-1-01/26/15	Hexavalent Chromium	0.0011

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 method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples MW-19-3 and Dup-1-1Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-19-3	Dup-1-1Q15	
Perchlorate	3.5	3.9	11

X. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XI. 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 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.

Analyte	Concentration (ug/L)		RPD
	MW-19-3	Dup-1-1Q15	
Perchlorate	3.5	3.9	11

X. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XI. 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 six samples.

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, 1Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-01955

No Sample Data Qualified in this SDG

NASA JPL, 1Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-01955

Sample	Analyte	Modified Final Concentration	A or P
SB-1-01/26/15	Hexavalent Chromium	0.0011U mg/L	A
EB-1-01/26/15	Hexavalent Chromium	0.0011U mg/L	A
MW-20-5	Hexavalent Chromium	0.0012U mg/L	A
MW-20-4**	Hexavalent Chromium	0.0014U mg/L	A
MW-20-3	Hexavalent Chromium	0.00097U mg/L	A
MW-20-2	Hexavalent Chromium	0.0012U mg/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

SB-1-01/26/15

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-02
File ID: F020215.seq-42.0000.txt
Sampled: 01/26/15 07:00
Prepared: 02/02/15 23:00
Analyzed: 02/03/15 19:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0332
Sequence: 1501940
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

3/20/15

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Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

EB-1-01/26/15

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-03
File ID: F020215.seq-46.0000.txt
Sampled: 01/26/15 07:05
Prepared: 02/02/15 23:00
Analyzed: 02/03/15 20:01
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0332
Sequence: 1501940
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

3/20/15 [illegible]

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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-20-5

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-04
File ID: F020215.seq-47.0000.txt
Sampled: 01/26/15 07:40
Prepared: 02/02/15 23:00
Analyzed: 02/03/15 20:15
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0332
Sequence: 1501940
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

2/20/15

Tidewater Inc.
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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-20-4

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-05
File ID: F020215.seq-48.0000.txt
Sampled: 01/26/15 08:20
Prepared: 02/02/15 23:00
Analyzed: 02/03/15 20:28
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0332
Sequence: 1501940
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

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Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-20-3

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-06
File ID: F020215.seq-49.0000.txt
Sampled: 01/26/15 09:00
Prepared: 02/02/15 23:00
Analyzed: 02/03/15 20:42
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0332
Sequence: 1501940
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

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Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-20-2

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-07
File ID: F020215.seq-52.0000.txt
Sampled: 01/26/15 09:40
Prepared: 02/02/15 23:00
Analyzed: 02/03/15 21:24
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0332
Sequence: 1501940
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	7.0	1		EPA-314.0

2/20/15

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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-19-5

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-08
File ID: F020215.seq-53.0000.txt
Sampled: 01/26/15 10:40
Prepared: 02/02/15 23:00
Analyzed: 02/03/15 21:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0332
Sequence: 1501940
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.7	1	J	EPA-314.0

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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-4

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-09
File ID: F020215.seq-54.0000.txt
Sampled: 01/26/15 11:20
Prepared: 02/02/15 23:00
Analyzed: 02/03/15 21:52
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0332
Sequence: 1501940
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.5	1	J	EPA-314.0

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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-3

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-10
File ID: F020215.seq-55.0000.txt
Sampled: 01/26/15 11:55
Prepared: 02/02/15 23:00
Analyzed: 02/03/15 22:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0332
Sequence: 1501940
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	3.5	1	J	EPA-314.0

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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

Dup-1-1Q15

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-11
File ID: F020215.seq-56.0000.txt
Sampled: 01/26/15 12:10
Prepared: 02/02/15 23:00
Analyzed: 02/03/15 22:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0332
Sequence: 1501940
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

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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-2

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-12
File ID: F020215.seq-57.0000.txt
Sampled: 01/26/15 13:00
Prepared: 02/02/15 23:00
Analyzed: 02/03/15 22:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0203
Sequence: 1501940
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	5.2	1		EPA-314.0

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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-19-1

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-13
File ID: F020215.seq-58.0000.txt
Sampled: 01/26/15 13:35
Prepared: 02/02/15 23:00
Analyzed: 02/03/15 22:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0203
Sequence: 1501940
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

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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

SB-1-01/26/15

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-02
File ID: 150126 2155 CR6-005
Sampled: 01/26/15 07:00
Prepared: 01/26/15 21:55
Analyzed: 01/26/15 21:55
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2103
Sequence: 1501406
Calibration: UNASSIGNED
Instrument: KONE-1

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

3/2015 RC 8

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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-1-01/26/15

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-03
File ID: 150126 2155 CR6-009
Sampled: 01/26/15 07:05
Prepared: 01/26/15 21:55
Analyzed: 01/26/15 21:55
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2103
Sequence: 1501406
Calibration: UNASSIGNED
Instrument: KONE-1

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

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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-20-5

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-04
File ID: 150126 2155 CR6-010
Sampled: 01/26/15 07:40
Prepared: 01/26/15 21:55
Analyzed: 01/26/15 21:55
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2103
Sequence: 1501406
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

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-4

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-05
File ID: 150126 2155 CR6-011
Sampled: 01/26/15 08:20
Prepared: 01/26/15 21:55
Analyzed: 01/26/15 21:55
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2103
Sequence: 1501406
Calibration: UNASSIGNED
Instrument: KONE-1

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

2/20/15

Tidewater Inc.
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Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-3

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-06
File ID: 150126 2155 CR6-012
Sampled: 01/26/15 09:00
Prepared: 01/26/15 21:55
Analyzed: 01/26/15 21:55
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2103
Sequence: 1501406
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00097	1	JB U	EPA-7196

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 9:59:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-20-2

Laboratory: BC Laboratories
SDG: 15-01955
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1501955-07
File ID: 150126 2155 CR6-015
Sampled: 01/26/15 09:40
Prepared: 01/26/15 21:55
Analyzed: 01/26/15 21:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2103
Sequence: 1501406
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

LDC #: 33812A6

SDG #: 15-01955

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/13/15

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	1/26/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	SB=(1) EB=(2)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(13,14)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	FD=(9,10)
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	SB-1-01/26/15	1501955-02	Water	01/26/15
2	EB-1-01/26/15	1501955-03	Water	01/26/15
3	MW-20-5	1501955-04	Water	01/26/15
4	MW-20-4**	1501955-05**	Water	01/26/15
5	MW-20-3	1501955-06	Water	01/26/15
6	MW-20-2	1501955-07	Water	01/26/15
7	MW-19-5	1501955-08	Water	01/26/15
8	MW-19-4	1501955-09	Water	01/26/15
9	MW-19-3	1501955-10	Water	01/26/15
10	Dup-1-1Q15	1501955-11	Water	01/26/15
11	MW-19-2	1501955-12	Water	01/26/15
12	MW-19-1	1501955-13	Water	01/26/15
13	SB-1-01/26/15MS Cr+6 ClO4	1501955-02MS	Water	01/26/15
14	SB-1-01/26/15MSD	1501955-02MSD	Water	01/26/15
15	SB-1-01/26/15DUP	1501955-02DUP	Water	01/26/15
16				
17				

Result = rounded = not enough sig figs reported

LDC #: 33812A4

VALIDATION FINDINGS CHECKLIST

Reviewer: JD
2nd Reviewer: OR

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 #: 33802A10

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
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 #: 33802A6

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
DC13+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
	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 #: 33812A6

VALIDATION FINDINGS WORKSHEET
Blanks

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

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				
Hexavalent Chromium	0.0010790		0.005395	0.0011	0.0011	0.0012	0.0014	0.00097	0.0012				

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		0.011780	0.0589	See PB	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)		6									
Hexavalent Chromium		0.0011900	0.00595	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 #: 33812A6

VALIDATION FINDINGS WORKSHEET
Field Blanks

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 SB (circle one)

Analyte	Concentration Units (mg/L)
Cr+6	0.0011

Sample: 2 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

Analyte	Concentration Units (mg/L)
Cr+6	0.0011

LDC# 33812A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: SD
2nd Reviewer: a

Inorganics: Method See Cover

Analyte	Concentration (ug/L)		RPD
	9	10	
Perchlorate	3.5	3.9	11

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33812A6.wpd

LDC #: 33842A6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 11/14/15

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	0.001	0.99993	0.99994	y*
		s2	0.002	0.003			
		s3	0.005	0.005			
		s4	0.025	0.019			
		s5	0.05	0.038			
		s6	0.1	0.075			
ICV Calibration verification	Cr^{+6}	Found 0.049mg/l	True 0.05mg/l		98%R	n/a	n/a
ICV 00:27 Calibration verification	ClO_4	10ug/l	10ug/l		100%R	102%R	y*
CCV 18:10 Calibration verification	ClO_4	11ug/l	10ug/l		111%R	105%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 #: 33812A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: JO
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	Laboratory control sample	ClO4	11 ug/L	10 ug/L	111%R	108%R	Y*
MS	Matrix spike sample	Cr^{+6}	(SSR-SR) 0.0541 mg/L	0.052632 mg/L	103%R	103%R	Y
MSD	Duplicate sample	Cr^{+6}	0.05542 ~~0.054~~ mg/L	0.05542 mg/L	0% RPD	0.196% RPD	Y*

Comments: *Rounding

TOTCLC.6

LDC #: 33812A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

METHOD: Inorganics, Method See Cover

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

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

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

Concentration = [A-(bias)] x m

Recalculation: (0.002-0.001) 1.35 = 0.00135 ≈ 0.0014 mg/L

A=0.002
bias=0.001
m=1.35

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	4	Cr^{+6}	0.0014	0.0014	Y

Note:

RECALC.6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 19, 2015

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02061

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-2-01/27/15	1502061-01	Water	01/27/15
EB-2-01/27/15	1502061-02	Water	01/27/15
MW-14-5	1502061-03	Water	01/27/15
MW-14-4	1502061-04	Water	01/27/15
MW-14-3	1502061-05	Water	01/27/15
MW-14-2	1502061-06	Water	01/27/15
MW-14-1	1502061-07	Water	01/27/15
MW-24-3	1502061-09	Water	01/27/15
MW-24-2**	1502061-10**	Water	01/27/15
MW-24-1	1502061-11	Water	01/27/15
MW-14-3MS	1502061-05MS	Water	01/27/15
MW-14-3MSD	1502061-05MSD	Water	01/27/15
MW-14-3DUP	1502061-05DUP	Water	01/27/15

**Indicates sample underwent EPA 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 with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
01/22/15	Pentachloroethane	33.1	All samples in SDG 15-02061	UJ (all non-detects)	P

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% with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
01/22/15	Bromomethane Methyl Iodide Pentachloroethane	51.2 52.1 96.8	All samples in SDG 15-02061	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-2-01/27/15 was identified as a trip blank. No contaminants were found.

Sample EB-2-01/27/15 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.

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 ICV %D and 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, 1Q2015
Volatiles - Data Qualification Summary - SDG 15-02061

Sample	Compound	Flag	A or P	Reason
TB-2-01/27/15 EB-2-01/27/15 MW-14-5 MW-14-4 MW-14-3 MW-14-2 MW-14-1 MW-24-3 MW-24-2** MW-24-1	Pentachloroethane	UJ (all non-detects)	P	Initial calibration verification (%D)
TB-2-01/27/15 EB-2-01/27/15 MW-14-5 MW-14-4 MW-14-3 MW-14-2 MW-14-1 MW-24-3 MW-24-2** MW-24-1	Bromomethane Methyl Iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 1Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-02061

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-2-01/27/15

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-01	File ID:	29JAN65.D
Sampled:	01/27/15 06:45	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 07:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2421	Sequence:	1501553	Calibration:	1501018	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 UT
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-2-01/27/15

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-01	File ID:	29JAN65.D
Sampled:	01/27/15 06:45	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 07:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-2-01/27/15

Laboratory:	BC Laboratories		SDG:	15-02061	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502061-01	File ID:	29JAN65.D
Sampled:	01/27/15 06:45	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 07:00
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	10.700	107	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7800	97.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2100	92.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	212117	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	73316	9.58	74947	9.59	
1,4-Difluorobenzene (IS)	300829	7.33	292698	7.33	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-2-01/27/15

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-02	File ID:	29JAN57.D
Sampled:	01/27/15 07:15	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 03:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-2-01/27/15

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-02	File ID:	29JAN57.D
Sampled:	01/27/15 07:15	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 03:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-2-01/27/15

Laboratory:	BC Laboratories		SDG:	15-02061	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502061-02	File ID:	29JAN57.D
Sampled:	01/27/15 07:15	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 03:59
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2421	Sequence: 1501553	Calibration:	1501018	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	11.040	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.110	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2300	92.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	209719	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	72770	9.58	74947	9.59	
1,4-Difluorobenzene (IS)	288857	7.33	292698	7.33	

8/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-5

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-03	File ID:	29JAN58.D
Sampled:	01/27/15 07:40	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 04:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	0.43	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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-5

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-03	File ID:	29JAN58.D
Sampled:	01/27/15 07:40	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 04:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-5

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-03	File ID:	29JAN58.D
Sampled:	01/27/15 07:40	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 04:21
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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
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	11.030	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9300	99.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.5300	85.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	210395	6.52	204969	6.51	
Chlorobenzene-d5 (IS)	74997	9.59	74947	9.59	
1,4-Difluorobenzene (IS)	290069	7.33	292698	7.33	

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-4

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-04	File ID:	29JAN59.D
Sampled:	01/27/15 08:20	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 04:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2421	Sequence:	1501553	Calibration:	1501018	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	0.26	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	0.11	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	0.18	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	0.15	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

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-4

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-04	File ID:	29JAN59.D
Sampled:	01/27/15 08:20	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 04:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	0.36	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	0.33	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: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-4

Laboratory:	BC Laboratories		SDG:	15-02061	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502061-04	File ID:	29JAN59.D
Sampled:	01/27/15 08:20	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 04:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2421	Sequence: 1501553	Calibration:	1501018	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	11.190	112	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9700	99.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0400	90.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	208497	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	73019	9.58	74947	9.59	
1,4-Difluorobenzene (IS)	285749	7.33	292698	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-3

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-05	File ID:	29JAN56.D
Sampled:	01/27/15 08:55	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 03:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	0.71	
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	0.43	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	0.21	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: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-3

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-05	File ID:	29JAN56.D
Sampled:	01/27/15 08:55	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 03:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	0.96	
108-88-3	Toluene	1	0.093	U
87-61-6	1,2,3-Trichlorobenzene	1	0.20	J
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	2.2	
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

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-3

Laboratory:	BC Laboratories		SDG:	15-02061	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502061-05	File ID:	29JAN56.D
Sampled:	01/27/15 08:55	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 03:36
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2421	Sequence: 1501553	Calibration:	1501018	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	11.360	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.020	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2600	92.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	203084	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	72505	9.59	74947	9.59	
1,4-Difluorobenzene (IS)	287558	7.33	292698	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-2

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-06	File ID:	29JAN60.D
Sampled:	01/27/15 09:40	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 05:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	0.52	
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	0.14	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: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-2

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-06	File ID:	29JAN60.D
Sampled:	01/27/15 09:40	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 05:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	0.36	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	3.2	
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

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

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-2

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-06	File ID:	29JAN60.D
Sampled:	01/27/15 09:40	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 05:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	10.960	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9000	99.0	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7100	87.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	203620	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	74040	9.58	74947	9.59	
1,4-Difluorobenzene (IS)	286454	7.33	292698	7.33	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-1

Laboratory:	BC Laboratories		SDG:	15-02061	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502061-07	File ID:	29JAN61.D
Sampled:	01/27/15 10:15	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 05:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2421	Sequence: 1501553	Calibration:	1501018	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	0.48	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	0.14	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

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-1

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-07	File ID:	29JAN61.D
Sampled:	01/27/15 10:15	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 05:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	0.37	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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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-14-1

Laboratory:	BC Laboratories		SDG:	15-02061	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502061-07	File ID:	29JAN61.D
Sampled:	01/27/15 10:15	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 05:29
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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 US
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	11.040	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.040	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6500	86.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	204789	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	73796	9.58	74947	9.59	
1,4-Difluorobenzene (IS)	281613	7.33	292698	7.33	

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

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-3

Laboratory:	BC Laboratories		SDG:	15-02061	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502061-09	File ID:	29JAN62.D
Sampled:	01/27/15 12:00	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 05:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2421	Sequence: 1501553	Calibration:	1501018	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

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

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-3

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-09	File ID:	29JAN62.D
Sampled:	01/27/15 12:00	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 05:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	0.18	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.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-3

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-09	File ID:	29JAN62.D
Sampled:	01/27/15 12:00	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 05:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	11.300	113	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8900	98.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7700	87.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	204346	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	74050	9.58	74947	9.59	
1,4-Difluorobenzene (IS)	286467	7.33	292698	7.33	

2/23/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-2

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-10	File ID:	29JAN63.D
Sampled:	01/27/15 13:00	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 06:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	0.42	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	0.53	
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	0.080	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	0.21	J
107-06-2	1,2-Dichloroethane	1	0.24	J
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: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-2

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-10	File ID:	29JAN63.D
Sampled:	01/27/15 13:00	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 06:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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

3/25/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-2

Laboratory:	BC Laboratories		SDG:	15-02061	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502061-10	File ID:	29JAN63.D
Sampled:	01/27/15 13:00	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 06:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	11.200	112	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9400	99.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8400	88.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	211521	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	75508	9.58	74947	9.59	
1,4-Difluorobenzene (IS)	288831	7.33	292698	7.33	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-1

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-11	File ID:	29JAN64.D
Sampled:	01/27/15 13:40	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 06:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	1.2	
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	0.98	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	3.5	
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

3/25/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-1

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-11	File ID:	29JAN64.D
Sampled:	01/27/15 13:40	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 06:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	0.36	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	1.2	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

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:03:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-24-1

Laboratory:	BC Laboratories			SDG:	15-02061
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502061-11	File ID:	29JAN64.D
Sampled:	01/27/15 13:40	Prepared:	01/29/15 14:03	Analyzed:	01/30/15 06:37
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2421 Sequence: 1501553 Calibration: 1501018 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	11.090	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8400	98.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9800	89.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	211406	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	74622	9.58	74947	9.59	
1,4-Difluorobenzene (IS)	295280	7.33	292698	7.33	

3/25/15 [illegible]

LDC #: 33812B1

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/6/15

SDG #: 15-02061

Page: 1 of 2

Laboratory: BC Laboratories, Inc.

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 / SW	RSD ≤ 20%, r 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-2-01/27/15	1502061-01	Water	01/27/15
2	EB-2-01/27/15	1502061-02	Water	01/27/15
3	MW-14-5	1502061-03	Water	01/27/15
4	MW-14-4	1502061-04	Water	01/27/15
5	MW-14-3	1502061-05	Water	01/27/15
6	MW-14-2	1502061-06	Water	01/27/15
7	MW-14-1	1502061-07	Water	01/27/15
8	MW-24-3	1502061-09	Water	01/27/15
9	MW-24-2**	1502061-10**	Water	01/27/15
10	MW-24-1	1502061-11	Water	01/27/15
11	MW-14-3MS	1502061-05MS	Water	01/27/15
12	MW-14-3MSD	1502061-05MSD	Water	01/27/15
13	~~MW-14-3DUP~~	1502061-05DUP	Water	01/27/15

LDC #: 33812B1

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/6/15

SDG #: 15-02061

Page: 2 of 2

Laboratory: BC Laboratories, Inc.

Reviewer: BL

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				
17				
18				

Notes:

T	BYA2421-BLK1						

LDC #: 33812B1

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 #: 37812B1

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	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Pentachloroethane
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Methyl iodid
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33812B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: BK
2nd Reviewer: 9

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 an initial calibration verification standard analyzed after each ICAL for each instrument?
Y N N/A Were all %D within the validation criteria of ≤30 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	1/22/15	ICV-MS-VS	PPPP	33.1	All	J/UJ/P (NO)

LDC #: 33812B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: BR
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
	1/22/15	CCV - 29JAN51	B	51.2	All	J/UJ/P
		CCV - 29JAN52	QQQQ	52.1		(ND)
		↓	PPPP	96.8		↓

CONCAL.1S5

LDC #: 33812B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: 4

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	1/22/2015	1,1-Dichloroethene (IS1)	0.953157	0.953157	0.9317342	0.9317342	12.88825	12.88825
	MS-V5		Trichloroethene (IS2)	0.353078	0.353078	0.3347186	0.3347186	11.84779	11.84778
			1,1,2,2-Tetrachloethane	0.642118	0.642118	0.6044214	0.6044215	5.315305	5.315310

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 #: 33812B1

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	1/22/2015	Allyl chloride (IS1)	0.711435	0.711435	0.716758	0.716758	7.687894	7.687887
	MS-V5		Methyl methacrylate (IS	0.091910	0.091910	0.09828363	0.09828363	12.8917	12.8917
			Pentachloroethane (IS3	0.690898	0.690898	0.6701268	0.6701268	3.859368	3.859352

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#: 33812B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

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	29JAN51	1/30/2015	1,1-Dichloroethene (IS1)	0.931734	0.862326	0.862326	7.4	7.4
			Trichloroethene (IS2)	0.334719	0.3200304	0.3200304	4.4	4.4
			1,1,2,2-Tetrachloethane	0.604421	0.5514826	0.5514826	8.8	8.8
2	29JAN52	1/30/2015	Allyl chloride (IS1)	0.716758	0.731144	0.731144	2.0	2.0
			Methyl methacrylate (IS2	0.098284	0.09269751	0.09269751	5.7	5.7
			Pentachloroethane (IS3	0.670127	0.0217654	0.0217654	96.8	96.8

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 #: 33812B1

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: F 10

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.00	9.94	99.4	99.4	0
Bromofluorobenzene		8.84	88.4	88.4	0
1,2-Dichlorobenzene-d4		11.20	112	112	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#: 33812B1

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: 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	
	MS	MSD	------	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
1,1-Dichloroethene	25.00	25.00	0	25.870	25.560	103%	103.5%	102%	102.2%	1.21%	1.21%
Trichloroethene	25.00	25.00	2.18	26.730	26.480	98.2%	98.2%	97.2%	97.2%	0.940%	0.940%
Benzene	25.00	25.00	0	25.280	24.250	101%	101%	97.0%	97.0%	4.16%	4.16%
Toluene	25.00	25.00	0	25.120	25.040	100%	100.5%	100%	100.2%	0.319%	0.319%
Chlorobenzene	25.00	25.00	0	24.830	24.680	99.3%	99.3%	98.7%	98.7%	0.606%	0.606%

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 #: 33812B1

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: BYA2421-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	—	25.320	—	101	101				
Trichloroethene			24.290		97.2	97.2				
Benzene			24.790		99.2	99.2				
Toluene			24.400		97.6	97.6				
Chlorobenzene			22.960		91.8	91.8				

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 #: 33812B1

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: k = 0.53

Sample I.D. 10, K:

Conc. = $\frac{(11150)(10)(\quad)(\quad)}{(211521)(0.985587)(\quad)}$

= 0.532487019 ug/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 19, 2015

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02061

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-2-01/27/15	1502061-02	Water	01/27/15
MW-14-3	1502061-05	Water	01/27/15
MW-14-2	1502061-06	Water	01/27/15
MW-14-1	1502061-07	Water	01/27/15
MW-24-4	1502061-08	Water	01/27/15
MW-24-3	1502061-09	Water	01/27/15
MW-24-2**	1502061-10**	Water	01/27/15
MW-24-1	1502061-11	Water	01/27/15
MW-14-3MS	1502061-05MS	Water	01/27/15
MW-14-3MSD	1502061-05MSD	Water	01/27/15
MW-14-3DUP	1502061-05DUP	Water	01/27/15

**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 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 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. 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(s).

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

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of ICS analysis was met. All criteria were within QC limits.

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
ICB/CCB	Chromium	0.66600 ug/L	All samples in SDG 15-02061

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-2-01/27/15	Chromium	1.2 ug/L	1.2U ug/L
MW-14-3	Chromium	0.84 ug/L	0.84U ug/L
MW-14-2	Chromium	1.2 ug/L	1.2U ug/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-24-4	Chromium	1.4 ug/L	1.4U ug/L
MW-24-3	Chromium	1.1 ug/L	1.1U ug/L
MW-24-2**	Chromium	2.2 ug/L	2.2U ug/L

VI. Field Blanks

Sample EB-2-01/27/15 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
EB-2-01/27/15	Chromium	1.2

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. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

X. Laboratory Control Samples (LCS)

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)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

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 six samples.

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, 1Q2015
Chromium - Data Qualification Summary - SDG 15-02061

No Sample Data Qualified in this SDG

NASA JPL, 1Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-02061

Sample	Analyte	Modified Final Concentration	A or P
EB-2-01/27/15	Chromium	1.2U ug/L	A
MW-14-3	Chromium	0.84U ug/L	A
MW-14-2	Chromium	1.2U ug/L	A
MW-24-4	Chromium	1.4U ug/L	A
MW-24-3	Chromium	1.1U ug/L	A
MW-24-2**	Chromium	2.2U ug/L	A

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:05:39AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-2-01/27/15

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-02
File ID: PE_EL2_150129-072
Sampled: 01/27/15 07:15
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 16:24
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2389
Sequence: 1501594
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:05:39AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-14-3

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-05
File ID: PE_EL2_150129-063
Sampled: 01/27/15 08:55
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 15:50
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2389
Sequence: 1501594
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.84	1	J U	EPA-200.8

8/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:05:39AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-14-2

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-06
File ID: PE_EL2_150129-073
Sampled: 01/27/15 09:40
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 16:27
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2389
Sequence: 1501594
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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:05:39AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-14-1

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-07
File ID: PE_EL2_150129-074
Sampled: 01/27/15 10:15
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 16:31
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2389
Sequence: 1501594
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	6.4	1		EPA-200.8

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:05:39AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-24-4

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-08
File ID: PE_EL2_150129-075
Sampled: 01/27/15 11:15
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 16:34
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2389
Sequence: 1501594
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

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:05:39AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-24-3

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-09
File ID: PE_EL2_150129-076
Sampled: 01/27/15 12:00
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 16:38
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2389
Sequence: 1501594
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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:05:39AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-24-2

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-10
File ID: PE_EL2_150129-077
Sampled: 01/27/15 13:00
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 16:41
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2389
Sequence: 1501594
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 U	EPA-200.8

3/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:05:39AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-24-1

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-11
File ID: PE_EL2_150129-078
Sampled: 01/27/15 13:40
Prepared: 01/29/15 08:20
Analyzed: 01/29/15 16:44
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYA2389
Sequence: 1501594
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	8.5	1		EPA-200.8

2/20/15

LDC #: 33812B4a

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/13/15

SDG #: 15-02061

Page: 1 of 1

Laboratory: BC Laboratories, Inc.

Reviewer: SD

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	1/27/15
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)
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(9,10)
VIII.	Duplicate sample analysis	A	DUP = ok by diff
IX.	ICP Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	A	
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-2-01/27/15	1502061-02	Water	01/27/15
2	MW-14-3	1502061-05	Water	01/27/15
3	MW-14-2	1502061-06	Water	01/27/15
4	MW-14-1	1502061-07	Water	01/27/15
5	MW-24-4	1502061-08	Water	01/27/15
6	MW-24-3	1502061-09	Water	01/27/15
7	MW-24-2**	1502061-10**	Water	01/27/15
8	MW-24-1	1502061-11	Water	01/27/15
9	MW-14-3MS	1502061-05MS	Water	01/27/15
10	MW-14-3MSD	1502061-05MSD	Water	01/27/15
11	MW-14-3DUP	1502061-05DUP	Water	01/27/15
12				
13				

Notes:

LDC #: 33812B4m

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
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 #: 33812B4

VALIDATION FINDINGS CHECKLIST

Reviewer: JJ
2nd Reviewer: a

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 #: 33812B4a

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)**	**Action Level**	1	2	3	5	6	7					
Cr			0.66600	3.33	1.2	0.84	1.2	1.4	1.1	2.2					

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 #: 33812B4a

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

Analyte	Concentration Units (ug/l)
Cr	1.2

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

Analyte	Concentration Units ( )

LDC #: 35812B4a

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: J.D
2nd Reviewer: 9

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

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

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

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 12:37	ICP/MS (Initial calibration)	Cr	52.488 ug/L	50 ug/L	105%R	105%R	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV 16:15	ICP/MS (Continuing calibration)	Cr	43.069 ug/L	40 ug/L	108%R	108%R	Y
	CVAA (Continuing calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments:

CALCLC.4SW

LDC #: 33812B4q

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 15:43	Laboratory control sample	Cr	43.538 ug/L	40 ug/L	109%R	109%R	Y
MS 15:57	Matrix spike	Cr	(SSR-SR) 40.94 ug/L	40 ug/L	102%R	102%R	↓
DUP 15:54	Duplicate	Cr	1.169 ug/L	0.838 ug/L	33%RPD	33.0%RPD	↓
SER 15:47	ICP serial dilution	Cr	~~0.83~~ ND	0.838 ug/L	NC	NC	↓

Comments: _____

TOTCLC.4SW

LDC #: 33812B49

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 = (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 = 2.2 ug/L

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	7	Cr	2.2	2.2	Y

Note:

RECALC.4SW

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 20, 2015

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02061

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-2-01/27/15	1502061-02	Water	01/27/15
MW-14-5	1502061-03	Water	01/27/15
MW-14-4	1502061-04	Water	01/27/15
MW-14-3	1502061-05	Water	01/27/15
MW-14-2	1502061-06	Water	01/27/15
MW-14-1	1502061-07	Water	01/27/15
MW-24-4	1502061-08	Water	01/27/15
MW-24-3	1502061-09	Water	01/27/15
MW-24-2**	1502061-10**	Water	01/27/15
MW-24-1	1502061-11	Water	01/27/15
MW-14-3MS	1502061-05MS	Water	01/27/15
MW-14-3MSD	1502061-05MSD	Water	01/27/15
MW-14-3DUP	1502061-05DUP	Water	01/27/15
MW-24-1MS	1502061-11MS	Water	01/27/15
MW-24-1MSD	1502061-11MSD	Water	01/27/15
MW-24-1DUP	1502061-11DUP	Water	01/27/15

**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 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:

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 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. 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 method(s). No contaminants were found in the laboratory blanks with the following exceptions:

Laboratory Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Orthophosphate as P	0.0072410 mg/L	MW-24-1
ICB/CCB	Orthophosphate as P	0.00994 mg/L	MW-24-1

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-24-1	Orthophosphate as P	0.016 mg/L	0.016U mg/L

V. Field Blanks

Sample EB-2-01/27/15 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 method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XI. Overall Assessment of Data

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

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

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. 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, 1Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-02061

No Sample Data Qualified in this SDG

NASA JPL, 1Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-02061

Sample	Analyte	Modified Final Concentration	A or P
MW-24-1	Orthophosphate as P	0.016U mg/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:45:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-300.0

MW-24-1

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-11
File ID: H012715A.seq-35
Sampled: 01/27/15 13:40
Prepared: 01/28/15 01:30
Analyzed: 01/28/15 09:55
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2239
Sequence: 1501571
Calibration: UNASSIGNED
Instrument: IC8

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	84	1		EPA-300.0
14797-55-8	Nitrate as N	1.3	1		EPA-300.0
14808-79-8	Sulfate	46	1		EPA-300.0

8/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:45:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-353.2

MW-24-1

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-11
File ID: 150128 0748 NO2-019
Sampled: 01/27/15 13:40
Prepared: 01/28/15 07:48
Analyzed: 01/28/15 07:48
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2209
Sequence: 1501561
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

8/20/15 A

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:45:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-365.1

MW-24-1

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-11
File ID: 150128 0728 PO4-107
Sampled: 01/27/15 13:40
Prepared: 01/28/15 07:28
Analyzed: 01/28/15 09:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2213
Sequence: 1501472
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.016	1	J U	EPA-365.1

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

EB-2-01/27/15

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-02
File ID: F020715.seq-12.0000.txt
Sampled: 01/27/15 07:15
Prepared: 02/07/15 01:00
Analyzed: 02/07/15 06:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0595
Sequence: 1502053
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

8/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-14-5

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-03
File ID: F020715.seq-13.0000.txt
Sampled: 01/27/15 07:40
Prepared: 02/07/15 01:00
Analyzed: 02/07/15 07:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0595
Sequence: 1502053
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.6	1	J	EPA-314.0

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-14-4

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-04
File ID: F020715.seq-16.0000.txt
Sampled: 01/27/15 08:20
Prepared: 02/07/15 01:00
Analyzed: 02/07/15 07:51
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0595
Sequence: 1502053
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.5	1		EPA-314.0

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-14-3

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-05
File ID: F020715.seq-8.0000.txt
Sampled: 01/27/15 08:55
Prepared: 02/07/15 01:00
Analyzed: 02/07/15 06:00
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0595
Sequence: 1502053
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	6.6	1		EPA-314.0

3/20/15 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-14-2

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-06
File ID: F020715.seq-17.0000.txt
Sampled: 01/27/15 09:40
Prepared: 02/07/15 01:00
Analyzed: 02/07/15 08:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0595
Sequence: 1502053
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-14-1

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-07
File ID: F020715.seq-18.0000.txt
Sampled: 01/27/15 10:15
Prepared: 02/07/15 01:00
Analyzed: 02/07/15 08:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0595
Sequence: 1502053
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-24-3

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-09
File ID: F020715.seq-19.0000.txt
Sampled: 01/27/15 12:00
Prepared: 02/07/15 01:00
Analyzed: 02/07/15 08:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0595
Sequence: 1502053
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-24-2

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-10
File ID: F020715.seq-20.0000.txt
Sampled: 01/27/15 13:00
Prepared: 02/07/15 01:00
Analyzed: 02/07/15 08:46
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0595
Sequence: 1502053
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-24-1

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-11RE1
File ID: F020715.seq-36.0000.txt
Sampled: 01/27/15 13:40
Prepared: 02/07/15 01:00
Analyzed: 02/07/15 15:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0595
Sequence: 1502053
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	100	10	D	EPA-314.0

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-2-01/27/15

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-02
File ID: 150128 0017 CR6-009
Sampled: 01/27/15 07:15
Prepared: 01/28/15 00:17
Analyzed: 01/28/15 00:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2214
Sequence: 1501457
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-14-3

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-05
File ID: 150128 0017 CR6-005
Sampled: 01/27/15 08:55
Prepared: 01/28/15 00:17
Analyzed: 01/28/15 00:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2214
Sequence: 1501457
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-14-2

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-06
File ID: 150128 0017 CR6-010
Sampled: 01/27/15 09:40
Prepared: 01/28/15 00:17
Analyzed: 01/28/15 00:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2214
Sequence: 1501457
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

3/29/15 8

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065	Reported: 2/24/2015 9:44:25AM Project: JPL- GW Monitoring Wells Project Number: 1Q15 Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-14-1

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-07
File ID: 150128 0017 CR6-011
Sampled: 01/27/15 10:15
Prepared: 01/28/15 00:17
Analyzed: 01/28/15 00:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2214
Sequence: 1501457
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-4

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-08
File ID: 150128 0017 CR6-012
Sampled: 01/27/15 11:15
Prepared: 01/28/15 00:17
Analyzed: 01/28/15 00:17
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2214
Sequence: 1501457
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-3

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-09
File ID: 150128 0017 CR6-015
Sampled: 01/27/15 12:00
Prepared: 01/28/15 00:17
Analyzed: 01/28/15 00:21
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2214
Sequence: 1501457
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

2/27/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-2

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-10
File ID: 150128 0017 CR6-016
Sampled: 01/27/15 13:00
Prepared: 01/28/15 00:17
Analyzed: 01/28/15 00:21
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2214
Sequence: 1501457
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0013	1	J	EPA-7196

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/24/2015 9:44:25AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-24-1

Laboratory: BC Laboratories
SDG: 15-02061
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502061-11
File ID: 150128 0017 CR6-017
Sampled: 01/27/15 13:40
Prepared: 01/28/15 00:17
Analyzed: 01/28/15 00:21
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2214
Sequence: 1501457
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

2/20/15

LDC #: 33812B6

SDG #: 15-02061

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/16/15

Page: 1 of 1

Reviewer: JD

2nd Reviewer: al

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Hexavalent Chromium (EPA SW846 Method 7196), Nitrite-N (EPA Method 353.2), Orthophosphate (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	1/27/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	ND	EB = (1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D = (11,12) (14,15)
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-2-01/27/15	314	7196	1502061-02	Water	01/27/15
2	MW-14-5			1502061-03	Water	01/27/15
3	MW-14-4			1502061-04	Water	01/27/15
4	MW-14-3		7196	1502061-05	Water	01/27/15
5	MW-14-2			1502061-06	Water	01/27/15
6	MW-14-1			1502061-07	Water	01/27/15
7	MW-24-4			1502061-08	Water	01/27/15
8	MW-24-3	314		1502061-09	Water	01/27/15
9	MW-24-2**			1502061-10**	Water	01/27/15
10	MW-24-1	314, 7196	365.1 300.0	1502061-11	Water	01/27/15
11	MW-14-3MS	7196	314	1502061-05MS	Water	01/27/15
12	MW-14-3MSD			1502061-05MSD	Water	01/27/15
13	MW-14-3DUP			1502061-05DUP	Water	01/27/15
14	MW-24-1MS		365.1	1502061-11MS	Water	01/27/15
15	MW-24-1MSD			1502061-11MSD	Water	01/27/15
16	MW-24-1DUP			1502061-11DUP	Water	01/27/15

Recalc = rounded = not enough sigfigs reported

LDC #: 35812BU

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Parameter
1, 4-6, 8-9	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
2-3	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
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
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
QC: 14-16	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 #: 35812860

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: a

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 #: 358286

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: a

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 #: 33812B6

VALIDATION FINDINGS WORKSHEET
Blanks

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

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 10

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		10									
Ortho-phosphate-P	0.0072410	0.0099400	0.0497	0.016									

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 #: 33812B6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 1/14/15

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	*0.999940*	0.999939	Y
		s2	0.002	0.0025			
		s3	0.005	0.004942			
		s4	0.025	0.024695			
		s5	0.05	0.049732			
		s6	0.1	0.100203			
ICV Calibration verification	Cr^{+6}	Found 0.0486 mg/L	True 0.05 mg/L		97%R	n/R	n/a
CCV 00:23 Calibration verification	Cr^{+6}	0.0513 mg/L	0.05 mg/L		103%R	103%R	Y
ICV 4:37 Calibration verification	ClO_4	11 ug/L	10 ug/L		110%R	109%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 #: 35812B6

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 5:47	Laboratory control sample	ClO4	11 ug/L	10 ug/L	111 %R	109 %R	y*
MS	Matrix spike sample	Cr+6	(SSR-SR) 0.055 mg/L	0.052632 mg/L	104 %R	104 %R	y
DUP 6:14	Duplicate sample	ClO4	0.7 ug/L	0.7 ug/L	0 %RPD	1 %RPD	y*

Comments: * Rounding

TOTCLC.6

LDC #: 33812B6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 (9) ClO_4 reported with a positive detect were recalculated and verified using the following equation:

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

Recalculation: $\frac{0.010}{0.000}(10) = 100$ ug/L

A = 0.010
m = 0.000 D:1=10x

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	9	ClO_4	100	100	Y
		Cr^{+6}	0.003mg/L	0.0014	Y*

Note: *Rounding

RECALC.6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 19, 2015

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02185

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-3-01/28/15	1502185-01	Water	01/28/15
EB-3-01/28/15	1502185-02	Water	01/28/15
MW-17-4	1502185-03	Water	01/28/15
MW-17-3	1502185-04	Water	01/28/15
MW-17-2**	1502185-05**	Water	01/28/15
MW-18-5	1502185-06	Water	01/28/15
MW-18-4**	1502185-07**	Water	01/28/15
MW-18-3	1502185-08	Water	01/28/15
MW-18-2	1502185-09	Water	01/28/15
MW-18-3MS	1502185-08MS	Water	01/28/15
MW-18-3MSD	1502185-08MSD	Water	01/28/15

**Indicates sample underwent EPA 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 with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
01/22/15	Pentachloroethane	33.1	All samples in SDG 15-02185	UJ (all non-detects)	P

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% with the following exceptions:

Date	Standard ID	Compound	%D	Associated Samples	Flag	A or P
01/30/15	29JAN51	Bromomethane	51.2	MW-18-5 MW-18-4** MW-18-3 MW-18-2	UJ (all non-detects)	P

Date	Standard ID	Compound	%D	Associated Samples	Flag	A or P
01/30/15	29JAN52	Methyl Iodide Pentachloroethane	52.1 96.8	MW-18-5 MW-18-4** MW-18-3 MW-18-2	UJ (all non-detects) UJ (all non-detects)	P
1/30/15	30JAN02	Bromomethane	48.1	TB-3-01/28/15 EB-3-01/28/15 MW-17-4 MW-17-3 MW-17-2**	UJ (all non-detects)	P
1/30/15	30JAN03	Methyl Iodide	62.2	TB-3-01/28/15 EB-3-01/28/15 MW-17-4 MW-17-3 MW-17-2**	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-3-01/28/15 was identified as a trip blank. No contaminants were found.

Sample EB-3-01/28/15 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 ICV %D and 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, 1Q2015
Volatiles - Data Qualification Summary - SDG 15-02185

Sample	Compound	Flag	A or P	Reason
TB-3-01/28/15 EB-3-01/28/15 MW-17-4 MW-17-3 MW-17-2** MW-18-5 MW-18-4** MW-18-3 MW-18-2	Pentachloroethane	UJ (all non-detects)	P	Initial calibration verification (%D)
MW-18-5 MW-18-4** MW-18-3 MW-18-2	Bromomethane Methyl Iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)
TB-3-01/28/15 EB-3-01/28/15 MW-17-4 MW-17-3 MW-17-2**	Bromomethane Methyl Iodide	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 1Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-02185

No Sample Data Qualified in this SDG

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-3-01/28/15

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-01	File ID:	30JAN06.D
Sampled:	01/28/15 06:30	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 14:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-3-01/28/15

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-01	File ID:	30JAN06.D
Sampled:	01/28/15 06:30	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 14:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-3-01/28/15

Laboratory:	BC Laboratories		SDG:	15-02185	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502185-01	File ID:	30JAN06.D
Sampled:	01/28/15 06:30	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 14:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	11.140	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.020	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7100	87.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	223370	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	80578	9.59	74522	9.59	
1,4-Difluorobenzene (IS)	306226	7.33	307786	7.33	

8/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-3-01/28/15

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-02	File ID:	30JAN07.D
Sampled:	01/28/15 07:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 14:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-3-01/28/15

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-02	File ID:	30JAN07.D
Sampled:	01/28/15 07:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 14:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-3-01/28/15

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-02	File ID:	30JAN07.D
Sampled:	01/28/15 07:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 14:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	10.970	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.080	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.5900	85.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	221738	6.52	212628	6.51	
Chlorobenzene-d5 (IS)	80386	9.59	74522	9.59	
1,4-Difluorobenzene (IS)	303369	7.33	307786	7.33	

8/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-4

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-03	File ID:	30JAN08.D
Sampled:	01/28/15 07:50	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 14:57
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	0.41	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: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-4

Laboratory:	BC Laboratories		SDG:	15-02185	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502185-03	File ID:	30JAN08.D
Sampled:	01/28/15 07:50	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 14:57
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	0.19	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

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-4

Laboratory:	BC Laboratories		SDG:	15-02185	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502185-03	File ID:	30JAN08.D
Sampled:	01/28/15 07:50	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 14:57
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	11.090	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8200	98.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7400	87.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	216316	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	79305	9.59	74522	9.59	
1,4-Difluorobenzene (IS)	305719	7.33	307786	7.33	

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-3

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-04	File ID:	30JAN09.D
Sampled:	01/28/15 08:30	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 15:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	0.26	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	0.18	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: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-3

Laboratory:	BC Laboratories		SDG:	15-02185	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502185-04	File ID:	30JAN09.D
Sampled:	01/28/15 08:30	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 15:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	0.39	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	0.46	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: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-3

Laboratory:	BC Laboratories		SDG:	15-02185	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502185-04	File ID:	30JAN09.D
Sampled:	01/28/15 08:30	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 15:19
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	10.980	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.070	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7600	87.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	210360	6.52	212628	6.51	
Chlorobenzene-d5 (IS)	77784	9.58	74522	9.59	
1,4-Difluorobenzene (IS)	288297	7.33	307786	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-2

Laboratory:	BC Laboratories		SDG:	15-02185	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502185-05	File ID:	30JAN10.D
Sampled:	01/28/15 09:05	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 15:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-2

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-05	File ID:	30JAN10.D
Sampled:	01/28/15 09:05	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 15:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-17-2

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-05	File ID:	30JAN10.D
Sampled:	01/28/15 09:05	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 15:42
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	11.070	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.000	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1300	91.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	218034	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	79291	9.59	74522	9.59	
1,4-Difluorobenzene (IS)	301851	7.33	307786	7.33	

3/20/15 X

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-5

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-06	File ID:	29JAN75.D
Sampled:	01/28/15 10:15	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 10:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501553 Calibration: 1501018 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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-5

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-06	File ID:	29JAN75.D
Sampled:	01/28/15 10:15	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 10:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501553 Calibration: 1501018 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	0.14	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

3/20/15 X

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

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-5

Laboratory:	BC Laboratories		SDG:	15-02185	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502185-06	File ID:	29JAN75.D
Sampled:	01/28/15 10:15	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 10:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501553 Calibration: 1501018 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	10.970	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.170	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1200	91.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	213980	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	73626	9.58	74947	9.59	
1,4-Difluorobenzene (IS)	294328	7.33	292698	7.33	

3/20/15 K

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-4

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-07	File ID:	29JAN74.D
Sampled:	01/28/15 11:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 10:24
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501553 Calibration: 1501018 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	1.4	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.66	
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

8/20/15

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

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-4

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-07	File ID:	29JAN74.D
Sampled:	01/28/15 11:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 10:24
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501553 Calibration: 1501018 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	0.99	
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

2/23/15

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-4

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-07	File ID:	29JAN74.D
Sampled:	01/28/15 11:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 10:24
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501553 Calibration: 1501018 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	10.590	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9800	99.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2700	92.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	212754	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	72699	9.58	74947	9.59	
1,4-Difluorobenzene (IS)	294574	7.33	292698	7.33	

3/20/15

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

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-3

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-08	File ID:	29JAN72.D
Sampled:	01/28/15 11:35	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 09:39
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501553 Calibration: 1501018 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	7.6	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.99	
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

3/25/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-3

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-08	File ID:	29JAN72.D
Sampled:	01/28/15 11:35	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 09:39
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501553 Calibration: 1501018 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	0.42	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	0.22	J
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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-3

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-08	File ID:	29JAN72.D
Sampled:	01/28/15 11:35	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 09:39
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501553 Calibration: 1501018 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	11.020	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9700	99.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8100	88.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190372	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	69772	9.59	74947	9.59	
1,4-Difluorobenzene (IS)	269473	7.33	292698	7.33	

8/22/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-2

Laboratory:	BC Laboratories			SDG:	15-02185
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502185-09	File ID:	29JAN73.D
Sampled:	01/28/15 13:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 10:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501553 Calibration: 1501018 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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-2

Laboratory:	BC Laboratories		SDG:	15-02185	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502185-09	File ID:	29JAN73.D
Sampled:	01/28/15 13:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 10:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501553	Calibration:	1501018	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

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:07:40AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-18-2

Laboratory:	BC Laboratories		SDG:	15-02185	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502185-09	File ID:	29JAN73.D
Sampled:	01/28/15 13:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 10:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501553	Calibration:	1501018	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	11.000	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6600	96.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7400	87.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	211665	6.51	204969	6.51	
Chlorobenzene-d5 (IS)	73388	9.58	74947	9.59	
1,4-Difluorobenzene (IS)	300166	7.33	292698	7.33	

3/20/15

LDC #: 33812C1

SDG #: 15-02185

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/6/15

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 / SW	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 2	TB-3-01/28/15	1502185-01	Water	01/28/15
2 2	EB-3-01/28/15	1502185-02	Water	01/28/15
3 2	MW-17-4	1502185-03	Water	01/28/15
4 2	MW-17-3	1502185-04	Water	01/28/15
5 2	MW-17-2**	1502185-05**	Water	01/28/15
6 1	MW-18-5	1502185-06	Water	01/28/15
7 1	MW-18-4**	1502185-07**	Water	01/28/15
8 1	MW-18-3	1502185-08	Water	01/28/15
9 1	MW-18-2	1502185-09	Water	01/28/15
10 1	MW-18-3MS	1502185-08MS	Water	01/28/15
11 1	MW-18-3MSD	1502185-08MSD	Water	01/28/15
12				
13				

LDC #: 33812C1 **VALIDATION COMPLETENESS WORKSHEET** Date: 3/6/15

SDG #: 15-02185 Level III/IV Page: 2 of 2

Laboratory: BC Laboratories, Inc. Reviewer: BK

2nd Reviewer: ✓

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				

Notes:

1	BYA2451 - BLK1						
2	1501642 - CCB1						

LDC #: 33812C1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer: CL

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 #: 33812C1

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	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Pentachloroethane
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Methyl iodide
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33812C1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: BR
2nd Reviewer: a

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 an initial calibration verification standard analyzed after each ICAL for each instrument?
Y N N/A Were all %D within the validation criteria of ≤30 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	1/22/15	ICV-MS-V5	PPPP	33.1	All	J1uJ1P (ND)

LDC #: 33812C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: AR
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
	~~1/22~~ 1/30/15	CCV-29JAN51	B	51.2	6-11 +	J/UJ/P(ND)
		CCV-29JAN52	QQQQ	52.1	BYA2451-BLK1	
		↓	PPPP	96.8		↓
	1/30/15	CCV-30JAN02	B	48.1	1-5 +	J/UJ/P(ND)
		CCV-30JAN03	QQQQ	62.2	1501642-CCB1	↓

LDC #: 33812C1

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	1/22/2015	1,1-Dichloroethene (IS1)	0.953157	0.953157	0.9317342	0.9317342	12.88825	12.88825
	MS-V5		Trichloroethene (IS2)	0.353078	0.353078	0.3347186	0.3347186	11.84779	11.84778
			1,1,2,2-Tetrachloethane	0.642118	0.642118	0.6044214	0.6044215	5.315305	5.315310

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 #: 33812C1

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	1/22/2015	Allyl chloride (IS1)	0.711435	0.711435	0.716758	0.716758	7.687894	7.687887
	MS-V5		Methyl methacrylate (IS	0.091910	0.091910	0.09828363	0.09828363	12.8917	12.8917
			Pentachloroethane (IS3	0.690898	0.690898	0.6701268	0.6701268	3.859368	3.859352

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#: 33812C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

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	30JAN02	1/30/2015	1,1-Dichloroethene (IS1)	0.931734	0.860070	0.860070	7.7	7.7
			Trichloroethene (IS2)	0.334719	0.3085898	0.3085898	7.8	7.8
			1,1,2,2-Tetrachloethane	0.604421	0.6119015	0.6119015	1.2	1.2
2	30JAN03	1/30/2015	Allyl chloride (IS1)	0.716758	0.797381	0.797381	11.2	11.2
			Methyl methacrylate (IS2	0.098284	0.09402150	0.09402150	4.3	4.3
			Pentachloroethane (IS3	0.670127	0.6078826	0.6078826	9.3	9.3

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#: 33812C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: BR
2nd Reviewer: Q

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	29JAN51	1/30/2015	1,1-Dichloroethene (IS1)	0.931734	0.862326	0.862326	7.4	7.4
			Trichloroethene (IS2)	0.334719	0.3200304	0.3200304	4.4	4.4
			1,1,2,2-Tetrachloethane	0.604421	0.5514826	0.5514826	8.8	8.8
2	29JAN52	1/30/2015	Allyl chloride (IS1)	0.716758	0.731144	0.731144	2.0	2.0
			Methyl methacrylate (IS2	0.098284	0.09269751	0.09269751	5.7	5.7
			Pentachloroethane (IS3	0.670127	0.0217654	0.0217654	96.8	96.8

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 #: 23812C1

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: 5

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.00	10.00	100	100	0
Bromofluorobenzene	↓	9.13	91.3	91.3	0
1,2-Dichlorobenzene-d4		11.07	111	111	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#: 33812C1 33812B1

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	
	MS	MSD	------	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
1,1-Dichloroethene	25.00	25.00	0	25.720	26.380	103%	103%	106%	106%	2.53%	2.53%
Trichloroethene	25.00	25.00	0.42	25.870	25.530	102%	102%	100%	100%	1.32%	1.32%
Benzene	25.00	25.00	0	24.870	24.790	99.5%	99.5%	99.2%	99.2%	0.322%	0.322%
Toluene	25.00	25.00	0	25.870	25.600	103%	103.5%	102%	102%	1.05%	1.05%
Chlorobenzene	25.00	25.00	0	24.940	24.690	99.8%	99.8%	98.8%	98.8%	1.01%	1.01%

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 #: 33812C1

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: BYA2451-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	–	26.560	–	102	102				
Trichloroethene			25.870		103	103				
Benzene			25.700		103	103				
Toluene			25.750		103	103				
Chlorobenzene			25.320		101	101				

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 #: 33812C1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: BR
2nd reviewer: 2

METHOD: GC/MS VOA (EPA Method 524.2)

5

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 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. 5, 5:

Conc. = $\frac{(404)(10)(\quad)}{(\cancel{218034}\ 301851)(0.3347)(19)}$

= 0.138961381 ug/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 20, 2015

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02185

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-3-01/28/15	1502185-02	Water	01/28/15
MW-17-4	1502185-03	Water	01/28/15
MW-17-3	1502185-04	Water	01/28/15
MW-17-2**	1502185-05**	Water	01/28/15
MW-18-4**	1502185-07**	Water	01/28/15
MW-18-3	1502185-08	Water	01/28/15
MW-18-2	1502185-09	Water	01/28/15
MW-18-3MS	1502185-08MS	Water	01/28/15
MW-18-3MSD	1502185-08MSD	Water	01/28/15
MW-18-3DUP	1502185-08DUP	Water	01/28/15

**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 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 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. 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(s).

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

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of ICS analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

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

VI. Field Blanks

Sample EB-3-01/28/15 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. ICP Serial Dilution

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

X. Laboratory Control Samples (LCS)

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)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

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, 1Q2015
Chromium - Data Qualification Summary - SDG 15-02185

No Sample Data Qualified in this SDG

NASA JPL, 1Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-02185

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:11:42AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-3-01/28/15

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-02
File ID: PE_EL2_150202-107
Sampled: 01/28/15 07:00
Prepared: 02/02/15 08:30
Analyzed: 02/02/15 18:54
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0032
Sequence: 1501751
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:11:42AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-17-4

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-03
File ID: PE_EL2_150202-108
Sampled: 01/28/15 07:50
Prepared: 02/02/15 08:30
Analyzed: 02/02/15 18:57
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0032
Sequence: 1501751
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:11:42AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-17-3

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-04
File ID: PE_EL2_150202-109
Sampled: 01/28/15 08:30
Prepared: 02/02/15 08:30
Analyzed: 02/02/15 19:01
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0032
Sequence: 1501751
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

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:11:42AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-17-2

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-05
File ID: PE_EL2_150202-110
Sampled: 01/28/15 09:05
Prepared: 02/02/15 08:30
Analyzed: 02/02/15 19:04
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0032
Sequence: 1501751
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:11:42AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-18-4

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-07
File ID: PE_EL2_150202-111
Sampled: 01/28/15 11:00
Prepared: 02/02/15 08:30
Analyzed: 02/02/15 19:08
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0032
Sequence: 1501751
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:11:42AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-18-3

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-08
File ID: PE_EL2_150202-089
Sampled: 01/28/15 11:35
Prepared: 02/02/15 08:30
Analyzed: 02/02/15 17:46
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0032
Sequence: 1501751
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	EPA-200.8

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:11:42AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-18-2

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-09
File ID: PE_EL2_150202-112
Sampled: 01/28/15 13:00
Prepared: 02/02/15 08:30
Analyzed: 02/02/15 19:11
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0032
Sequence: 1501751
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

6/20/15

LDC #: 33812C4a

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/13/15

SDG #: 15-02185

Page: 1 of 1

Laboratory: BC Laboratories, Inc.

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	1/28/15
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=(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)	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-3-01/28/15	1502185-02	Water	01/28/15
2	MW-17-4	1502185-03	Water	01/28/15
3	MW-17-3	1502185-04	Water	01/28/15
4	MW-17-2**	1502185-05**	Water	01/28/15
5	MW-18-4**	1502185-07**	Water	01/28/15
6	MW-18-3	1502185-08	Water	01/28/15
7	MW-18-2	1502185-09	Water	01/28/15
8	MW-18-3MS	1502185-08MS	Water	01/28/15
9	MW-18-3MSD	1502185-08MSD	Water	01/28/15
10	MW-18-3DUP	1502185-08DUP	Water	01/28/15
11				
12				
13				

Notes:

LDC #: 33812Cta

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 #: 35824G

VALIDATION FINDINGS CHECKLIST

Reviewer: SD
2nd Reviewer: OR

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 #: 33812C4q

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

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

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

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

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

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)						
ICW 11:15	ICP/MS (Initial calibration)	Cr	52.809ug/L	50ug/L	106%R	106%R	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV 18:36	ICP/MS (Continuing calibration)	Cr	41.816ug/L	40ug/L	105%R	105%R	Y
	CVAA (Continuing calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments: _____

CALCLC.4SW

LDC #: 33826 4c

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: SD
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 17:40	Laboratory control sample	Cr	43.794 ug/L	40 ug/L	109%R	109%R	Y
MS 18:20	Matrix spike	↓	(SSR-SR) 43.03 ug/L	40 ug/L	108%R	108%R	↓
DUP 17:50	Duplicate	↓	1.398 ug/L	1.519 ug/L	15.7%RPD	15.7%RPD	↓
SER 17:54	ICP serial dilution	↓	ND ~~1.519 ug/L~~	~~ND~~ 1.519 ug/L	NC	NC	↓

Comments: 30

TOTCLC.4SW

LDC #: 33862C4c

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JD
2nd reviewer: G

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 ND 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)
	4	Cr	ND	ND	Y
	5	↓	ND	ND	↓

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 19, 2015

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02185

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-3-01/28/15	1502185-02	Water	01/28/15
MW-17-4	1502185-03	Water	01/28/15
MW-17-3	1502185-04	Water	01/28/15
MW-17-2**	1502185-05**	Water	01/28/15
MW-18-5	1502185-06	Water	01/28/15
MW-18-4**	1502185-07**	Water	01/28/15
MW-18-3	1502185-08	Water	01/28/15
MW-18-2	1502185-09	Water	01/28/15
MW-18-3MS	1502185-08MS	Water	01/28/15
MW-18-3MSD	1502185-08MSD	Water	01/28/15
MW-18-3DUP	1502185-08DUP	Water	01/28/15

**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 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:

Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7196
Perchlorate by Environmental Protection Agency (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 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. 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 method(s). No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample EB-3-01/28/15 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 method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XI. Overall Assessment of Data

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

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

NASA JPL, 1Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-02185

No Sample Data Qualified in this SDG

NASA JPL, 1Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-02185

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-3-01/28/15

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-02
File ID: 150128 1513 CR6-027
Sampled: 01/28/15 07:00
Prepared: 01/28/15 22:38
Analyzed: 01/28/15 22:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2359
Sequence: 1501572
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

8/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-17-4

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-03
File ID: 150128 1513 CR6-028
Sampled: 01/28/15 07:50
Prepared: 01/28/15 22:38
Analyzed: 01/28/15 22:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2359
Sequence: 1501572
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-17-3

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-04
File ID: 150128 1513 CR6-029
Sampled: 01/28/15 08:30
Prepared: 01/28/15 22:38
Analyzed: 01/28/15 22:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2359
Sequence: 1501572
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

3/20/15 δ

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-17-2

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-05
File ID: 150128 1513 CR6-030
Sampled: 01/28/15 09:05
Prepared: 01/28/15 22:38
Analyzed: 01/28/15 22:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2359
Sequence: 1501572
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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-18-4

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-07
File ID: 150128 1513 CR6-033
Sampled: 01/28/15 11:00
Prepared: 01/28/15 22:38
Analyzed: 01/28/15 22:41
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2359
Sequence: 1501572
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-18-3

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-08
File ID: 150128 1513 CR6-023
Sampled: 01/28/15 11:35
Prepared: 01/28/15 22:38
Analyzed: 01/28/15 22:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2359
Sequence: 1501572
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

2/23/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-18-2

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-09
File ID: 150128 1513 CR6-034
Sampled: 01/28/15 13:00
Prepared: 01/28/15 22:38
Analyzed: 01/28/15 22:41
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2359
Sequence: 1501572
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-3-01/28/15

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-02
File ID: F021015A.seq-13.0000.txt
Sampled: 01/28/15 07:00
Prepared: 02/10/15 23:00
Analyzed: 02/11/15 01:21
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0924
Sequence: 1502360
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-17-4

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-03
File ID: F021015A.seq-16.0000.txt
Sampled: 01/28/15 07:50
Prepared: 02/10/15 23:00
Analyzed: 02/11/15 02:03
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0924
Sequence: 1502360
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-17-3

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-04
File ID: F021015A.seq-17.0000.txt
Sampled: 01/28/15 08:30
Prepared: 02/10/15 23:00
Analyzed: 02/11/15 02:16
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0924
Sequence: 1502360
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	6.3	1		EPA-314.0

2/23/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-17-2

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-05
File ID: F021015A.seq-18.0000.txt
Sampled: 01/28/15 09:05
Prepared: 02/10/15 23:00
Analyzed: 02/11/15 02:30
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0924
Sequence: 1502360
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-5

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-06
File ID: F021015A.seq-19.0000.txt
Sampled: 01/28/15 10:15
Prepared: 02/10/15 23:00
Analyzed: 02/11/15 02:44
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0924
Sequence: 1502360
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-4

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-07
File ID: F021015A.seq-20.0000.txt
Sampled: 01/28/15 11:00
Prepared: 02/10/15 23:00
Analyzed: 02/11/15 02:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0924
Sequence: 1502360
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	14	1		EPA-314.0

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-18-3

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-08
File ID: F021015A.seq-8.0000.txt
Sampled: 01/28/15 11:35
Prepared: 02/10/15 23:00
Analyzed: 02/11/15 00:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0924
Sequence: 1502360
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	14	1		EPA-314.0

8/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:09:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-18-2

Laboratory: BC Laboratories
SDG: 15-02185
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502185-09
File ID: F021015A.seq-21.0000.txt
Sampled: 01/28/15 13:00
Prepared: 02/10/15 23:00
Analyzed: 02/11/15 03:12
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0924
Sequence: 1502360
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

2/20/15

LDC #: 33812C6

SDG #: 15-02185

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/16/15

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	1/28/15
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	JD ~~A~~ 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-3-01/28/15	1502185-02	Water	01/28/15
2	MW-17-4	1502185-03	Water	01/28/15
3	MW-17-3	1502185-04	Water	01/28/15
4	MW-17-2**	1502185-05**	Water	01/28/15
5	MW-18-5 314 only	1502185-06	Water	01/28/15
6	MW-18-4**	1502185-07**	Water	01/28/15
7	MW-18-3	1502185-08	Water	01/28/15
8	MW-18-2	1502185-09	Water	01/28/15
9	MW-18-3MS 7196 314	1502185-08MS	Water	01/28/15
10	MW-18-3MSD	1502185-08MSD	Water	01/28/15
11	MW-18-3DUP	1502185-08DUP	Water	01/28/15
12				
13				
14				
15				

Notes:

Recalc: rounded = not enough sigfigs reported

LDC #: 33826

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, 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
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
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

Comments:

LDC #: 33826

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
2nd Reviewer: 3L

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 #: 33882C0

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
2nd Reviewer: CN

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 #: 35824

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cr^{+6} was recalculated. Calibration date: 1/14/15

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	*0.999940*	0.999939	Y*
		s2	0.002	0.0025			
		s3	0.005	0.004942			
		s4	0.025	0.024695			
		s5	0.05	0.049732			
		s6	0.1	0.100203			
ICV Calibration verification	Cr^{+6}	False 0.0480 mg/L	True 0.05 mg/L		97%R	NR	n/a
CCV 22:41 Calibration verification	Cr^{+6}	0.0513 mg/L	0.05 mg/L		103%R	103%R	Y
ICV 22:49 Calibration verification	ClO_4	9.23 ug/L	10 ug/L		92.3%R	92.2%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 #: 33812C6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: JD
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	Laboratory control sample	Cr^{+6}	0.0513 mg/L	0.05 mg/L	103%R	103%R	Y
MS	Matrix spike sample	Cr^{+6}	(SSR-SR) 0.05116 mg/L	0.052632 mg/L	97.2%R	98.9%R	Y*
DUP 00:24	Duplicate sample	ClO_4	13.85 ug/L	13.85 ug/L	0%RPD	3.92%RPD	Y*

Comments: *Rounding (lab is only able to provide a limited amount of significant figures on the raw data)

TOTCLC.6

LDC #: 33812C6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JO
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 = $\frac{A}{m}$

Recalculation: $\frac{0.017}{0.0013} = 13$ ug/L

A = 0.017
m = 0.0013

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	4	ClO4	ND	ND	Y
	6	ClO4	14	13	Y*

Note: Cr^{+6} = ND

*Rounding

RECALC.6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 19, 2015

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02304

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-4-01/29/15	1502304-01	Water	01/29/15
EB-4-01/29/15	1502304-02	Water	01/29/15
MW-22-3	1502304-03	Water	01/29/15
MW-22-2	1502304-04	Water	01/29/15
MW-22-1**	1502304-05**	Water	01/29/15
MW-4-3	1502304-06	Water	01/29/15
MW-4-2	1502304-07	Water	01/29/15
MW-4-1	1502304-08	Water	01/29/15
MW-26-2	1502304-09	Water	01/29/15
MW-26-1	1502304-10	Water	01/29/15
Dup-2-1Q15	1502304-11	Water	01/29/15

**Indicates sample underwent EPA 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 with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
01/22/15	Pentachloroethane	33.1	All samples in SDG 15-02304	UJ (all non-detects)	P

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% with the following exceptions:

Date	Standard ID	Compound	%D	Associated Samples	Flag	A or P
01/30/15	30JAN02	Bromomethane	48.1	All samples in SDG 15-02304	UJ (all non-detects)	P
1/30/15	30JAN03	Methyl Iodide	62.2	All samples in SDG 15-02304	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-4-01/29/15 was identified as a trip blank. No contaminants were found.

Sample EB-4-01/29/15 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-26-1 and Dup-2-1Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-26-1	Dup-2-1Q15	
Chloroform	0.50	0.46	8
1,1-Dichloroethane	0.11U	0.11	200
Tetrachloroethene	1.3	1.4	7
Trichloroethene	0.58	0.50	15

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 ICV %D and 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, 1Q2015
Volatiles - Data Qualification Summary - SDG 15-02304

Sample	Compound	Flag	A or P	Reason
TB-4-01/29/15 EB-4-01/29/15 MW-22-3 MW-22-2 MW-22-1** MW-4-3 MW-4-2 MW-4-1 MW-26-2 MW-26-1 Dup-2-1Q15	Pentachloroethane	UJ (all non-detects)	P	Initial calibration verification (%D)
TB-4-01/29/15 EB-4-01/29/15 MW-22-3 MW-22-2 MW-22-1** MW-4-3 MW-4-2 MW-4-1 MW-26-2 MW-26-1 Dup-2-1Q15	Bromomethane Methyl Iodide	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 1Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-02304

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-4-01/29/15

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-01	File ID:	30JAN11.D
Sampled:	01/29/15 05:45	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 16:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-4-01/29/15

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-01	File ID:	30JAN11.D
Sampled:	01/29/15 05:45	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 16:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501642	Calibration:	1501018	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: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-4-01/29/15

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-01	File ID:	30JAN11.D
Sampled:	01/29/15 05:45	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 16:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501642	Calibration:	1501018	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	11.300	113	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8100	98.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1300	91.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	220036	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	80270	9.58	74522	9.59	
1,4-Difluorobenzene (IS)	314096	7.33	307786	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-4-01/29/15

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-02	File ID:	30JAN12.D
Sampled:	01/29/15 06:15	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 16:27
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-4-01/29/15

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-02	File ID:	30JAN12.D
Sampled:	01/29/15 06:15	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 16:27
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-4-01/29/15

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-02	File ID:	30JAN12.D
Sampled:	01/29/15 06:15	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 16:27
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	10.970	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.080	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2100	92.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	221429	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	79257	9.58	74522	9.59	
1,4-Difluorobenzene (IS)	307736	7.33	307786	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-3

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-03	File ID:	30JAN13.D
Sampled:	01/29/15 07:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 16:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501642	Calibration:	1501018	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 MJ
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: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-3

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-03	File ID:	30JAN13.D
Sampled:	01/29/15 07:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 16:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence:	1501642	Calibration:	1501018
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-3

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-03	File ID:	30JAN13.D
Sampled:	01/29/15 07:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 16:50
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence:	1501642	Calibration:	1501018
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 US
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	10.830	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8400	98.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9900	89.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	219772	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	81498	9.59	74522	9.59	
1,4-Difluorobenzene (IS)	305597	7.33	307786	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-2

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-04	File ID:	30JAN14.D
Sampled:	01/29/15 08:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 17:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501642	Calibration:	1501018	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	0.14	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: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-2

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-04	File ID:	30JAN14.D
Sampled:	01/29/15 08:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 17:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501642	Calibration:	1501018	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: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-2

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-04	File ID:	30JAN14.D
Sampled:	01/29/15 08:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 17:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	11.020	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6900	96.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9800	89.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	216010	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	79889	9.58	74522	9.59	
1,4-Difluorobenzene (IS)	307803	7.33	307786	7.33	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-1

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-05	File ID:	30JAN15.D
Sampled:	01/29/15 08:40	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 17:35
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501642	Calibration:	1501018	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	0.57	
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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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-1

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-05	File ID:	30JAN15.D
Sampled:	01/29/15 08:40	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 17:35
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	0.52	
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	2.8	
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

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-22-1

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-05	File ID:	30JAN15.D
Sampled:	01/29/15 08:40	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 17:35
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501642	Calibration:	1501018	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	10.920	109	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.140	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2400	92.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	217871	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	76977	9.58	74522	9.59	
1,4-Difluorobenzene (IS)	299991	7.33	307786	7.33	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-3

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-06	File ID:	30JAN16.D
Sampled:	01/29/15 09:50	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 17:58
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501642	Calibration:	1501018	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: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-3

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-06	File ID:	30JAN16.D
Sampled:	01/29/15 09:50	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 17:58
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-3

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-06	File ID:	30JAN16.D
Sampled:	01/29/15 09:50	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 17:58
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	10.600	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8900	98.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1500	91.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	220178	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	78944	9.58	74522	9.59	
1,4-Difluorobenzene (IS)	304870	7.33	307786	7.33	

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-2

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-07	File ID:	30JAN17.D
Sampled:	01/29/15 10:25	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 18:20
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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 1/15
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	0.43	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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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-2

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-07	File ID:	30JAN17.D
Sampled:	01/29/15 10:25	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 18:20
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	1.4	
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: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-2

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-07	File ID:	30JAN17.D
Sampled:	01/29/15 10:25	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 18:20
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501642	Calibration:	1501018	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	11.020	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9800	99.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1100	91.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	216293	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	78873	9.59	74522	9.59	
1,4-Difluorobenzene (IS)	303214	7.33	307786	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-1

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-08	File ID:	30JAN18.D
Sampled:	01/29/15 11:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 18:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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 UT
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: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-1

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-08	File ID:	30JAN18.D
Sampled:	01/29/15 11:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 18:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-4-1

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-08	File ID:	30JAN18.D
Sampled:	01/29/15 11:00	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 18:43
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	11.060	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9800	99.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2400	92.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	218672	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	77684	9.59	74522	9.59	
1,4-Difluorobenzene (IS)	300022	7.33	307786	7.33	

3/20/15 D

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-2

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-09	File ID:	30JAN19.D
Sampled:	01/29/15 12:35	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 19:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	1.5	
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	0.32	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

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-2

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-09	File ID:	30JAN19.D
Sampled:	01/29/15 12:35	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 19:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501642	Calibration:	1501018	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	2.0	
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	0.31	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

8/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-2

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-09	File ID:	30JAN19.D
Sampled:	01/29/15 12:35	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 19:06
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	11.170	112	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8500	98.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8100	88.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	220889	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	84156	9.59	74522	9.59	
1,4-Difluorobenzene (IS)	317860	7.33	307786	7.33	

2/20/15

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-1

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-10	File ID:	30JAN20.D
Sampled:	01/29/15 13:30	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 19:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501642	Calibration:	1501018	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	0.50	
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: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-1

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-10	File ID:	30JAN20.D
Sampled:	01/29/15 13:30	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 19:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	1.3	
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	0.58	
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

3/22/15

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-26-1

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-10	File ID:	30JAN20.D
Sampled:	01/29/15 13:30	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 19:28
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYA2451	Sequence: 1501642	Calibration:	1501018	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	11.590	116	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8200	98.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0700	90.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	216461	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	80857	9.58	74522	9.59	
1,4-Difluorobenzene (IS)	312745	7.33	307786	7.33	

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-2-1Q15

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-11	File ID:	30JAN21.D
Sampled:	01/29/15 13:45	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 19:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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 NJ
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	0.46	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	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: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-2-1Q15

Laboratory:	BC Laboratories			SDG:	15-02304
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502304-11	File ID:	30JAN21.D
Sampled:	01/29/15 13:45	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 19:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	1.4	
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	0.50	
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: 2/23/2015 10:13:24AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-2-1Q15

Laboratory:	BC Laboratories		SDG:	15-02304	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502304-11	File ID:	30JAN21.D
Sampled:	01/29/15 13:45	Prepared:	01/30/15 08:39	Analyzed:	01/30/15 19:51
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYA2451 Sequence: 1501642 Calibration: 1501018 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	11.110	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.080	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0100	90.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	217425	6.51	212628	6.51	
Chlorobenzene-d5 (IS)	79236	9.58	74522	9.59	
1,4-Difluorobenzene (IS)	304994	7.33	307786	7.33	

3/20/15

LDC #: 33812D1

SDG #: 15-02304

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/6/15

Page: 1 of 2

Reviewer: BR

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 / SW	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 = 10 + 11
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-4-01/29/15	1502304-01	Water	01/29/15
2	EB-4-01/29/15	1502304-02	Water	01/29/15
3	MW-22-3	1502304-03	Water	01/29/15
4	MW-22-2	1502304-04	Water	01/29/15
5	MW-22-1**	1502304-05**	Water	01/29/15
6	MW-4-3	1502304-06	Water	01/29/15
7	MW-4-2	1502304-07	Water	01/29/15
8	MW-4-1	1502304-08	Water	01/29/15
9	MW-26-2	1502304-09	Water	01/29/15
10	MW-26-1	1502304-10	Water	01/29/15
11	Dup-2-1Q15	1502304-11	Water	01/29/15
12				
13				

LDC #: 33812D1 **VALIDATION COMPLETENESS WORKSHEET** Date: 3/6/15

SDG #: 15-02304 Level III/IV Page: 2 of 2

Laboratory: BC Laboratories, Inc. Reviewer: BK

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				

Notes:

1	BYA2451-RLK1						
2	1501642-CCB1						

LDC #: 33812D1

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 #: 33812D1

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	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Pentachloroethane
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Methyl iodide
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33812D1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: BL
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
	10	11	
K	0.50	0.46	8
I	0.114	0.11	~~200~~ 0
AA	1.3	1.4	7
S	0.58	0.50	15

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 33812D1

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	1/22/2015	1,1-Dichloroethene (IS1)	0.953157	0.953157	0.9317342	0.9317342	12.88825	12.88825
	MS-V5		Trichloroethene (IS2)	0.353078	0.353078	0.3347186	0.3347186	11.84779	11.84778
			1,1,2,2-Tetrachloethane	0.642118	0.642118	0.6044214	0.6044215	5.315305	5.315310

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 #: 33812D1

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	1/22/2015	Allyl chloride (IS1)	0.711435	0.711435	0.716758	0.716758	7.687894	7.687887
	MS-V5		Methyl methacrylate (IS	0.091910	0.091910	0.09828363	0.09828363	12.8917	12.8917
			Pentachloroethane (IS3	0.690898	0.690898	0.6701268	0.6701268	3.859368	3.859352

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#: 33812D1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

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	30JAN02	1/30/2015	1,1-Dichloroethene (IS1)	0.931734	0.860070	0.860070	7.7	7.7
			Trichloroethene (IS2)	0.334719	0.3085898	0.3085898	7.8	7.8
			1,1,2,2-Tetrachloethane	0.604421	0.6119015	0.6119015	1.2	1.2
2	30JAN03	1/30/2015	Allyl chloride (IS1)	0.716758	0.797381	0.797381	11.2	11.2
			Methyl methacrylate (IS2	0.098284	0.09402150	0.09402150	4.3	4.3
			Pentachloroethane (IS3	0.670127	0.6078826	0.6078826	9.3	9.3

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 #: 33812D1

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: 5

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.000	10.14	101	101	0
Bromofluorobenzene	↓	9.24	92.4	92.4	0
1,2-Dichlorobenzene-d4		10.92	109	109	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 #: 33812b1

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: BYA2451-LCS

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	—	26.120	—	104	104	—		—	
Trichloroethene	↓	↓	25.870	↓	103	103				
Benzene			25.700		103	103				
Toluene			25.750		103	103				
Chlorobenzene			25.320		101	101				

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 #: 33812 91

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:

Sample I.D. 5, 5: S = 2.8

Conc. = $\frac{(28242)(10)(\quad)}{(299991)(0.3347186)(\quad)}$

= 2.812596141 ug/L

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

LDC #: 33822D1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Page: 1 of 1
Reviewer: BR
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 an initial calibration verification standard analyzed after each ICAL for each instrument?
Y N N/A Were all %D within the validation criteria of ≤30 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	1/22/15	ICV-MS-V5	PPPP	33.1	All	UJ/UJ/P (ND)

LDC #: 33812D1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: BR
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
	1/30/15	CCV - 30JAN02	B	48.1	All	J/UJ/R (ND)
		CCV - 30JAN03	QQQQ	62.2		↓

CONCAL.1S5

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 19, 2015

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02304

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-4-01/29/15	1502304-02	Water	01/29/15
MW-22-3	1502304-03	Water	01/29/15
MW-22-2	1502304-04	Water	01/29/15
MW-22-1**	1502304-05**	Water	01/29/15
MW-4-3	1502304-06	Water	01/29/15
MW-4-2	1502304-07	Water	01/29/15
MW-4-1	1502304-08	Water	01/29/15
MW-26-2	1502304-09	Water	01/29/15
MW-26-1	1502304-10	Water	01/29/15
Dup-2-1Q15	1502304-11	Water	01/29/15
EB-4-01/29/15MS	1502304-02MS	Water	01/29/15
EB-4-01/29/15MSD	1502304-02MSD	Water	01/29/15
EB-4-01/29/15DUP	1502304-02DUP	Water	01/29/15

**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 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 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. 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(s).

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
02/04/15	CCV (20:01)	Chromium	114 (90-110)	MW-22-3 MW-22-2 MW-22-1** MW-4-3 MW-4-2 MW-4-1 MW-26-2 MW-26-1 Dup-2-1Q15	J (all detects)	P

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of ICS analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

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

VI. Field Blanks

Sample EB-4-01/29/15 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. ICP Serial Dilution

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

X. Laboratory Control Samples (LCS)

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

XI. Field Duplicates

Samples MW-26-1 and Dup-2-1Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-26-1	Dup-2-1Q15	
Chromium	0.66	0.66	0

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIV. 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 %R, data were qualified as estimated in nine samples.

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

NASA JPL, 1Q2015
Chromium - Data Qualification Summary - SDG 15-02304

Sample	Analyte	Flag	A or P	Reason
MW-22-3 MW-22-2 MW-22-1** MW-4-3 MW-4-2 MW-4-1 MW-26-2 MW-26-1 Dup-2-1Q15	Chromium	J (all detects)	P	Continuing calibration (%R)

NASA JPL, 1Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-02304

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:17:18AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-4-01/29/15

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-02
File ID: PE_EL2_150204-108
Sampled: 01/29/15 06:15
Prepared: 02/04/15 08:30
Analyzed: 02/04/15 19:02
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0308
Sequence: 1501893
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:17:18AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-22-3

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-03
File ID: PE_EL2_150204-116
Sampled: 01/29/15 07:00
Prepared: 02/04/15 08:30
Analyzed: 02/04/15 19:30
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0308
Sequence: 1501893
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 J	EPA-200.8

8/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:17:18AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-22-2

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-04
File ID: PE_EL2_150204-117
Sampled: 01/29/15 08:00
Prepared: 02/04/15 08:30
Analyzed: 02/04/15 19:33
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0308
Sequence: 1501893
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 J	EPA-200.8

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:17:18AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-22-1

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-05
File ID: PE_EL2_150204-118
Sampled: 01/29/15 08:40
Prepared: 02/04/15 08:30
Analyzed: 02/04/15 19:37
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0308
Sequence: 1501893
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.88	1	J J	EPA-200.8

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:17:18AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-4-3

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-06
File ID: PE_EL2_150204-119
Sampled: 01/29/15 09:50
Prepared: 02/04/15 08:30
Analyzed: 02/04/15 19:40
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0308
Sequence: 1501893
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.84	1	J	EPA-200.8

2/23/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:17:18AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-4-2

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-07
File ID: PE_EL2_150204-120
Sampled: 01/29/15 10:25
Prepared: 02/04/15 08:30
Analyzed: 02/04/15 19:44
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0308
Sequence: 1501893
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 J	EPA-200.8

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:17:18AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-4-1

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-08
File ID: PE_EL2_150204-121
Sampled: 01/29/15 11:00
Prepared: 02/04/15 08:30
Analyzed: 02/04/15 19:47
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0308
Sequence: 1501893
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.52	1	J J	EPA-200.8

8/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:17:18AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-26-2

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-09
File ID: PE_EL2_150204-122
Sampled: 01/29/15 12:35
Prepared: 02/04/15 08:30
Analyzed: 02/04/15 19:51
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0308
Sequence: 1501893
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:17:18AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-26-1

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-10
File ID: PE_EL2_150204-123
Sampled: 01/29/15 13:30
Prepared: 02/04/15 08:30
Analyzed: 02/04/15 19:54
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0308
Sequence: 1501893
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.66	1	J	EPA-200.8

2/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:17:18AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

Dup-2-1Q15

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-11
File ID: PE_EL2_150204-124
Sampled: 01/29/15 13:45
Prepared: 02/04/15 08:30
Analyzed: 02/04/15 19:58
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0308
Sequence: 1501893
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.66	1	J	EPA-200.8

2/20/15

LDC #: 33812D4a

SDG #: 15-02304

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/13/15

Page: 1 of 1

Reviewer: SD

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	1/29/15
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=(11,12)
VIII.	Duplicate sample analysis	A	DUP
IX.	ICP Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	FD=(9,10)
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-4-01/29/15	1502304-02	Water	01/29/15
2	MW-22-3	1502304-03	Water	01/29/15
3	MW-22-2	1502304-04	Water	01/29/15
4	MW-22-1**	1502304-05**	Water	01/29/15
5	MW-4-3	1502304-06	Water	01/29/15
6	MW-4-2	1502304-07	Water	01/29/15
7	MW-4-1	1502304-08	Water	01/29/15
8	MW-26-2	1502304-09	Water	01/29/15
9	MW-26-1	1502304-10	Water	01/29/15
10	Dup-2-1Q15	1502304-11	Water	01/29/15
11	EB-4-01/29/15MS	1502304-02MS	Water	01/29/15
12	EB-4-01/29/15MSD	1502304-02MSD	Water	01/29/15
13	EB-4-01/29/15DUP	1502304-02DUP	Water	01/29/15
14				
15				

LDC #: 33812D4G

VALIDATION FINDINGS CHECKLIST

Reviewer: JD
2nd Reviewer: G

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 #: 33812D4a

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 #: 33812D4a

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
	02/04/15	CCV (20:01)	Cr	114	2-10	Jdet/P (det)

Comments:

LDC# 33812D4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JD
2nd Reviewer: [illegible]

Inorganics: Method See Cover

Analyte	Concentration (ug/L)		RPD
	9	10	
Chromium	0.66	0.66	0

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33812D4a.wpd

LDC #: 33812D4c

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: JD
2nd Reviewer: C

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 12:06	ICP/MS (Initial calibration)	Cr	51.76ug/L	50ug/L	104%R	104%R	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV 20:01	ICP/MS (Continuing calibration)	Cr	45.48ug/L	40ug/L	114%R	114%R	Y
	CVAA (Contining calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments:

LDC #: 33812D4c

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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 18:55	Laboratory control sample	Cr	44.724 ug/L	40 ug/L	112%R	112%R	Y
MS 19:13	Matrix spike	Cr	(SSR-SR) 42.8 ug/L	40 ug/L	107%R	107%R	Y
MSD 19:16	Duplicate	Cr	45.54 ug/L	42.8 ug/L	6.20%RPD	6.19%RPD	Y*
SER	ICP serial dilution	Cr	ND	ND	NC	n/a	n/a

Comments: *Rounding

TOTCLC.4SW

LDC #: 33825A4a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JSD
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 (4) Cr were recalculated and verified using the following equation:

Concentration = (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 = 0.885 ug/L ≈ 0.89 ug/L

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	4	Cr^{+6}	0.88	0.89	y*

Note: *Rounding

RECALC.4SW

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 19, 2015

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02304

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-4-01/29/15	1502304-02	Water	01/29/15
MW-22-3	1502304-03	Water	01/29/15
MW-22-2	1502304-04	Water	01/29/15
MW-22-1**	1502304-05**	Water	01/29/15
MW-4-3	1502304-06	Water	01/29/15
MW-4-2	1502304-07	Water	01/29/15
MW-4-1	1502304-08	Water	01/29/15
MW-26-2	1502304-09	Water	01/29/15
MW-26-1	1502304-10	Water	01/29/15
Dup-2-1Q15	1502304-11	Water	01/29/15
EB-4-01/29/15MS	1502304-02MS	Water	01/29/15
EB-4-01/29/15MSD	1502304-02MSD	Water	01/29/15
EB-4-01/29/15DUP	1502304-02DUP	Water	01/29/15
Dup-2-1Q15DUP	1502304-11DUP	Water	01/29/15
Dup-2-1Q15MS	1502304-11MS	Water	01/29/15
Dup-2-1Q15MSD	1502304-11MSD	Water	01/29/15

**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 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:

Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7196
Perchlorate by Environmental Protection Agency (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 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. 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 method(s). No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample EB-4-01/29/15 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 method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples MW-26-1 and Dup-2-1Q15 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-26-1	Dup-2-1Q15	
Perchlorate	2.9	3.2	10

X. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XI. Overall Assessment of Data

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

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

NASA JPL, 1Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-02304

No Sample Data Qualified in this SDG

NASA JPL, 1Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-02304

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-4-01/29/15

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-02
File ID: F021215.seq-9.0000.txt
Sampled: 01/29/15 06:15
Prepared: 02/12/15 01:00
Analyzed: 02/12/15 02:37
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1071
Sequence: 1502425
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-22-3

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-03
File ID: F021215.seq-13.0000.txt
Sampled: 01/29/15 07:00
Prepared: 02/12/15 01:00
Analyzed: 02/12/15 03:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1071
Sequence: 1502425
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.8	1	J	EPA-314.0

2/20/15 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-22-2

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-04
File ID: F021215.seq-16.0000.txt
Sampled: 01/29/15 08:00
Prepared: 02/12/15 01:00
Analyzed: 02/12/15 04:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1071
Sequence: 1502425
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.9	1	J	EPA-314.0

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-22-1

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-05
File ID: F021215.seq-17.0000.txt
Sampled: 01/29/15 08:40
Prepared: 02/12/15 01:00
Analyzed: 02/12/15 04:28
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1071
Sequence: 1502425
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.9	1	J	EPA-314.0

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-4-3

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-06
File ID: F021215.seq-18.0000.txt
Sampled: 01/29/15 09:50
Prepared: 02/12/15 01:00
Analyzed: 02/12/15 04:41
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1071
Sequence: 1502425
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-4-2

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-07
File ID: F021215.seq-19.0000.txt
Sampled: 01/29/15 10:25
Prepared: 02/12/15 01:00
Analyzed: 02/12/15 04:55
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1071
Sequence: 1502425
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	5.9	1		EPA-314.0

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-4-1

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-08
File ID: F021215.seq-20.0000.txt
Sampled: 01/29/15 11:00
Prepared: 02/12/15 01:00
Analyzed: 02/12/15 05:09
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1071
Sequence: 1502425
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-26-2

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-09
File ID: F021215.seq-21.0000.txt
Sampled: 01/29/15 12:35
Prepared: 02/12/15 01:00
Analyzed: 02/12/15 05:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1071
Sequence: 1502425
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.3	1	J	EPA-314.0

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-26-1

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-10
File ID: F021215.seq-22.0000.txt
Sampled: 01/29/15 13:30
Prepared: 02/12/15 01:00
Analyzed: 02/12/15 05:37
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1071
Sequence: 1502425
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.9	1	J	EPA-314.0

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

Dup-2-1Q15

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-11
File ID: F021215.seq-25.0000.txt
Sampled: 01/29/15 13:45
Prepared: 02/12/15 01:00
Analyzed: 02/12/15 06:18
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1072
Sequence: 1502425
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

8/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-4-01/29/15

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-02
File ID: 150129 1833 CR6-056
Sampled: 01/29/15 06:15
Prepared: 01/29/15 19:50
Analyzed: 01/29/15 19:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2466
Sequence: 1501772
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-22-3

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-03
File ID: 150129 1833 CR6-077
Sampled: 01/29/15 07:00
Prepared: 01/29/15 19:50
Analyzed: 01/29/15 20:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2466
Sequence: 1501772
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0015	1	J	EPA-7196

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-7196

MW-22-2

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-04
File ID: 150129 1833 CR6-061
Sampled: 01/29/15 08:00
Prepared: 01/29/15 19:50
Analyzed: 01/29/15 19:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2466
Sequence: 1501772
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0013	1	J	EPA-7196

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-22-1

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-05
File ID: 150129 1833 CR6-062
Sampled: 01/29/15 08:40
Prepared: 01/29/15 19:50
Analyzed: 01/29/15 19:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2466
Sequence: 1501772
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-4-3

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-06
File ID: 150129 1833 CR6-063
Sampled: 01/29/15 09:50
Prepared: 01/29/15 19:50
Analyzed: 01/29/15 19:58
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2466
Sequence: 1501772
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-4-2

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-07
File ID: 150129 1833 CR6-066
Sampled: 01/29/15 10:25
Prepared: 01/29/15 19:50
Analyzed: 01/29/15 20:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2466
Sequence: 1501772
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

2/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-4-1

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-08
File ID: 150129 1833 CR6-067
Sampled: 01/29/15 11:00
Prepared: 01/29/15 19:50
Analyzed: 01/29/15 20:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2466
Sequence: 1501772
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

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-26-2

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-09
File ID: 150129 1833 CR6-068
Sampled: 01/29/15 12:35
Prepared: 01/29/15 19:50
Analyzed: 01/29/15 20:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2466
Sequence: 1501772
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

3/20/15 r

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-26-1

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-10
File ID: 150129 1833 CR6-069
Sampled: 01/29/15 13:30
Prepared: 01/29/15 19:50
Analyzed: 01/29/15 20:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2466
Sequence: 1501772
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

2/20/15 U

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 2/23/2015 10:15:26AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

Dup-2-1Q15

Laboratory: BC Laboratories
SDG: 15-02304
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502304-11
File ID: 150129 1833 CR6-070
Sampled: 01/29/15 13:45
Prepared: 01/29/15 19:50
Analyzed: 01/29/15 20:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYA2466
Sequence: 1501772
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

3/20/15

LDC #: 33812D6 **VALIDATION COMPLETENESS WORKSHEET** Date: 3/13/15

SDG #: 15-02304 Level III/IV Page: 1 of 1

Laboratory: BC Laboratories, Inc. Reviewer: JD

2nd Reviewer: A

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	1/29/15
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	MSD = (11,12) (15,16)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	FD = (9,10)
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-4-01/29/15	1502304-02	Water	01/29/15
2	MW-22-3	1502304-03	Water	01/29/15
3	MW-22-2	1502304-04	Water	01/29/15
4	MW-22-1**	1502304-05**	Water	01/29/15
5	MW-4-3	1502304-06	Water	01/29/15
6	MW-4-2	1502304-07	Water	01/29/15
7	MW-4-1	1502304-08	Water	01/29/15
8	MW-26-2	1502304-09	Water	01/29/15
9	MW-26-1	1502304-10	Water	01/29/15
10	Dup-2-1Q15	1502304-11	Water	01/29/15
11	EB-4-01/29/15MS Cr^{+6} ClO_4	1502304-02MS	Water	01/29/15
12	EB-4-01/29/15MSD	1502304-02MSD	Water	01/29/15
13	EB-4-01/29/15DUP	1502304-02DUP	Water	01/29/15
14	#10 DUP			
15	#10 MS+ SD			
16	#10 MSD			

Notes: Recalc = all rounded (not enough sigfigs reported)

LDC #: 33812DQ

VALIDATION FINDINGS CHECKLIST

Reviewer: JD
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 #: 33812b

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 #: 33812D4

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: 02

All circled methods are applicable to each sample.

Sample ID	Parameter
1-10	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
QC:14-16	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# 33812D6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: SD
2nd Reviewer: [illegible]

Inorganics: Method See Cover

Analyte	Concentration (ug/L)		RPD
	9	10	
Perchlorate	2.9	3.2	10

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33812D6.wpd

LDC #: 33812D6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of ClO_4 was recalculated. Calibration date: 2/9/15

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	0.999617	0.998571	y*
		s2	2	0.0025			
		s3	4	0.0057			
		s4	6	0.0078			
		s5	10	0.0127			
		s6	20	0.0253			
ICV 1:00 Calibration verification	ClO_4	Found 9.23ug/L	True 10ug/L		92.3%R	90.6%R	y*
ICV Calibration verification	Cr^{+6}	0.045mg/L	0.05mg/L		98%R	NR	n/a
(7) CCV 19:58 Calibration verification	Cr^{+6}	0.049mg/L	0.05mg/L		98%R	94%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 #: 33812D6

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	Laboratory control sample	Cr^{+6}	0.0513 mg/L	0.05 mg/L	103 %R	101 %R	y*
MS	Matrix spike sample	ClO_4	(SSR-SR) 10 ug/L	10.101 ug/L	99 %R	96 %R JD ~~104 %R~~	y*
MSD	Duplicate sample	ClO_4	9.23 ug/L	10 ug/L	8 %RPD	0.672 %RPD	y*

Comments: * Rounding

TOTCLC.6

LDC #: 338206

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JSD
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 (4) ClO4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = A/m

Recalculation: $\frac{0.004}{0.0013} \approx 3.1$ ug/L

A = 0.004
m = 0.0013

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	4	ClO4	2.9	3.1	Y*

Note: *Rounding

Cr+6 = ND

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

March 24, 2015

SUBJECT: NASA JPL, 1Q2015, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on March 3, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33815:

SDG #	Fraction
15-02373, 15-02486	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 #33815 (Tidewater- Powell, OH / NASA JPL, 1Q2015)

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)		Cr(VI) (7196)		O-PO_4 (365.1)		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	15-02373	03/03/15	03/24/15	16	0	15	0	1	0	1	0	15	0	1	0	15	0																				
A	15-02373	03/03/15	03/24/15	1	0	0	0	0	0	0	0	0	0	0	0	1	0																				
B	15-02486	03/03/15	03/24/15	6	0	4	0	4	0	4	0	3	0	4	0	5	0																				
Total	T/PG			23	0	19	0	5	0	5	0	18	0	5	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	96

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\33815ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 24, 2015

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02373

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-5-01/30/15	1502373-01	Water	01/30/15
SB-2-01/30/15	1502373-02	Water	01/30/15
EB-5-01/30/15	1502373-03	Water	01/30/15
MW-23-3	1502373-05	Water	01/30/15
MW-23-2	1502373-06	Water	01/30/15
Dup-3-1Q15	1502373-07	Water	01/30/15
MW-23-1	1502373-08	Water	01/30/15
MW-6	1502373-09	Water	01/30/15
Dup-4-1Q15	1502373-10	Water	01/30/15
MW-12-5**	1502373-11**	Water	01/30/15
MW-12-4	1502373-12	Water	01/30/15
MW-12-3	1502373-13	Water	01/30/15
MW-5	1502373-14	Water	01/30/15
MW-12-2	1502373-15	Water	01/30/15
MW-12-1	1502373-18	Water	01/30/15
MW-16	1502373-19	Water	01/30/15
Dup-6-1Q15	1502373-20	Water	01/30/15
MW-5MS	1502373-14MS	Water	01/30/15
MW-5MSD	1502373-14MSD	Water	01/30/15

**Indicates sample underwent EPA 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 with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
01/22/15	Pentachloroethane	33.1	All samples in SDG 15-02373	UJ (all non-detects)	P

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% with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
02/03/15	Bromomethane Methyl iodide	56.7 60.6	All samples in SDG 15-02373	UJ (all non-detects) UJ (all non-detects)	A

V. Laboratory Blanks

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

VI. Field Blanks

Sample TB-5-01/30/15 was identified as a trip blank. No contaminants were found.

Sample EB-5-01/30/15 was identified as an equipment blank. No contaminants were found.

Sample SB-2-01/30/15 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

Samples MW-23-2 and Dup-3-1Q15, samples MW-6 and Dup-4-1Q15, and samples MW-16 and Dup-6-1Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-23-2	Dup-3-1Q15	
Chloroform	0.50	0.47	6
1,1-Dichloroethane	0.17	0.18	6
Tetrachloroethene	0.38	0.34	11
Trichloroethene	1.4	1.4	0

Compound	Concentration (ug/L)		RPD
	MW-6	Dup-4-1Q15	
Chloroform	0.76	0.83	9
1,1-Dichloroethane	0.22	0.26	17
cis-1,2-Dichloroethene	0.13	0.15	14
trans-1,2-Dichloroethene	0.27	0.26	4
Tetrachloroethene	1.1	0.99	11
Trichloroethene	4.4	4.2	5

Compound	Concentration (ug/L)		RPD
	MW-16	Dup-6-1Q15	
Bromodichloromethane	2.5	2.8	11
Bromoform	0.67	0.67	0
Carbon tetrachloride	0.94	0.96	2
Chloroform	3.0	3.1	3
Dibromochloromethane	1.6	1.6	0
Tetrachloroethene	0.25	0.23	8

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 ICV and continuing calibration %D, data were qualified as estimated in seventeen 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, 1Q2015
Volatiles - Data Qualification Summary - SDG 15-02373

Sample	Compound	Flag	A or P	Reason
TB-5-01/30/15 SB-2-01/30/15 EB-5-01/30/15 MW-23-3 MW-23-2 Dup-3-1Q15 MW-23-1 MW-6 Dup-4-1Q15 MW-12-5** MW-12-4 MW-12-3 MW-5 MW-12-2 MW-12-1 MW-16 Dup-6-1Q15	Pentachloroethane	UJ (all non-detects)	P	Initial calibration verification (%D)
TB-5-01/30/15 SB-2-01/30/15 EB-5-01/30/15 MW-23-3 MW-23-2 Dup-3-1Q15 MW-23-1 MW-6 Dup-4-1Q15 MW-12-5** MW-12-4 MW-12-3 MW-5 MW-12-2 MW-12-1 MW-16 Dup-6-1Q15	Bromomethane Methyl iodide	UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D)

NASA JPL, 1Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-02373

No Sample Data Qualified in this SDG

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-5-01/30/15

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-01	File ID:	03FEB14.D
Sampled:	01/30/15 06:30	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 14:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018
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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-5-01/30/15

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-01	File ID:	03FEB14.D
Sampled:	01/30/15 06:30	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 14:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018
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

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-5-01/30/15

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-01	File ID:	03FEB14.D
Sampled:	01/30/15 06:30	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 14:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	11.760	118	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6300	96.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.3400	83.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	235723	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	90813	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	333955	7.33	326197	7.33	

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-2-01/30/15

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-02	File ID:	03FEB15.D
Sampled:	01/30/15 06:50	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 15:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-2-01/30/15

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-02	File ID:	03FEB15.D
Sampled:	01/30/15 06:50	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 15:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

SB-2-01/30/15

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-02	File ID:	03FEB15.D
Sampled:	01/30/15 06:50	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 15:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0159 Sequence: 1501781 Calibration: 1501018 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	11.570	116	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9200	99.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9800	89.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	237238	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	84150	9.59	82023	9.58	
1,4-Difluorobenzene (IS)	329545	7.33	326197	7.33	

8/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-5-01/30/15

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-03	File ID:	03FEB16.D
Sampled:	01/30/15 07:00	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 15:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018	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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-5-01/30/15

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-03	File ID:	03FEB16.D
Sampled:	01/30/15 07:00	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 15:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018
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

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-5-01/30/15

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-03	File ID:	03FEB16.D
Sampled:	01/30/15 07:00	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 15:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	11.360	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9300	99.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8200	88.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	235811	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	84023	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	328685	7.33	326197	7.33	

3/4/15 Q

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-3

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-05	File ID:	03FEB17.D
Sampled:	01/30/15 08:20	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 16:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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

3/4/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-3

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-05	File ID:	03FEB17.D
Sampled:	01/30/15 08:20	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 16:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018
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: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-3

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1502373-05		File ID:	03FEB17.D
Sampled:	01/30/15 08:20	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 16:02
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	11.630	116	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8500	98.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.4900	84.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	234391	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	85690	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	321793	7.33	326197	7.33	

3/24/15 Q

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

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Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-2

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-06	File ID:	03FEB18.D
Sampled:	01/30/15 08:55	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 16:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	0.50	
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

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Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-2

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-06	File ID:	03FEB18.D
Sampled:	01/30/15 08:55	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 16:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0159 Sequence: 1501781 Calibration: 1501018 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	0.38	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	1.4	
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

3/24/15

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Environmental Testing Laboratory Since 1949

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Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-2

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-06	File ID:	03FEB18.D
Sampled:	01/30/15 08:55	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 16:25
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	11.670	117	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.010	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7300	87.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	226760	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	81241	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	320291	7.33	326197	7.33	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-3-1Q15

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-07	File ID:	03FEB19.D
Sampled:	01/30/15 09:10	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 16:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018	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	0.47	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	0.18	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: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-3-1Q15

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-07	File ID:	03FEB19.D
Sampled:	01/30/15 09:10	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 16:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0159 Sequence: 1501781 Calibration: 1501018 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	0.34	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	1.4	
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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-3-1Q15

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-07	File ID:	03FEB19.D
Sampled:	01/30/15 09:10	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 16:48
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018	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	11.370	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8500	98.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.4700	84.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	234786	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	84854	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	322928	7.33	326197	7.33	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-1

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-08	File ID:	03FEB20.D
Sampled:	01/30/15 09:30	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 17:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	0.65	
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	0.18	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	0.22	J
156-60-5	trans-1,2-Dichloroethene	1	0.23	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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BC Laboratories, Inc.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-1

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-08	File ID:	03FEB20.D
Sampled:	01/30/15 09:30	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 17:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0159 Sequence: 1501781 Calibration: 1501018 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	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	0.58	
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	4.2	
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

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-23-1

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-08	File ID:	03FEB20.D
Sampled:	01/30/15 09:30	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 17:10
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	11.380	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7900	97.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.4800	84.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	243845	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	88922	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	333338	7.33	326197	7.33	

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

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-09	File ID:	03FEB21.D
Sampled:	01/30/15 09:27	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 17:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	0.76	
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	0.22	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	0.13	J
156-60-5	trans-1,2-Dichloroethene	1	0.27	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

3/24/15 R

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-09	File ID:	03FEB21.D
Sampled:	01/30/15 09:27	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 17:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	1.1	
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	4.4	
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: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-6

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-09	File ID:	03FEB21.D
Sampled:	01/30/15 09:27	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 17:33
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	11.360	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6600	96.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8700	88.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	239984	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	83132	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	334782	7.33	326197	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-4-1Q15

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-10	File ID:	03FEB22.D
Sampled:	01/30/15 09:42	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 17:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018	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	0.83	
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	0.26	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	0.15	J
156-60-5	trans-1,2-Dichloroethene	1	0.26	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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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-4-1Q15

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-10	File ID:	03FEB22.D
Sampled:	01/30/15 09:42	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 17:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018	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	0.99	
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	4.2	
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

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-4-1Q15

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-10	File ID:	03FEB22.D
Sampled:	01/30/15 09:42	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 17:56
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	11.620	116	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7100	97.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.5900	85.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	235755	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	85164	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	331085	7.33	326197	7.33	

3/24/15 q

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-5

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-11	File ID:	03FEB23.D
Sampled:	01/30/15 10:35	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 18:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	0.35	J
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	0.11	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: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-5

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-11	File ID:	03FEB23.D
Sampled:	01/30/15 10:35	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 18:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-5

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-11	File ID:	03FEB23.D
Sampled:	01/30/15 10:35	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 18:18
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0159 Sequence: 1501781 Calibration: 1501018 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	11.330	113	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8500	98.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8200	88.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	227229	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	81616	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	320979	7.33	326197	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-4

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-12	File ID:	03FEB24.D
Sampled:	01/30/15 11:15	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 18:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018	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	0.60	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.75	
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: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-4

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-12	File ID:	03FEB24.D
Sampled:	01/30/15 11:15	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 18:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-4

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-12	File ID:	03FEB24.D
Sampled:	01/30/15 11:15	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 18:41
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	11.430	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6900	96.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6000	86.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	210571	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	77099	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	293853	7.33	326197	7.33	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-3

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-13	File ID:	03FEB25.D
Sampled:	01/30/15 11:50	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 19:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0159 Sequence: 1501781 Calibration: 1501018 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	0.76	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	3.7	
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.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-3

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-13	File ID:	03FEB25.D
Sampled:	01/30/15 11:50	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 19:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0159 Sequence: 1501781 Calibration: 1501018 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	0.35	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: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-3

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-13	File ID:	03FEB25.D
Sampled:	01/30/15 11:50	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 19:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	11.690	117	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6600	96.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.3900	83.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	220933	6.52	221308	6.51	
Chlorobenzene-d5 (IS)	82036	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	319728	7.33	326197	7.33	

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Tidewater Inc.
3761 Attucks Drive
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Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-14	File ID:	03FEB08.D
Sampled:	01/30/15 11:39	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 12:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	0.12	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: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-14	File ID:	03FEB08.D
Sampled:	01/30/15 11:39	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 12:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	3.6	
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

3/24/15 K

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-5

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-14	File ID:	03FEB08.D
Sampled:	01/30/15 11:39	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 12:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0159 Sequence: 1501781 Calibration: 1501018 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	11.290	113	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9500	99.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7800	87.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	236223	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	84437	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	324817	7.33	326197	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-2

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-15	File ID:	03FEB26.D
Sampled:	01/30/15 12:30	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 19:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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 UT
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: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-2

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-15	File ID:	03FEB26.D
Sampled:	01/30/15 12:30	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 19:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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.
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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-2

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-15	File ID:	03FEB26.D
Sampled:	01/30/15 12:30	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 19:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	11.430	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9800	99.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.2700	82.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	224807	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	84640	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	316853	7.33	326197	7.33	

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-1

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-18	File ID:	03FEB27.D
Sampled:	01/30/15 13:30	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 19:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-1

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-18	File ID:	03FEB27.D
Sampled:	01/30/15 13:30	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 19:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018
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	0.31	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

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-12-1

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-18	File ID:	03FEB27.D
Sampled:	01/30/15 13:30	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 19:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018	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	11.490	115	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7600	97.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9100	89.1	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	208768	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	72901	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	295679	7.33	326197	7.33	

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-19	File ID:	03FEB28.D
Sampled:	01/30/15 13:00	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 20:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	2.5	
75-25-2	Bromoform	1	0.67	
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	0.94	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	3.0	
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	1.6	
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

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-19	File ID:	03FEB28.D
Sampled:	01/30/15 13:00	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 20:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0159 Sequence: 1501781 Calibration: 1501018 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	0.085	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

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-16

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-19	File ID:	03FEB28.D
Sampled:	01/30/15 13:00	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 20:12
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0159 Sequence: 1501781 Calibration: 1501018 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	11.530	115	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6600	96.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.5300	85.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	227990	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	84861	9.58	82023	9.58	
1,4-Difluorobenzene (IS)	327840	7.33	326197	7.33	

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-6-1Q15

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-20	File ID:	03FEB29.D
Sampled:	01/30/15 13:15	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 20:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018	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	2.8	
75-25-2	Bromoform	1	0.67	
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	0.96	
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	3.1	
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	1.6	
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

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-6-1Q15

Laboratory:	BC Laboratories			SDG:	15-02373
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502373-20	File ID:	03FEB29.D
Sampled:	01/30/15 13:15	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 20:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence:	1501781	Calibration:	1501018
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	0.23	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

3/24/15 8

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:02:10AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-6-1Q15

Laboratory:	BC Laboratories		SDG:	15-02373	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502373-20	File ID:	03FEB29.D
Sampled:	01/30/15 13:15	Prepared:	02/03/15 11:10	Analyzed:	02/03/15 20:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0159	Sequence: 1501781	Calibration:	1501018	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	11.940	119	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8100	98.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7000	87.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	225332	6.51	221308	6.51	
Chlorobenzene-d5 (IS)	83604	9.59	82023	9.58	
1,4-Difluorobenzene (IS)	322114	7.33	326197	7.33	

3/24/15 K

LDC #: 33815A1

SDG #: 15-02373

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/6/15

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, SW	RSD ≤ 20%, r^2 ICV ≤ 30%
IV.	Continuing calibration	SW	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1 SB = 2 EB = 3
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A ~~N~~	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	FD = 5 + 6, 8 + 9, 16 + 17
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-5-01/30/15		1502373-01	Water	01/30/15
2	SB-2-01/30/15		1502373-02	Water	01/30/15
3	EB-5-01/30/15		1502373-03	Water	01/30/15
4	MW-23-3		1502373-05	Water	01/30/15
5	MW-23-2	D	1502373-06	Water	01/30/15
6	Dup-3-1Q15	D	1502373-07	Water	01/30/15
7	MW-23-1		1502373-08	Water	01/30/15
8	MW-6	D	1502373-09	Water	01/30/15
9	Dup-4-1Q15	D	1502373-10	Water	01/30/15
10	MW-12-5**		1502373-11**	Water	01/30/15
11	MW-12-4		1502373-12	Water	01/30/15
12	MW-23-3		1502373-13	Water	01/30/15
13	MW-5		1502373-14	Water	01/30/15

LDC #: 33815A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 3/6/15

SDG #: 15-02373 Level III/IV Page: 2 of 2

Laboratory: BC Laboratories, Inc. Reviewer: KR

2nd Reviewer: CL

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14	MW-12-2	1502373-15	Water	01/30/15
15	MW-12-1	1502373-18	Water	01/30/15
16	MW-16 D	1502373-19	Water	01/30/15
17	Dup-6-1Q15 D	1502373-20	Water	01/30/15
18	MW-5MS	1502373-14MS	Water	01/30/15
19	MW-5MSD	1502373-14MSD	Water	01/30/15
20				
21				
22				
23				
24				

Notes:

T	BYB0159-BLK1						

LDC #: 33815A1

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 #: 33815A1

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	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Pentachloroethane
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. methyl iodide
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33815A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: BK
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 an initial calibration verification standard analyzed after each ICAL for each instrument?
Y N N/A Were all %D within the validation criteria of ≤30 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	1/22/15	ICV-MSVS	PPPP	33.1	ALL	J/UJ/P (ND)

LDC #: 33815A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: SR
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
	2/3/15	CCV-03FEB02	B	56.7	All	J/UJ/A (ND)
					↓	
	2/3/15	CCV-03FEB03	2Q2Q	60.6		J/UJ/A (ND)

CONCAL.1S5

LDC #: 33815A1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: BK
2nd reviewer: K

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	
K	0.50	0.47	6
T	0.17	0.18	6
AA	0.38	0.34	11
S	1.4	1.4	0

Compound	Concentration (µg/L)		RPD
	8	9	
K	0.76	0.83	9
T	0.22	0.26	17
QQQ	0.13	0.15	14
PPP	0.27	0.26	4
AA	1.1	0.99	11
S	4.4	4.2	5

Compound	Concentration (µg/L)		RPD
	16	17	
P	2.5	2.8	11
X	0.67	0.67	0
O	0.94	0.96	2
~~K~~ K	3.0	3.1	3
T	1.6	1.6	0
AA	0.25	0.23	8

LDC #: 33815A1

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	1/22/2015	1,1-Dichloroethene (IS1	0.953157	0.953157	0.9317342	0.9317342	12.88825	12.88825
	MS-V5		Trichloroethene (IS2)	0.353078	0.353078	0.3347186	0.3347186	11.84779	11.84778
			1,1,2,2-Tetrachloethane	0.642118	0.642118	0.6044214	0.6044215	5.315305	5.315310

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 #: 33815A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 2 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 32/80 std)	Recalculated RRF (RRF 32/80 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	1/22/2015	Allyl chloride (IS1)	0.711435	0.711435	0.716758	0.716758	7.687894	7.687887
	MS-V5		Methyl methacrylate (IS2	0.091910	0.091910	0.09828363	0.09828363	12.8917	12.8917
			Pentachloroethane (IS3	0.690898	0.690898	0.6701268	0.6701268	3.859368	3.859352

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#: 33815A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

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	03FEB02	2/3/2015	1,1-Dichloroethene (IS1)	0.931734	0.907438	0.907438	2.6	2.6
			Trichloroethene (IS2)	0.334719	0.3175292	0.3175292	5.1	5.1
			1,1,2,2-Tetrachloethane	0.604421	0.6013795	0.6013795	0.5	0.5
2	03FEB03	2/3/2015	Allyl chloride (IS1)	0.716758	0.782076	0.782076	9.1	9.1
			Methyl methacrylate (IS2	0.098284	0.08706548	0.08706548	11.4	11.4
			Pentachloroethane (IS3	0.670127	0.5960371	0.5960371	11.1	11.1

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 #: 33815A1

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: 1a

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.000	9.85	98.5	98.5	0
Bromofluorobenzene	↓	8.82	88.2	88.2	0
1,2-Dichlorobenzene-d4		11.33	113	113	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#: 33815A1

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: 18/19

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	27.520	26.090	110%	110%	104%	104%	5.33%	5.33%
Trichloroethene	25.00	25.00	3.61	27.870	27.870	97.0%	97.0%	97.0%	97.0%	0.00%	0.00%
Benzene	25.00	25.00	0	25.360	24.590	101%	101%	98.4%	98.4%	3.08%	3.08%
Toluene	25.00	25.00	0	25.440	25.240	102%	102%	101%	101%	0.789%	0.789%
Chlorobenzene	25.00	25.00	0	24.830	23.670	99.3%	99.3%	94.7%	94.7%	4.78%	4.78%

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 #: 33815A 1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: BR
2nd Reviewer: ✓

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: BYB059-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	25.000	—	25.650	—	103	103	—		—	
Trichloroethene	↓	↓	23.440	↓	93.8	93.8				
Benzene			24.090		96.4	96.4				
Toluene			23.580		94.3	94.3				
Chlorobenzene			23.400		93.6	93.6				

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 #: 33815A

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. 10, 5:

Conc. = $\frac{(1499)(10)(\quad)}{(320979)(0.33471)(\quad)}$

= 0.139522628 ug/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 23, 2015

Parameters: Chromium

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02373

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SB-2-01/30/15	1502373-02	Water	01/30/15
EB-5-01/30/15	1502373-03	Water	01/30/15
MW-23-4	1502373-04	Water	01/30/15
MW-23-3	1502373-05	Water	01/30/15
MW-23-2	1502373-06	Water	01/30/15
Dup-3-1Q15	1502373-07	Water	01/30/15
MW-23-1	1502373-08	Water	01/30/15
MW-6	1502373-09	Water	01/30/15
Dup-4-1Q15	1502373-10	Water	01/30/15
MW-12-3	1502373-13	Water	01/30/15
MW-5	1502373-14	Water	01/30/15
MW-12-2	1502373-15	Water	01/30/15
MW-15	1502373-16	Water	01/30/15
Dup-5-1Q15	1502373-17	Water	01/30/15
MW-12-1	1502373-18	Water	01/30/15
EB-5-01/30/15MS	1502373-03MS	Water	01/30/15
EB-5-01/30/15MSD	1502373-03MSD	Water	01/30/15
EB-5-01/30/15DUP	1502373-03DUP	Water	01/30/15
MW-5MS	1502373-14MS	Water	01/30/15
MW-5MSD	1502373-14MSD	Water	01/30/15
MW-5DUP	1502373-14DUP	Water	01/30/15

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-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. 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(s).

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

Date	Analyte	%R (Limits)	Associated Samples	Flag	A or P
02/05/15	Chromium	131 (70-130)	MW-5 MW-12-2 MW-15 Dup-5-1Q15 MW-12-1	J (all detects)	P

IV. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was 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	0.51100 ug/L	MW-5 MW-12-2 MW-15 Dup-5-1Q15 MW-12-1
ICB/CCB	Chromium	0.72100 ug/L	MW-5 MW-12-2 MW-15 Dup-5-1Q15 MW-12-1

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-5	Chromium	2.4 ug/L	2.4U ug/L
MW-12-2	Chromium	0.90 ug/L	0.90U ug/L
MW-15	Chromium	3.2 ug/L	3.2U ug/L
Dup-5-1Q15	Chromium	0.92 ug/L	0.92U ug/L
MW-12-1	Chromium	2.3 ug/L	2.3U ug/L

VI. Field Blanks

Sample EB-5-01/30/15 was identified as an equipment blank. No contaminants were found.

Sample SB-2-01/30/15 was identified as a source blank. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Duplicate Sample Analysis

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

IX. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

X. Laboratory Control Samples (LCS)

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

XI. Field Duplicates

Samples MW-23-2 and Dup-3-1Q15, samples MW-6 and Dup-4-1Q15, and samples MW-15 and Dup-5-1Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-23-2	Dup-3-1Q15	
Chromium	0.97	0.78	22

Analyte	Concentration (ug/L)		RPD
	MW-6	Dup-4-1Q15	
Chromium	78	73	7

Analyte	Concentration (ug/L)		RPD
	MW-15	Dup-5-1Q15	
Chromium	3.2	0.92	111

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 calibration %D, data were qualified as estimated in five samples.

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

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

NASA JPL, 1Q2015
Chromium - Data Qualification Summary - SDG 15-02373

Sample	Analyte	Flag	A or P	Reason
MW-5 MW-12-2 MW-15 Dup-5-1Q15 MW-12-1	Chromium	J (all detects)	P	Calibration (%R)

NASA JPL, 1Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-02373

Sample	Analyte	Modified Final Concentration	A or P
MW-5	Chromium	2.4U ug/L	A
MW-12-2	Chromium	0.90U ug/L	A
MW-15	Chromium	3.2U ug/L	A
Dup-5-1Q15	Chromium	0.92U ug/L	A
MW-12-1	Chromium	2.3U ug/L	A

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:10:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

SB-2-01/30/15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-02
File ID: PE_EL2_150209-126
Sampled: 01/30/15 06:50
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 19:42
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0360
Sequence: 1502120
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

3/24/15

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Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-5-01/30/15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-03
File ID: PE_EL2_150209-118
Sampled: 01/30/15 07:00
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 19:12
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0360
Sequence: 1502120
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

3/24/15

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INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-23-4

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-04
File ID: PE_EL2_150209-127
Sampled: 01/30/15 07:40
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 19:46
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0360
Sequence: 1502120
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

3/04/15

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Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-23-3

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-05
File ID: PE_EL2_150209-128
Sampled: 01/30/15 08:20
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 19:49
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0360
Sequence: 1502120
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.3	1		EPA-200.8

3/24/15

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Project Number: 1Q15
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INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-23-2

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-06
File ID: PE_EL2_150209-129
Sampled: 01/30/15 08:55
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 19:53
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0360
Sequence: 1502120
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.97	1	J	EPA-200.8

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INORGANIC ANALYSIS DATA SHEET
EPA-200.8

Dup-3-1Q15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-07
File ID: PE_EL2_150209-130
Sampled: 01/30/15 09:10
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 19:56
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0360
Sequence: 1502120
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.78	1	J	EPA-200.8

3/24/15 8

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Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-23-1

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-08
File ID: PE_EL2_150209-131
Sampled: 01/30/15 09:30
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 19:59
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0360
Sequence: 1502120
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.96	1	J	EPA-200.8

3/24/15

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Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-6

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-09
File ID: PE_EL2_150209-132
Sampled: 01/30/15 09:27
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 20:03
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0360
Sequence: 1502120
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	78	1		EPA-200.8

3/2/15

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Reported: 3/2/2015 10:10:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

Dup-4-1Q15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-10
File ID: PE_EL2_150209-133
Sampled: 01/30/15 09:42
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 20:06
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0360
Sequence: 1502120
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	73	1		EPA-200.8

3/24/15

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Reported: 3/2/2015 10:10:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-12-3

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-13
File ID: PE_EL2_150209-134
Sampled: 01/30/15 11:50
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 20:10
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0360
Sequence: 1502120
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

3/2/15

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Reported: 3/2/2015 10:10:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-5

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-14
File ID: PE_EL2_150205-157
Sampled: 01/30/15 11:39
Prepared: 02/04/15 18:15
Analyzed: 02/05/15 21:50
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0361
Sequence: 1501967
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 UJ	EPA-200.8

3/20/15

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Reported: 3/2/2015 10:10:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-12-2

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-15
File ID: PE_EL2_150205-165
Sampled: 01/30/15 12:30
Prepared: 02/04/15 18:15
Analyzed: 02/05/15 22:23
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0361
Sequence: 1501967
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.90	1	J U5	EPA-200.8

3/24/15

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

Reported: 3/2/2015 10:10:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-16
File ID: PE_EL2_150205-166
Sampled: 01/30/15 12:30
Prepared: 02/04/15 18:15
Analyzed: 02/05/15 22:26
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0361
Sequence: 1501967
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.2	1	U5	EPA-200.8

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
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Powell, OH 43065

Reported: 3/2/2015 10:10:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

Dup-5-1Q15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-17
File ID: PE_EL2_150205-167
Sampled: 01/30/15 12:45
Prepared: 02/04/15 18:15
Analyzed: 02/05/15 22:30
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0361
Sequence: 1501967
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.92	1	J U5	EPA-200.8

3/24/15

Tidewater Inc.
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Powell, OH 43065

Reported: 3/2/2015 10:10:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-12-1

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-18
File ID: PE_EL2_150205-168
Sampled: 01/30/15 13:30
Prepared: 02/04/15 18:15
Analyzed: 02/05/15 22:33
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0361
Sequence: 1501967
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 U5	EPA-200.8

3/24/15

LDC #: 33815A4a

SDG #: 15-02373

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 3/18/15

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	1/30/15
II.	ICP/MS Tune	A	
III.	Instrument Calibration	SW A	JD
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not Required
V.	Laboratory Blanks	SW	
VI.	Field Blanks	ND	SB=1 EB=2
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/D=(16,17) (19,20)
VIII.	Duplicate sample analysis	A	DUP ok by diff
IX.	ICP Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	FD=(5,6) (8,9) (13,14)
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	SB-2-01/30/15	1502373-02	Water	01/30/15
2	EB-5-01/30/15	1502373-03	Water	01/30/15
3	MW-23-4	1502373-04	Water	01/30/15
4	MW-23-3	1502373-05	Water	01/30/15
5	MW-23-2	1502373-06	Water	01/30/15
6	Dup-3-1Q15	1502373-07	Water	01/30/15
7	MW-23-1	1502373-08	Water	01/30/15
8	MW-6	1502373-09	Water	01/30/15
9	Dup-4-1Q15	1502373-10	Water	01/30/15
10	MW-~~23~~12-3 JD	1502373-13	Water	01/30/15
11	MW-5	1502373-14	Water	01/30/15
12	MW-12-2	1502373-15	Water	01/30/15
13	MW-15	1502373-16	Water	01/30/15
14	Dup-5-1Q15	1502373-17	Water	01/30/15
15	MW-12-1	1502373-18	Water	01/30/15

LDC #: 33815A4a

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 3/18/15

SDG #: 15-02373

Page: 2 of 2

Laboratory: BC Laboratories, Inc.

Reviewer: JD

2nd Reviewer: OV

METHOD: Chromium (EPA Method 200.8)

	Client ID	Lab ID	Matrix	Date
16	EB-5-01/30/15MS	1502373-03MS	Water	01/30/15
17	EB-5-01/30/15MSD	1502373-03MSD	Water	01/30/15
18	EB-5-01/30/15DUP	1502373-03DUP	Water	01/30/15
19	MW-5MS	1502373-14MS	Water	01/30/15
20	MW-5MSD	1502373-14MSD	Water	01/30/15
21	MW-5DUP	1502373-14DUP	Water	01/30/15
22				
23				
24				
25				
26				

Notes:

LDC #: 33815A4a

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: SD
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
	02/05/15	CRL (12:21)	Cr	131 (70-130)	11-15	Jdet/P (det)

Comments:

LDC #: 33815A4a

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: 11-15

					Sample Identification										
Analyte	**Maximum PB[a] (mg/Kg)**	**Maximum PB[a] (ug/l)**	**Maximum ICB/CCB[a] (ug/l)**	**Action Level**	11	12	13	14	15						
Cr		0.51100	0.72100	3.605	2.4	0.90	3.2	0.92	2.3						

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#: 33815A4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

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
	5	6	
Chromium	0.97	0.78	22

Analyte	Concentration (ug/L)		RPD
	8	9	
Chromium	78	73	7

Analyte	Concentration (ug/L)		RPD
	13	14	
Chromium	3.2	0.92	111

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 23, 2015

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02373

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SB-2-01/30/15	1502373-02	Water	01/30/15
EB-5-01/30/15	1502373-03	Water	01/30/15
MW-23-4	1502373-04	Water	01/30/15
MW-23-3	1502373-05	Water	01/30/15
MW-23-2	1502373-06	Water	01/30/15
Dup-3-1Q15	1502373-07	Water	01/30/15
MW-23-1	1502373-08	Water	01/30/15
MW-6	1502373-09	Water	01/30/15
Dup-4-1Q15	1502373-10	Water	01/30/15
MW-12-5**	1502373-11**	Water	01/30/15
MW-12-4	1502373-12	Water	01/30/15
MW-12-3	1502373-13	Water	01/30/15
MW-5	1502373-14	Water	01/30/15
MW-12-2	1502373-15	Water	01/30/15
MW-15	1502373-16	Water	01/30/15
Dup-5-1Q15	1502373-17	Water	01/30/15
MW-12-1	1502373-18	Water	01/30/15
MW-16	1502373-19	Water	01/30/15
Dup-6-1Q15	1502373-20	Water	01/30/15
SB-2-01/30/15MS	1502373-02MS	Water	01/30/15
SB-2-01/30/15MSD	1502373-02MSD	Water	01/30/15
SB-2-01/30/15DUP	1502373-02DUP	Water	01/30/15
MW-5MS	1502373-14MS	Water	01/30/15
MW-5MSD	1502373-14MSD	Water	01/30/15
MW-5DUP	1502373-14DUP	Water	01/30/15
MW-16MS	1502373-19MS	Water	01/30/15

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-16MSD	1502373-19MSD	Water	01/30/15
MW-16DUP	1502373-19DUP	Water	01/30/15

**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 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:

Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7196
Nitrite as Nitrogen by (EPA) Method 353.2
Orthophosphate as Phosphorus by (EPA) Method 365.1
Perchlorate by Environmental Protection Agency (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 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. 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 method(s). No contaminants were found in the laboratory blanks with the following exceptions:

Laboratory Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Orthophosphate as P	0.0088720 mg/L	MW-16

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.

V. Field Blanks

Sample EB-5-01/30/15 was identified as an equipment blank. No contaminants were found.

Sample SB-2-01/30/15 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 with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
MW-16MS/MSD (MW-16)	Orthophosphate as P	117 (90-110)	117 (90-110)	J (all detects)	A

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 method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples MW-23-2 and Dup-3-1Q15, samples MW-6 and Dup-4-1Q15, samples MW-15 and Dup-5-1Q15, and samples MW-16 and Dup-6-1Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-23-2	Dup-3-1Q15	
Hexavalent Chromium	0.0016 mg/L	0.0016 mg/L	0
Perchlorate	4.3 ug/L	4.4 ug/L	2

Analyte	Concentration		RPD
	MW-6	Dup-4-1Q15	
Hexavalent Chromium	0.0017 mg/L	0.0016 mg/L	6
Perchlorate	2.1 ug/L	2.8 ug/L	29

X. Sample Result Verification

All sample result verifications were acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XI. Overall Assessment of Data

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

Due to MS/MSD %R, data were qualified as estimated in one sample.

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

NASA JPL, 1Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-02373

Sample	Analyte	Flag	A or P	Reason
MW-16	Orthophosphate as P	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)

NASA JPL, 1Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-02373

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

SB-2-01/30/15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-02
File ID: F021215A.seq-8.0000.txt
Sampled: 01/30/15 06:50
Prepared: 02/12/15 21:00
Analyzed: 02/12/15 23:20
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1206
Sequence: 1502589
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

2/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

EB-5-01/30/15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-03
File ID: F021215A.seq-12.0000.txt
Sampled: 01/30/15 07:00
Prepared: 02/12/15 21:00
Analyzed: 02/13/15 00:15
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1206
Sequence: 1502589
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

3/04/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-23-3

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-05RE1
File ID: F022015.seq-26.0000.txt
Sampled: 01/30/15 08:20
Prepared: 02/20/15 17:00
Analyzed: 02/21/15 01:24
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1886
Sequence: 1502848
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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-23-2

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-06
File ID: F021215A.seq-16.0000.txt
Sampled: 01/30/15 08:55
Prepared: 02/12/15 21:00
Analyzed: 02/13/15 01:11
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1206
Sequence: 1502589
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.3	1		EPA-314.0

3/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

Dup-3-1Q15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-07
File ID: F021215A.seq-17.0000.txt
Sampled: 01/30/15 09:10
Prepared: 02/12/15 21:00
Analyzed: 02/13/15 01:25
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1206
Sequence: 1502589
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.4	1		EPA-314.0

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-23-1

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-08RE1
File ID: F022015.seq-28.0000.txt
Sampled: 01/30/15 09:30
Prepared: 02/20/15 17:00
Analyzed: 02/21/15 01:51
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1886
Sequence: 1502848
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

3/4/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-6

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-09
File ID: F021215A.seq-19.0000.txt
Sampled: 01/30/15 09:27
Prepared: 02/12/15 21:00
Analyzed: 02/13/15 01:52
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1206
Sequence: 1502589
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.1	1	J	EPA-314.0

3/5/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

Dup-4-1Q15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-10
File ID: F021215A.seq-20.0000.txt
Sampled: 01/30/15 09:42
Prepared: 02/12/15 21:00
Analyzed: 02/13/15 02:06
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1206
Sequence: 1502589
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.8	1	J	EPA-314.0

3/4/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-12-5

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-11
File ID: F021215A.seq-31.0000.txt
Sampled: 01/30/15 10:35
Prepared: 02/12/15 21:00
Analyzed: 02/13/15 04:38
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1207
Sequence: 1502589
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.1	1	J	EPA-314.0

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-12-4

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-12RE1
File ID: F022015.seq-32.0000.txt
Sampled: 01/30/15 11:15
Prepared: 02/20/15 17:00
Analyzed: 02/21/15 02:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1886
Sequence: 1502848
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.6	1	J	EPA-314.0

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-12-3

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-13
File ID: F021215A.seq-33.0000.txt
Sampled: 01/30/15 11:50
Prepared: 02/12/15 21:00
Analyzed: 02/13/15 05:06
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1207
Sequence: 1502589
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

3/24/15 QC

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-5

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-14
File ID: F021215A.seq-25.0000.txt
Sampled: 01/30/15 11:39
Prepared: 02/12/15 21:00
Analyzed: 02/13/15 03:15
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1207
Sequence: 1502589
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

3/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-12-2

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-15RE1
File ID: F022015.seq-34.0000.txt
Sampled: 01/30/15 12:30
Prepared: 02/20/15 17:00
Analyzed: 02/21/15 03:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1886
Sequence: 1502848
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.9	1	J	EPA-314.0

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-12-1

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-18
File ID: F021215A.seq-35.0000.txt
Sampled: 01/30/15 13:30
Prepared: 02/12/15 21:00
Analyzed: 02/13/15 05:34
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1207
Sequence: 1502589
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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-16

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-19
File ID: F021215A.seq-36.0000.txt
Sampled: 01/30/15 13:00
Prepared: 02/12/15 21:00
Analyzed: 02/13/15 05:48
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1207
Sequence: 1502589
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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:06:46AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

Dup-6-1Q15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-20
File ID: F021215A.seq-37.0000.txt
Sampled: 01/30/15 13:15
Prepared: 02/12/15 21:00
Analyzed: 02/13/15 06:01
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1207
Sequence: 1502589
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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

SB-2-01/30/15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-02
File ID: 150130 2223 CR6-005
Sampled: 01/30/15 06:50
Prepared: 01/30/15 22:23
Analyzed: 01/30/15 22:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0161
Sequence: 1501880
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

3/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-5-01/30/15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-03
File ID: 150130 2223 CR6-009
Sampled: 01/30/15 07:00
Prepared: 01/30/15 22:23
Analyzed: 01/30/15 22:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0161
Sequence: 1501880
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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-4

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-04
File ID: 150130 2223 CR6-036
Sampled: 01/30/15 07:40
Prepared: 01/30/15 22:23
Analyzed: 01/30/15 22:39
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0161
Sequence: 1501880
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0026	1		EPA-7196

3/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-3

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-05
File ID: 150130 2223 CR6-037
Sampled: 01/30/15 08:20
Prepared: 01/30/15 22:23
Analyzed: 01/30/15 22:39
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0161
Sequence: 1501880
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0036	1		EPA-7196

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-2

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-06
File ID: 150130 2223 CR6-012
Sampled: 01/30/15 08:55
Prepared: 01/30/15 22:23
Analyzed: 01/30/15 22:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0161
Sequence: 1501880
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0016	1	J	EPA-7196

3/20/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

Dup-3-1Q15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-07
File ID: 150130 2223 CR6-015
Sampled: 01/30/15 09:10
Prepared: 01/30/15 22:23
Analyzed: 01/30/15 22:30
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0161
Sequence: 1501880
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0016	1	J	EPA-7196

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-23-1

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-08
File ID: 150130 2223 CR6-016
Sampled: 01/30/15 09:30
Prepared: 01/30/15 22:23
Analyzed: 01/30/15 22:30
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0161
Sequence: 1501880
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0016	1	J	EPA-7196

3/04/15 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-6

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-09
File ID: 150130 2223 CR6-017
Sampled: 01/30/15 09:27
Prepared: 01/30/15 22:23
Analyzed: 01/30/15 22:30
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0161
Sequence: 1501880
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0017	1	J	EPA-7196

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

Dup-4-1Q15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-10
File ID: 150130 2223 CR6-018
Sampled: 01/30/15 09:42
Prepared: 01/30/15 22:23
Analyzed: 01/30/15 22:30
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0161
Sequence: 1501880
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0016	1	J	EPA-7196

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-12-3

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-13
File ID: 150130 2223 CR6-027
Sampled: 01/30/15 11:50
Prepared: 01/30/15 22:30
Analyzed: 01/30/15 22:37
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0162
Sequence: 1501880
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

3/30/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-5

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-14
File ID: 150130 2223 CR6-021
Sampled: 01/30/15 11:39
Prepared: 01/30/15 22:30
Analyzed: 01/30/15 22:30
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0162
Sequence: 1501880
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

3/24/15 8

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-12-2

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-15
File ID: 150130 2223 CR6-028
Sampled: 01/30/15 12:30
Prepared: 01/30/15 22:30
Analyzed: 01/30/15 22:37
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0162
Sequence: 1501880
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

3/30/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-16
File ID: 150130 2223 CR6-029
Sampled: 01/30/15 12:30
Prepared: 01/30/15 22:30
Analyzed: 01/30/15 22:37
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0162
Sequence: 1501880
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

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

Dup-5-1Q15

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-17
File ID: 150130 2223 CR6-030
Sampled: 01/30/15 12:45
Prepared: 01/30/15 22:30
Analyzed: 01/30/15 22:37
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0162
Sequence: 1501880
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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-12-1

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-18
File ID: 150130 2223 CR6-031
Sampled: 01/30/15 13:30
Prepared: 01/30/15 22:30
Analyzed: 01/30/15 22:37
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0162
Sequence: 1501880
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

3/2/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-365.1

MW-16

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-19
File ID: 150130 2332 PO4-103
Sampled: 01/30/15 13:00
Prepared: 01/30/15 23:32
Analyzed: 01/31/15 15:39
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0312
Sequence: 1501869
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.19	1	J	EPA-365.1

3/4/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-353.2

MW-16

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-19
File ID: 150130 2322 NO2-048
Sampled: 01/30/15 13:00
Prepared: 01/30/15 23:22
Analyzed: 01/30/15 23:22
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0207
Sequence: 1501870
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

3/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:05:01AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-300.0

MW-16

Laboratory: BC Laboratories
SDG: 15-02373
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502373-19
File ID: H013015A.seq-17
Sampled: 01/30/15 13:00
Prepared: 01/30/15 22:00
Analyzed: 01/31/15 02:41
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0007
Sequence: 1502024
Calibration: UNASSIGNED
Instrument: IC8

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	85	1		EPA-300.0
14797-55-8	Nitrate as N	1.2	1		EPA-300.0
14808-79-8	Sulfate	47	1		EPA-300.0

3/20/15

LDC #: 33815A6

SDG #: 15-02373

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/18/15

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), Orthophosphate (EPA Method 365.1), 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	1/30/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	ND	SB=(1) EB=(2)
VI.	Matrix Spike/Matrix Spike Duplicates	SW	MS/D=(23,24) (20,21) (26,27)
VII.	Duplicate sample analysis	A	DUP
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	FD= (5,6) (8,9) (15,16) (18,19)
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	SB-2-01/30/15	1502373-02	Water	01/30/15
2	EB-5-01/30/15	1502373-03	Water	01/30/15
3	MW-23-4 no ClO_4	1502373-04	Water	01/30/15
4	MW-23-3	1502373-05	Water	01/30/15
5	MW-23-2	1502373-06	Water	01/30/15
6	Dup-3-1Q15	1502373-07	Water	01/30/15
7	MW-23-1	1502373-08	Water	01/30/15
8	MW-6	1502373-09	Water	01/30/15
9	Dup-4-1Q15	1502373-10	Water	01/30/15
10	MW-12-5** no Cr^{+6}	1502373-11**	Water	01/30/15
11	MW-12-4 ↓	1502373-12	Water	01/30/15
12	MW-~~23~~ 12-3 3D	1502373-13	Water	01/30/15
13	MW-5	1502373-14	Water	01/30/15
14	MW-12-2	1502373-15	Water	01/30/15
15	MW-15 no ClO_4	1502373-16	Water	01/30/15
16	Dup-5-1Q15 ↓	1502373-17	Water	01/30/15

ClO_4 recalc = rounded = not enough sig figs reported

LDC #: 33815A6

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/8/15

SDG #: 15-02373

Page: 2 of 2

Laboratory: BC Laboratories, Inc.

Reviewer: 3D

2nd Reviewer: 02

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

	Client ID			Lab ID	Matrix	Date
17	MW-12-1			1502373-18	Water	01/30/15
18	MW-16	no Cr^{+6}	ORO_4-P, 300.0	1502373-19	Water	01/30/15
19	Dup-6-1Q15	↓		1502373-20	Water	01/30/15
20	SB-2-01/30/15MS	ClO_4	Cr^{+6}	1502373-02MS	Water	01/30/15
21	SB-2-01/30/15MSD	↓	↓	1502373-02MSD	Water	01/30/15
22	SB-2-01/30/15DUP	↓	Cr^{+6}	1502373-02DUP	Water	01/30/15
23	MW-5MS	ClO_4	Cr^{+6}	1502373-14MS	Water	01/30/15
24	MW-5MSD	↓	↓	1502373-14MSD	Water	01/30/15
25	MW-5DUP	↓	Cr^{+6}	1502373-14DUP	Water	01/30/15
26	MW-16MS	NO_2-N	↑	1502373-19MS	Water	01/30/15
27	MW-16MSD	↓	ORO_4	1502373-19MSD	Water	01/30/15
28	MW-16DUP	↓	↓	1502373-19DUP	Water	01/30/15
29						
30						
31						
32						
33						

Notes:

LDC #: 35815AV

VALIDATION FINDINGS CHECKLIST

Reviewer: SQ
2nd Reviewer: OR

Method: Inorganics (EPA Method See Low)

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 #: 53880SAP

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.	✓	✓		(yes) SD
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 #: 33815A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Parameter
1-2, 4-9, 12-14, 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
3, 15-16	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
10-11, 19	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
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: 20-25	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: 26-28	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 #: 33815A6

VALIDATION FINDINGS WORKSHEET
Blanks

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

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 18

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		No Qualifiers									
Orthophosphate-P		0.0088720	0.04436										

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 #: 33815A6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
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 ~~75-125?~~ If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

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

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	26/27	W	OPO4-P	117 (90-110)	117 (90-110)		18	Jdet/A (det)

Comments:

MS-MSD.wpd

LDC# 33815A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: SD

2nd Reviewer: CL

Inorganics: Method See Cover

Analyte	Concentration		RPD
	5	6	
Hexavalent Chromium	0.0016 (mg/L)	0.0016 (mg/L)	0
Perchlorate	4.3 (ug/L)	4.4 (ug/L)	2

Analyte	Concentration		RPD
	8	9	
Hexavalent Chromium	0.0017 (mg/L)	0.0016 (mg/L)	6
Perchlorate	2.1 (ug/L)	2.8 (ug/L)	29

LDC #: 33815A4

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of ClO4 was recalculated. Calibration date: 2/9/15

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	0.998418	0.998571	y*
		s2	2	0.003			
		s3	4	0.006			
		s4	6	0.008			
		s5	10	0.013			
		s6	20	0.025			
ICV 21:57 Calibration verification	ClO4	~~Found~~ 9.23 ug/L	~~True~~ 10 ug/L		92.3%R	91.4%R	
CCV 03:29 Calibration verification	ClO4	10 ug/L	10 ug/L		100%R	104%R	
Calibration verification							

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

LDC #: 33815A0

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	Laboratory control sample	ClO_4	10 ug/L	10 ug/L	100 %R	103 %R	Y*
MS	Matrix spike sample	↓	(SSR-SR) 7.82 ug/L	10.101 ug/L	77.3 %R	82.1 %R	Y*
DUP	Duplicate sample	↓	3.846 ug/L	3.846 ~~0.769~~ SD ug/L	0 % RPD	0.556 % RPD	Y*

Comments: *Rounding

TOTCLC.6

LDC #: 33815A4

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: SD
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 (10) ClO4 reported with a positive detect were recalculated and verified using the following equation:

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

A = 0.003
m = 0.0013

Recalculation: $\frac{0.003}{0.0013} = 2.3$ ug/L

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	10	ClO4	2.1	2.3	y*

Note: *Rounding

RECALC.6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 23, 2015

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02486

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-6-020215	1502486-01	Water	02/02/15
MW-13	1502486-02	Water	02/02/15
MW-8	1502486-03	Water	02/02/15
MW-10	1502486-04	Water	02/02/15
MW-7	1502486-05	Water	02/02/15
Dup-7-1Q15	1502486-06	Water	02/02/15
MW-8MS	1502486-03MS	Water	02/02/15
MW-8MSD	1502486-03MSD	Water	02/02/15

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 with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
01/22/15	Pentachloroethane	33.1	All samples in SDG 15-02486	UJ (all non-detects)	P

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% with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
02/04/15 (04FEB02)	Bromomethane	64.2	All samples in SDG 15-02486	UJ (all non-detects)	A
02/04/15 (04FEB03)	Trans-1,4-Dichloro-2-butene Methyl Iodide	32.6 59.7	All samples in SDG 15-02486	UJ (all non-detects) UJ (all non-detects)	A

V. Laboratory Blanks

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

VI. Field Blanks

Sample TB-6-020215 was identified as a trip 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-7 and Dup-7-1Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	MW-7	Dup-7-1Q15	
Bromodichloromethane	1.9	1.9	0
Bromoform	0.59	0.48	21
Chloroform	5.5	5.6	2
Dibromochloromethane	1.2	1.3	8
Tetrachloroethene	0.51	0.58	13
Trichloroethene	0.11	0.10	10

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 ICV and continuing calibration %D, 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 (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, 1Q2015
Volatiles - Data Qualification Summary - SDG 15-02486

Sample	Compound	Flag	A or P	Reason
TB-6-020215 MW-13 MW-8 MW-10 MW-7 Dup-7-1Q15	Pentachloroethane	UJ (all non-detects)	P	Initial calibration verification (%D)
TB-6-020215 MW-13 MW-8 MW-10 MW-7 Dup-7-1Q15	Bromomethane Trans-1,4-Dichloro-2-butene Methyl Iodide	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D)

NASA JPL, 1Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-02486

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-6-020215

Laboratory:	BC Laboratories			SDG:	15-02486
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502486-01	File ID:	04FEB13.D
Sampled:	02/02/15 07:45	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 14:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence:	1501845	Calibration:	1501018
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

3/04/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-6-020215

Laboratory:	BC Laboratories			SDG:	15-02486
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502486-01	File ID:	04FEB13.D
Sampled:	02/02/15 07:45	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 14:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0253 Sequence: 1501845 Calibration: 1501018 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

3/4/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-6-020215

Laboratory:	BC Laboratories		SDG:	15-02486	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502486-01	File ID:	04FEB13.D
Sampled:	02/02/15 07:45	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 14:22
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence: 1501845	Calibration:	1501018	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 UJ
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	10.950	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9400	99.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.480	105	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	264732	6.51	245684	6.51	
Chlorobenzene-d5 (IS)	92240	9.59	89460	9.58	
1,4-Difluorobenzene (IS)	354462	7.33	357795	7.33	

3/4/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-13

Laboratory:	BC Laboratories		SDG:	15-02486	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502486-02	File ID:	04FEB14.D
Sampled:	02/02/15 08:10	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 14:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence: 1501845	Calibration:	1501018	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	0.75	
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

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-13

Laboratory:	BC Laboratories			SDG:	15-02486
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502486-02	File ID:	04FEB14.D
Sampled:	02/02/15 08:10	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 14:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence:	1501845	Calibration:	1501018
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	0.12	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	1.4	
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	0.64	
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

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-13

Laboratory:	BC Laboratories		SDG:	15-02486	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502486-02	File ID:	04FEB14.D
Sampled:	02/02/15 08:10	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 14:44
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence: 1501845	Calibration:	1501018	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 UJ
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	11.770	118	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8300	98.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9200	99.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	267926	6.51	245684	6.51	
Chlorobenzene-d5 (IS)	95835	9.58	89460	9.58	
1,4-Difluorobenzene (IS)	372462	7.33	357795	7.33	

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-8

Laboratory:	BC Laboratories			SDG:	15-02486
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502486-03	File ID:	04FEB07.D
Sampled:	02/02/15 09:33	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 12:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence:	1501845	Calibration:	1501018	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	6.6	
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

3/4/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-8

Laboratory:	BC Laboratories			SDG:	15-02486
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502486-03	File ID:	04FEB07.D
Sampled:	02/02/15 09:33	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 12:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence:	1501845	Calibration:	1501018
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

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-8

Laboratory:	BC Laboratories		SDG:	15-02486	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502486-03	File ID:	04FEB07.D
Sampled:	02/02/15 09:33	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 12:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence: 1501845	Calibration:	1501018	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 UJ
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	11.930	119	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.060	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.240	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	255373	6.51	245684	6.51	
Chlorobenzene-d5 (IS)	92353	9.59	89460	9.58	
1,4-Difluorobenzene (IS)	356467	7.33	357795	7.33	

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories		SDG:	15-02486	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502486-04	File ID:	04FEB15.D
Sampled:	02/02/15 10:53	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 15:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence: 1501845	Calibration:	1501018	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	0.28	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	0.36	J
156-60-5	trans-1,2-Dichloroethene	1	0.59	
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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories			SDG:	15-02486
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502486-04	File ID:	04FEB15.D
Sampled:	02/02/15 10:53	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 15:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence:	1501845	Calibration:	1501018
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	1.0	
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	9.8	
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

3/20/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories		SDG:	15-02486	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1502486-04		File ID:	04FEB15.D
Sampled:	02/02/15 10:53	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 15:07
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence: 1501845	Calibration:	1501018	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 US
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 US
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	11.530	115	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9200	99.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.500	105	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	265192	6.51	245684	6.51	
Chlorobenzene-d5 (IS)	94023	9.58	89460	9.58	
1,4-Difluorobenzene (IS)	364634	7.33	357795	7.33	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-7

Laboratory:	BC Laboratories		SDG:	15-02486	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502486-05	File ID:	04FEB16.D
Sampled:	02/02/15 12:38	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 15:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence: 1501845	Calibration:	1501018	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	1.9	
75-25-2	Bromoform	1	0.59	
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	5.5	
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	1.2	
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

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-7

Laboratory:	BC Laboratories			SDG:	15-02486
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502486-05	File ID:	04FEB16.D
Sampled:	02/02/15 12:38	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 15:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence:	1501845	Calibration:	1501018	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	0.51	
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

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-7

Laboratory:	BC Laboratories		SDG:	15-02486	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502486-05	File ID:	04FEB16.D
Sampled:	02/02/15 12:38	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 15:30
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence: 1501845	Calibration:	1501018	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 UJ
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	11.540	115	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6900	96.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.230	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	260270	6.51	245684	6.51	
Chlorobenzene-d5 (IS)	91682	9.58	89460	9.58	
1,4-Difluorobenzene (IS)	364744	7.33	357795	7.33	

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-7-1Q15

Laboratory:	BC Laboratories		SDG:	15-02486	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502486-06	File ID:	04FEB17.D
Sampled:	02/02/15 12:53	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 15:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence: 1501845	Calibration:	1501018	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	1.9	
75-25-2	Bromoform	1	0.48	J
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	5.6	
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	1.3	
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

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-7-1Q15

Laboratory:	BC Laboratories			SDG:	15-02486
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502486-06	File ID:	04FEB17.D
Sampled:	02/02/15 12:53	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 15:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence:	1501845	Calibration:	1501018
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	0.58	
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	0.13	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: 3/2/2015 10:13:22AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

Dup-7-1Q15

Laboratory:	BC Laboratories			SDG:	15-02486
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502486-06	File ID:	04FEB17.D
Sampled:	02/02/15 12:53	Prepared:	02/04/15 07:08	Analyzed:	02/04/15 15:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0253	Sequence:	1501845	Calibration:	1501018	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 UJ
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	11.660	117	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8100	98.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9700	99.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	259285	6.51	245684	6.51	
Chlorobenzene-d5 (IS)	94267	9.58	89460	9.58	
1,4-Difluorobenzene (IS)	361820	7.33	357795	7.33	

3/20/15

LDC #: 33815B1

SDG #: 15-02486

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 3/6/15

Page: 1 of 1

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 / SW	RSD ≤ 20?, r² ICV ≤ 30?
IV.	Continuing calibration	SW	CCV ≤ 30?
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A ~~N~~	
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-6-020215	1502486-01	Water	02/02/15
2	MW-13	1502486-02	Water	02/02/15
3	MW-8	1502486-03	Water	02/02/15
4	MW-10	1502486-04	Water	02/02/15
5	MW-7	1502486-05	Water	02/02/15
6	Dup-7-1Q15	1502486-06	Water	02/02/15
7	MW-8MS	1502486-03MS	Water	02/02/15
8	MW-8MSD	1502486-03MSD	Water	02/02/15
9				
10				

Notes:

1	BYB0253-BLK1						

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Pentachloroethane
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. methyl iodide
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR. trans-1,4-Dichloro-2-butene
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33815B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: BR
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 an initial calibration verification standard analyzed after each ICAL for each instrument?
Y N N/A Were all %D within the validation criteria of ≤30 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	1/22/15	ICV-MS-V5	PPPP	33.1	All	J/UJ/P (ND)

LDC #: 338158I

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: BR
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
	2/4/15	CCV-~~[illegible]~~	B	64.2	All	J/UJ/P(ND)
		04FEB02				
	2/4/15	CCV-04FEB03	RRRR	32.6	All	J/UJ/P(ND)
			QQQQ	59.7		

CONCAL.1S5

LDC #: 3381581

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: BR
2nd reviewer:

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	
P	1.9	1.9	0
X	0.59	0.48	21
K	5.5	5.6	2
T	1.2	1.3	8
AA	0.51	0.58	13
S	0.11	0.10	10

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 23, 2015

Parameters: Chromium

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02486

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-8	1502486-03	Water	02/02/15
MW-10	1502486-04	Water	02/02/15
MW-7	1502486-05	Water	02/02/15
Dup-7-1Q15	1502486-06	Water	02/02/15
MW-8MS	1502486-03MS	Water	02/02/15
MW-8MSD	1502486-03MSD	Water	02/02/15
MW-8DUP	1502486-03DUP	Water	02/02/15

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 and cooler temperatures upon receipt met validation criteria.

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(s).

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

Date	Analyte	%R (Limits)	Associated Samples	Flag	A or P
02/05/15	Chromium	131 (70-130)	MW-10	J (all detects)	P

IV. ICP Interference Check Sample (ICS) Analysis

ICP Interference check sample analysis was 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
ICB/CCB	Chromium	0.72100 ug/L	All samples in SDG 15-02486

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.

VI. Field Blanks

No field blanks were identified in this SDG.

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. ICP Serial Dilution

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

X. Laboratory Control Samples (LCS)

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

XI. Field Duplicates

Samples MW-7 and Dup-7-1Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-7	Dup-7-1Q15	
Chromium	49	57	15

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 calibration %D, data were qualified as estimated in one sample.

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

NASA JPL, 1Q2015
Chromium - Data Qualification Summary - SDG 15-02486

Sample	Analyte	Flag	A or P	Reason
MW-10	Chromium	J (all detects)	P	Calibration (%R)

NASA JPL, 1Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-02486

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:12:17AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-8

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-03
File ID: PE_EL2_150205-186
Sampled: 02/02/15 09:33
Prepared: 02/05/15 08:30
Analyzed: 02/05/15 23:50
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0461
Sequence: 1501981
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	29	1		EPA-200.8

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:12:17AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-10

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-04
File ID: PE_EL2_150205-209
Sampled: 02/02/15 10:53
Prepared: 02/05/15 08:30
Analyzed: 02/06/15 01:10
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0461
Sequence: 1501981
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	4.7	1	J	EPA-200.8

3/24/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:12:17AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-7

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-05
File ID: PE_EL2_150205-210
Sampled: 02/02/15 12:38
Prepared: 02/05/15 08:30
Analyzed: 02/06/15 01:13
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0461
Sequence: 1501981
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	49	1		EPA-200.8

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:12:17AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

Dup-7-1Q15

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-06
File ID: PE_EL2_150205-211
Sampled: 02/02/15 12:53
Prepared: 02/05/15 08:30
Analyzed: 02/06/15 01:17
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0461
Sequence: 1501981
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	57	1		EPA-200.8

3/24/15

LDC #: 33815B4a

SDG #: 15-02486

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 3/8/15

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	02/02/15
II.	ICP/MS Tune	A	
III.	Instrument Calibration JD	~~A~~ SW	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not Required
V.	Laboratory Blanks	SW	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	A	MS/D = (5.6)
VIII.	Duplicate sample analysis	A	DUP
IX.	ICP Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	FD = (3.4)
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	MW-8	1502486-03	Water	02/02/15
2	MW-10	1502486-04	Water	02/02/15
3	MW-~~4~~ 7 JD	1502486-05	Water	02/02/15
4	Dup-7-1Q15	1502486-06	Water	02/02/15
5	MW-8MS	1502486-03MS	Water	02/02/15
6	MW-8MSD	1502486-03MSD	Water	02/02/15
7	MW-8DUP	1502486-03DUP	Water	02/02/15
8				
9				
10				
11				
12				

Notes:

LDC #: 33815B4a

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
	02/05/15	CRL (12:21)	Cr	131 (70-130)	2	Jdet/P (det)
					1, 3-4	No Qual. (>2X RL)

Comments:

LDC #: 33815B4a

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)**	**Action Level**	No Qual.										
Cr			0.72100	3.605											

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#: 33815B4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
Reviewer: SD
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
	3	4	
Chromium	49	57	15

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33815B4a.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 23, 2015

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02486

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-13	1502486-02	Water	02/02/15
MW-8	1502486-03	Water	02/02/15
MW-10	1502486-04	Water	02/02/15
MW-7	1502486-05	Water	02/02/15
Dup-7-1Q15	1502486-06	Water	02/02/15
MW-8MS	1502486-03MS	Water	02/02/15
MW-8MSD	1502486-03MSD	Water	02/02/15

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:

Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) Method 300.0
Hexavalent Chromium by Environmental Protection Agency (EPA) SW 846 Method 7196
Nitrite as Nitrogen by (EPA) Method 353.2
Orthophosphate as Phosphorus by (EPA) Method 365.1
Perchlorate by Environmental Protection Agency (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 method(s). 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. 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 method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples MW-7 and Dup-7-1Q15 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD
	MW-7	Dup-7-1Q15	
Chloride	72 mg/L	72 mg/L	0
Nitrate as N	3.1 mg/L	3.1 mg/L	0
Sulfate	46 mg/L	46 mg/L	0
Orthophosphate as P	0.024 mg/L	0.023 mg/L	4
Hexavalent Chromium	0.0038 mg/L	0.0038 mg/L	0
Perchlorate	750 ug/L	740 ug/L	1

X. Sample Result Verification

Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

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

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

NASA JPL, 1Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-02486

No Sample Data Qualified in this SDG

NASA JPL, 1Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-02486

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-8

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-03
File ID: 150202 1459 CR6-045
Sampled: 02/02/15 09:33
Prepared: 02/02/15 19:30
Analyzed: 02/02/15 19:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0167
Sequence: 1501885
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0092	1		EPA-7196

3/4/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-7

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-05
File ID: 150202 1459 CR6-049
Sampled: 02/02/15 12:38
Prepared: 02/02/15 19:30
Analyzed: 02/02/15 19:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0167
Sequence: 1501885
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0038	1		EPA-7196

3/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

Dup-7-1Q15

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-06
File ID: 150202 1459 CR6-050
Sampled: 02/02/15 12:53
Prepared: 02/02/15 19:30
Analyzed: 02/02/15 19:32
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0167
Sequence: 1501885
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0038	1		EPA-7196

3/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-365.1

MW-13

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-02
File ID: 150203 0748 PO4-009
Sampled: 02/02/15 08:10
Prepared: 02/03/15 07:48
Analyzed: 02/03/15 07:48
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0206
Sequence: 1501886
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.026	1		EPA-365.1

3/24/15 8

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-365.1

MW-8

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-03
File ID: 150203 0748 PO4-005
Sampled: 02/02/15 09:33
Prepared: 02/03/15 07:48
Analyzed: 02/03/15 07:48
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0206
Sequence: 1501886
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.011	1	J	EPA-365.1

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-365.1

MW-7

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-05
File ID: 150203 0748 PO4-010
Sampled: 02/02/15 12:38
Prepared: 02/03/15 07:48
Analyzed: 02/03/15 07:48
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0206
Sequence: 1501886
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.024	1		EPA-365.1

3/24/15

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Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-365.1

Dup-7-1Q15

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-06
File ID: 150203 0748 PO4-011
Sampled: 02/02/15 12:53
Prepared: 02/03/15 07:48
Analyzed: 02/03/15 07:48
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0206
Sequence: 1501886
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.023	1		EPA-365.1

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-13

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-02
File ID: 150203 0909 NO2-030
Sampled: 02/02/15 08:10
Prepared: 02/03/15 09:09
Analyzed: 02/03/15 09:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0204
Sequence: 1501887
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

3/20/15 a

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-8

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-03
File ID: 150203 0909 NO2-026
Sampled: 02/02/15 09:33
Prepared: 02/03/15 09:09
Analyzed: 02/03/15 09:09
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0204
Sequence: 1501887
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

3/2/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-7

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-05
File ID: 150203 0909 NO2-031
Sampled: 02/02/15 12:38
Prepared: 02/03/15 09:09
Analyzed: 02/03/15 09:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0204
Sequence: 1501887
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

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-353.2

Dup-7-1Q15

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-06
File ID: 150203 0909 NO2-032
Sampled: 02/02/15 12:53
Prepared: 02/03/15 09:09
Analyzed: 02/03/15 09:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0204
Sequence: 1501887
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

3/24/15 Q

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-13

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-02
File ID: F021415.seq-12.0000.txt
Sampled: 02/02/15 08:10
Prepared: 02/14/15 15:00
Analyzed: 02/14/15 17:59
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1378
Sequence: 1502522
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.9	1		EPA-314.0

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-8

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-03
File ID: F021415.seq-8.0000.txt
Sampled: 02/02/15 09:33
Prepared: 02/14/15 15:00
Analyzed: 02/14/15 17:03
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1378
Sequence: 1502522
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	7.0	1		EPA-314.0

3/24/15

Tidewater Inc.
3761 Attucks Drive
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Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-10

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-04
File ID: F021415.seq-13.0000.txt
Sampled: 02/02/15 10:53
Prepared: 02/14/15 15:00
Analyzed: 02/14/15 18:13
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1378
Sequence: 1502522
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.9	1	J	EPA-314.0

3/20/15

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-7

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-05RE1
File ID: F021415.seq-35.0000.txt
Sampled: 02/02/15 12:38
Prepared: 02/14/15 15:00
Analyzed: 02/16/15 17:05
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1378
Sequence: 1502522
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	750	50	D	EPA-314.0

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

Dup-7-1Q15

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-06RE1
File ID: F021415.seq-38.0000.txt
Sampled: 02/02/15 12:53
Prepared: 02/14/15 15:00
Analyzed: 02/16/15 17:46
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB1378
Sequence: 1502522
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	740	50	D	EPA-314.0

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-300.0

MW-13

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-02RE1
File ID: A020215A.seq-18
Sampled: 02/02/15 08:10
Prepared: 02/02/15 22:00
Analyzed: 02/03/15 08:53
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0142
Sequence: 1502033
Calibration: UNASSIGNED
Instrument: IC1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	130	1		EPA-300.0
14797-55-8	Nitrate as N	11	1		EPA-300.0
14808-79-8	Sulfate	170	1		EPA-300.0

3/24/15

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Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-300.0

MW-8

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-03
File ID: A020215A.seq-07
Sampled: 02/02/15 09:33
Prepared: 02/02/15 22:00
Analyzed: 02/03/15 00:16
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0142
Sequence: 1502033
Calibration: UNASSIGNED
Instrument: IC1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	84	1		EPA-300.0
14797-55-8	Nitrate as N	1.3	1		EPA-300.0
14808-79-8	Sulfate	45	1		EPA-300.0

3/24/15

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Tidewater Inc.
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Powell, OH 43065

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Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-300.0

MW-7

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-05
File ID: A020215A.seq-11
Sampled: 02/02/15 12:38
Prepared: 02/02/15 22:00
Analyzed: 02/03/15 01:34
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0142
Sequence: 1502033
Calibration: UNASSIGNED
Instrument: IC1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	72	1		EPA-300.0
14797-55-8	Nitrate as N	3.1	1		EPA-300.0
14808-79-8	Sulfate	46	1		EPA-300.0

3/24/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/2/2015 10:30:38AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-300.0

Dup-7-1Q15

Laboratory: BC Laboratories
SDG: 15-02486
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502486-06
File ID: A020215A.seq-12
Sampled: 02/02/15 12:53
Prepared: 02/02/15 22:00
Analyzed: 02/03/15 01:54
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0142
Sequence: 1502033
Calibration: UNASSIGNED
Instrument: IC1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	72	1		EPA-300.0
14797-55-8	Nitrate as N	3.1	1		EPA-300.0
14808-79-8	Sulfate	46	1		EPA-300.0

3/24/15

LDC #: 33815B6

SDG #: 15-02486

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 3/18/15

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), Orthophosphate (EPA Method 365.1), 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	2/2/15
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	MSD=(6,7)
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	MW-13	ClO_4	1502486-02	Water	02/02/15
2	MW-8	Cr^{+6}	1502486-03	Water	02/02/15
3	MW-10		1502486-04	Water	02/02/15
4	MW-~~4~~7 JD	Cr^{+6}	1502486-05	Water	02/02/15
5	Dup-7-1Q15		1502486-06	Water	02/02/15
6	MW-8MS	ClO_4 Cr^{+6} PO_4 NO_2-N 300.0	1502486-03MS	Water	02/02/15
7	MW-8MSD		1502486-03MSD	Water	02/02/15
8	MW-8DUP		1502486-03DUP	Water	02/02/15
9					
10					
11					
12					
13					

Notes:

LDC #: 33815B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: a

All circled methods are applicable to each sample.

Sample ID	Parameter
1	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, 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
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: 68	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# 33815B6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: SD
2nd Reviewer: CA

Inorganics: Method See Cover

Analyte	Concentration		RPD
	4	5	
Chloride	72 (mg/L)	72 (mg/L)	0
Nitrate-N	3.1 (mg/L)	3.1 (mg/L)	0
Sulfate	46 (mg/L)	46 (mg/L)	0
Orthophosphate-P	0.024 (mg/L)	0.023 (mg/L)	4
Hexavalent Chromium	0.0038 (mg/L)	0.0038 (mg/L)	0
Perchlorate	750 (ug/L)	740 (ug/L)	1

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\33815B6.wpd

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

March 26, 2015

SUBJECT: NASA JPL, 1Q2015, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on March 4, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #33857:

SDG #	Fraction
15-02883, 15-03050	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

Pei Geng
Project Manager/Senior Chemist

HC

Attachment 1

90/10 (client select)	LDC #33857 (Tidewater- Manhattan Beach, CA / NASA JPL, 1Q2015)																																						
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)		Cr(VI) (7196)		O-PO_4 (365.1)		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	W	S
A	15-02883	03/04/15	03/25/15	11	0	9	0	0	0	0	0	9	0	0	0	10	0																						
A	15-02883	03/04/15	03/25/15	1	0	1	0	1	0	1	0	1	0	1	0	1	0																						
B	15-03050	03/04/15	03/25/15	9	0	8	0	-	-	-	-	8	0	-	-	8	0																						
Total	T/PG			21	0	18	0	1	0	1	0	18	0	1	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79

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\33857ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 25, 2015

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02883

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-7-02/04/15	1502883-01	Water	02/04/15
EB-6-02/04/15	1502883-02	Water	02/04/15
MW-11-4	1502883-03	Water	02/04/15
MW-11-3	1502883-04	Water	02/04/15
MW-11-2	1502883-05	Water	02/04/15
MW-11-1**	1502883-06**	Water	02/04/15
MW-25-5	1502883-07	Water	02/04/15
MW-25-4	1502883-08	Water	02/04/15
MW-25-3	1502883-09	Water	02/04/15
MW-25-2	1502883-10	Water	02/04/15
MW-25-1	1502883-11	Water	02/04/15
MW-10	1502883-12	Water	02/04/15
MW-25-2MS	1502883-10MS	Water	02/04/15
MW-25-2MSD	1502883-10MSD	Water	02/04/15

**Indicates sample underwent EPA 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 with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
1/22/15	Pentachloroethane	33.1	All samples in SDG 15-02883	UJ (all non-detects)	P

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% with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
1/22/15 (06FEB02)	Bromomethane	35.9	All samples in SDG 15-02883	UJ (all non-detects)	P
1/22/15 (06FEB03)	Methyl iodide	50.7	All samples in SDG 15-02883	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-7-02/04/15 was identified as a trip blank. No contaminants were found.

Sample EB-6-02/04/15 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 ICV and 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, 1Q2015
Volatiles - Data Qualification Summary - SDG 15-02883

Sample	Compound	Flag	A or P	Reason
TB-7-02/04/15 EB-6-02/04/15 MW-11-4 MW-11-3 MW-11-2 MW-11-1** MW-25-5 MW-25-4 MW-25-3 MW-25-2 MW-25-1 MW-10	Pentachloroethane	UJ (all non-detects)	P	Initial calibration verification (%D)
TB-7-02/04/15 EB-6-02/04/15 MW-11-4 MW-11-3 MW-11-2 MW-11-1** MW-25-5 MW-25-4 MW-25-3 MW-25-2 MW-25-1 MW-10	Bromomethane Methyl iodide	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 1Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-02883

No Sample Data Qualified in this SDG

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-7-02/04/15

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-01	File ID:	06FEB17.D
Sampled:	02/04/15 06:30	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 11:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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

3/6/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-7-02/04/15

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-01	File ID:	06FEB17.D
Sampled:	02/04/15 06:30	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 11:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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

3/6/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-7-02/04/15

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-01	File ID:	06FEB17.D
Sampled:	02/04/15 06:30	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 11:52
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	11.320	113	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8600	98.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7400	97.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	269480	6.51	267871	6.51	
Chlorobenzene-d5 (IS)	94359	9.59	94501	9.58	
1,4-Difluorobenzene (IS)	367734	7.33	391310	7.33	

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-6-02/04/15

Laboratory:	BC Laboratories			SDG:	15-02883
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502883-02	File ID:	06FEB18.D
Sampled:	02/04/15 06:50	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 12:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence:	1501971	Calibration:	1501018
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

2/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-6-02/04/15

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-02	File ID:	06FEB18.D
Sampled:	02/04/15 06:50	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 12:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0498 Sequence: 1501971 Calibration: 1501018 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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-6-02/04/15

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-02	File ID:	06FEB18.D
Sampled:	02/04/15 06:50	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 12:15
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	10.800	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8400	98.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9500	99.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	272121	6.51	267871	6.51	
Chlorobenzene-d5 (IS)	92681	9.58	94501	9.58	
1,4-Difluorobenzene (IS)	371075	7.33	391310	7.33	

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-4

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-03	File ID:	06FEB19.D
Sampled:	02/04/15 07:30	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 12:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-4

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-03	File ID:	06FEB19.D
Sampled:	02/04/15 07:30	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 12:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence:	1501971	Calibration:	1501018	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	0.21	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	0.13	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

2/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-4

Laboratory:	BC Laboratories			SDG:	15-02883
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502883-03	File ID:	06FEB19.D
Sampled:	02/04/15 07:30	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 12:38
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0498 Sequence: 1501971 Calibration: 1501018 Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.47	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	11.430	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9300	99.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8700	98.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	268874	6.51	267871	6.51	
Chlorobenzene-d5 (IS)	90859	9.59	94501	9.58	
1,4-Difluorobenzene (IS)	363713	7.33	391310	7.33	

3/6/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-3

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-04	File ID:	06FEB20.D
Sampled:	02/04/15 08:10	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 13:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	0.22	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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-3

Laboratory:	BC Laboratories			SDG:	15-02883
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502883-04	File ID:	06FEB20.D
Sampled:	02/04/15 08:10	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 13:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence:	1501971	Calibration:	1501018
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	0.12	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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-3

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-04	File ID:	06FEB20.D
Sampled:	02/04/15 08:10	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 13:01
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	11.490	115	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7100	97.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8200	98.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	268198	6.51	267871	6.51	
Chlorobenzene-d5 (IS)	93025	9.58	94501	9.58	
1,4-Difluorobenzene (IS)	367523	7.33	391310	7.33	

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-2

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-05	File ID:	06FEB21.D
Sampled:	02/04/15 08:50	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 13:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-2

Laboratory:	BC Laboratories			SDG:	15-02883
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502883-05	File ID:	06FEB21.D
Sampled:	02/04/15 08:50	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 13:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0498 Sequence: 1501971 Calibration: 1501018 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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-2

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-05	File ID:	06FEB21.D
Sampled:	02/04/15 08:50	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 13:23
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.42	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	11.130	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8400	98.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6200	96.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	272636	6.51	267871	6.51	
Chlorobenzene-d5 (IS)	91976	9.58	94501	9.58	
1,4-Difluorobenzene (IS)	361119	7.33	391310	7.33	

3/26/15

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-1

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1502883-06		File ID:	06FEB22.D
Sampled:	02/04/15 09:25	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 13:46
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-1

Laboratory:	BC Laboratories			SDG:	15-02883
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502883-06	File ID:	06FEB22.D
Sampled:	02/04/15 09:25	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 13:46
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0498 Sequence: 1501971 Calibration: 1501018 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	0.14	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

3/06/15

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-11-1

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1502883-06		File ID:	06FEB22.D
Sampled:	02/04/15 09:25	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 13:46
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	11.440	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.040	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9800	99.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	269473	6.51	267871	6.51	
Chlorobenzene-d5 (IS)	90120	9.58	94501	9.58	
1,4-Difluorobenzene (IS)	363095	7.33	391310	7.33	

3/6/15

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-5

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-07	File ID:	06FEB23.D
Sampled:	02/04/15 10:40	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 14:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-5

Laboratory:	BC Laboratories			SDG:	15-02883
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502883-07	File ID:	06FEB23.D
Sampled:	02/04/15 10:40	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 14:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0498 Sequence: 1501971 Calibration: 1501018 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

3/26/15

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Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-5

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-07	File ID:	06FEB23.D
Sampled:	02/04/15 10:40	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 14:09
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	Instrument: MS-V5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.49	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	11.380	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.5500	95.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6400	96.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	260884	6.51	267871	6.51	
Chlorobenzene-d5 (IS)	90383	9.58	94501	9.58	
1,4-Difluorobenzene (IS)	357964	7.33	391310	7.33	

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Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-4

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-08	File ID:	06FEB24.D
Sampled:	02/04/15 11:30	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 14:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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

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Project: JPL- GW Monitoring Wells
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Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-4

Laboratory:	BC Laboratories			SDG:	15-02883
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502883-08	File ID:	06FEB24.D
Sampled:	02/04/15 11:30	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 14:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence:	1501971	Calibration:	1501018
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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Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-4

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-08	File ID:	06FEB24.D
Sampled:	02/04/15 11:30	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 14:32
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	11.870	119	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7400	97.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9500	99.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	258819	6.51	267871	6.51	
Chlorobenzene-d5 (IS)	88804	9.58	94501	9.58	
1,4-Difluorobenzene (IS)	362440	7.33	391310	7.33	

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Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-3

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-09	File ID:	06FEB25.D
Sampled:	02/04/15 12:20	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 14:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	0.11	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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Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-3

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-09	File ID:	06FEB25.D
Sampled:	02/04/15 12:20	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 14:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	0.27	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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Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-3

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-09	File ID:	06FEB25.D
Sampled:	02/04/15 12:20	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 14:54
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	11.410	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.150	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4800	94.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	253932	6.51	267871	6.51	
Chlorobenzene-d5 (IS)	85910	9.58	94501	9.58	
1,4-Difluorobenzene (IS)	336844	7.33	391310	7.33	

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Reported: 3/3/2015 9:25:50AM
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Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-2

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-10	File ID:	06FEB07.D
Sampled:	02/04/15 13:00	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 08:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	0.17	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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-2

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-10	File ID:	06FEB07.D
Sampled:	02/04/15 13:00	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 08:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB0498 Sequence: 1501971 Calibration: 1501018 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	0.15	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	0.34	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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-2

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-10	File ID:	06FEB07.D
Sampled:	02/04/15 13:00	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 08:04
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	11.080	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7500	97.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1700	91.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	271032	6.51	267871	6.51	
Chlorobenzene-d5 (IS)	92396	9.58	94501	9.58	
1,4-Difluorobenzene (IS)	361202	7.33	391310	7.33	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-1

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-11	File ID:	06FEB26.D
Sampled:	02/04/15 13:40	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 15:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	0.63	
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-1

Laboratory:	BC Laboratories			SDG:	15-02883
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502883-11	File ID:	06FEB26.D
Sampled:	02/04/15 13:40	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 15:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence:	1501971	Calibration:	1501018
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	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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-25-1

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-11	File ID:	06FEB26.D
Sampled:	02/04/15 13:40	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 15:17
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	11.110	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6200	96.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6400	96.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	253445	6.51	267871	6.51	
Chlorobenzene-d5 (IS)	86265	9.59	94501	9.58	
1,4-Difluorobenzene (IS)	349962	7.33	391310	7.33	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories			SDG:	15-02883
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502883-12	File ID:	06FEB27.D
Sampled:	02/04/15 15:11	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 15:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence:	1501971	Calibration:	1501018	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	0.85	
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	0.40	J
156-60-5	trans-1,2-Dichloroethene	1	0.58	
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories			SDG:	15-02883
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1502883-12	File ID:	06FEB27.D
Sampled:	02/04/15 15:11	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 15:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence:	1501971	Calibration:	1501018
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	0.98	
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	9.2	
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:25:50AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-10

Laboratory:	BC Laboratories		SDG:	15-02883	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1502883-12	File ID:	06FEB27.D
Sampled:	02/04/15 15:11	Prepared:	02/06/15 07:15	Analyzed:	02/06/15 15:40
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB0498	Sequence: 1501971	Calibration:	1501018	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	11.700	117	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8200	98.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1600	91.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	254374	6.51	267871	6.51	
Chlorobenzene-d5 (IS)	88639	9.58	94501	9.58	
1,4-Difluorobenzene (IS)	348363	7.33	391310	7.33	

3/4/15

LDC #: 33857A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 3/13/15

SDG #: 15-02883 Level III/IV Page: 1 of 2

Laboratory: BC Laboratories, Inc. Reviewer: BZ

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 / SW	RSD ≤ 20%, r² ; CV ≤ 30%
IV.	Continuing calibration	SW	CV ≤ 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-7-02/04/15	1502883-01	Water	02/04/15
2	EB-6-02/04/15	1502883-02	Water	02/04/15
3	MW-11-4	1502883-03	Water	02/04/15
4	MW-11-3	1502883-04	Water	02/04/15
5	MW-11-2	1502883-05	Water	02/04/15
6	MW-11-1**	1502883-06**	Water	02/04/15
7	MW-25-5	1502883-07	Water	02/04/15
8	MW-25-4	1502883-08	Water	02/04/15
9	MW-25-3	1502883-09	Water	02/04/15
10	MW-25-2	1502883-10	Water	02/04/15
11	MW-25-1	1502883-11	Water	02/04/15
12	MW-10	1502883-12	Water	02/04/15
13	MW-25-2MS	1502883-10MS	Water	02/04/15

LDC #: 33857A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 3/13/15

SDG #: 15-02883 Level III/IV Page: 2 of 2

Laboratory: BC Laboratories, Inc. Reviewer: BA

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14	MW-25-2MSD	1502883-10MSD	Water	02/04/15
15				
16				
17				
18				
19				

Notes:

T	BYB0498-BLK1						

LDC #: 33457A1

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 #: 38857A1

VALIDATION FINDINGS CHECKLIST

Reviewer: BR
2nd Reviewer:

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	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Pentachloroethane
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. Methyl iodide
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33857001

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: SR
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 an initial calibration verification standard analyzed after each ICAL for each instrument?
Y N N/A Were all %D within the validation criteria of ≤30 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	1/22/15	ICV - MSV5	PFPP	33.1	All	J / UJ / P (ND)

LDC #: 33857A1

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
	1/22/15	CCV-06FEB02	B	35.9	All	J/UJ/P (ND)
	1/22/15	CCV-06FEB03	QQQQ	50.7	All	J/UJ/P (ND)

LDC #: 33857A1

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	1/22/2015	1,1-Dichloroethene (IS1)	0.953157	0.953157	0.9317342	0.9317342	12.88825	12.88825
	MS-V5		Trichloroethene (IS2)	0.353078	0.353078	0.3347186	0.3347186	11.84779	11.84778
			1,1,2,2-Tetrachloethane	0.642118	0.642118	0.6044214	0.6044215	5.315305	5.315310

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 #: 33857A1

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	1/22/2015	Allyl chloride (IS1)	0.711435	0.711435	0.716758	0.716758	7.687894	7.687887
	MS-V5		Methyl methacrylate (IS	0.091910	0.091910	0.09828363	0.09828363	12.8917	12.8917
			Pentachloroethane (IS3	0.690898	0.690898	0.6701268	0.6701268	3.859368	3.859352

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#: 33815A1

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	06FEB02	2/6/2015	1,1-Dichloroethene (IS1)	0.931734	0.815224	0.815224	12.5	12.5
			Trichloroethene (IS2)	0.334719	0.3063378	0.3063378	8.5	8.5
			1,1,2,2-Tetrachloethane	0.604421	0.6365650	0.6365650	5.3	5.3
2	06FEB03	2/6/2015	Allyl chloride (IS1)	0.716758	0.722076	0.722076	0.7	0.7
			Methyl methacrylate (IS2	0.098284	0.08442475	0.08442475	14.1	14.1
			Pentachloroethane (IS3	0.670127	0.6249934	0.6249934	6.7	6.7

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 #: 33857A1

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: 6

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.00	10.04	100	100	0
Bromofluorobenzene	↓	9.98	99.8	99.8	0
1,2-Dichlorobenzene-d4	↓	11.44	114	114	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#: 33857A1

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: 13/14

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	24.250	24.740	97.0%	97.0%	99.0%	99.0%	2.00%	2.00%
Trichloroethene	25.00	25.00	0.34	24.120	25.020	95.1%	95.1%	98.7%	98.7%	3.66%	3.66%
Benzene	25.00	25.00	0	23.430	23.920	93.7%	93.7%	95.7%	95.7%	2.07%	2.07%
Toluene	25.00	25.00	0	24.890	25.170	100%	100%	101%	101%	1.12%	1.12%
Chlorobenzene	25.00	25.00	0	24.990	25.890	100%	100%	104%	104%	3.54%	3.54%

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 #: 33857a1

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/B0498-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	—	23.020	—	92.1	92.1				
Trichloroethene			23.270		93.1	93.1				
Benzene			21.990		88.0	88.0				
Toluene			23.860		95.4	95.4				
Chlorobenzene			23.630		94.5	94.5				

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

LDC #: 338571-1

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:

DF = 0.14

Sample I.D. 6, FF:

Conc. = $\frac{(4355)(10)(\quad)(\quad)}{(90120)(3.411726)(\quad)}$

= 0.141642254 ug/L

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

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 25, 2015

Parameters: Chromium

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02883

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-6-02/04/15	1502883-02	Water	02/04/15
MW-11-3	1502883-04	Water	02/04/15
MW-11-2	1502883-05	Water	02/04/15
MW-11-1**	1502883-06**	Water	02/04/15
MW-25-5	1502883-07	Water	02/04/15
MW-25-4	1502883-08	Water	02/04/15
MW-25-3	1502883-09	Water	02/04/15
MW-25-2	1502883-10	Water	02/04/15
MW-25-1	1502883-11	Water	02/04/15
MW-10	1502883-12	Water	02/04/15
MW-25-2MS	1502883-10MS	Water	02/04/15
MW-25-2MSD	1502883-10MSD	Water	02/04/15
MW-25-2DUP	1502883-10DUP	Water	02/04/15

**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 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 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. 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(s).

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

IV. ICP Interference Check Sample (ICS) 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-6-02/04/15 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. ICP Serial Dilution

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

X. Laboratory Control Samples (LCS)

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)

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, 1Q2015
Chromium - Data Qualification Summary - SDG 15-02883

No Sample Data Qualified in this SDG

NASA JPL, 1Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-02883

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:32:23AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-6-02/04/15

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-02
File ID: PE_EL2_150209-147
Sampled: 02/04/15 06:50
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 20:55
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0543
Sequence: 1502120
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

3/6/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:32:23AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-11-3

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-04
File ID: PE_EL2_150209-148
Sampled: 02/04/15 08:10
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 20:58
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0543
Sequence: 1502120
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:32:23AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-11-2

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-05
File ID: PE_EL2_150209-149
Sampled: 02/04/15 08:50
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 21:02
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0543
Sequence: 1502120
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:32:23AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-11-1

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-06
File ID: PE_EL2_150209-150
Sampled: 02/04/15 09:25
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 21:05
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0543
Sequence: 1502120
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

3/6/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:32:23AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-25-5

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-07
File ID: PE_EL2_150209-151
Sampled: 02/04/15 10:40
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 21:09
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0543
Sequence: 1502120
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:32:23AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-25-4

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-08
File ID: PE_EL2_150209-152
Sampled: 02/04/15 11:30
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 21:12
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0543
Sequence: 1502120
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:32:23AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-25-3

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-09
File ID: PE_EL2_150209-153
Sampled: 02/04/15 12:20
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 21:15
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0543
Sequence: 1502120
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:32:23AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-25-2

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-10
File ID: PE_EL2_150209-139
Sampled: 02/04/15 13:00
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 20:27
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0543
Sequence: 1502120
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:32:23AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-25-1

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-11
File ID: PE_EL2_150209-154
Sampled: 02/04/15 13:40
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 21:19
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0543
Sequence: 1502120
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	EPA-200.8

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:32:23AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-10

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-12
File ID: PE_EL2_150209-155
Sampled: 02/04/15 15:11
Prepared: 02/06/15 08:30
Analyzed: 02/09/15 21:22
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0543
Sequence: 1502120
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	4.4	1		EPA-200.8

3/26/15

LDC #: 33857A4a

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/19/15

SDG #: 15-02883

Page: 1 of 1

Laboratory: BC Laboratories, Inc.

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	2/4/15
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 = (11,12)
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) JD	~~N~~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-6-02/04/15	1502883-02	Water	02/04/15
2	MW-11-3	1502883-04	Water	02/04/15
3	MW-11-2	1502883-05	Water	02/04/15
4	MW-11-1**	1502883-06**	Water	02/04/15
5	MW-25-5	1502883-07	Water	02/04/15
6	MW-25-4	1502883-08	Water	02/04/15
7	MW-25-3	1502883-09	Water	02/04/15
8	MW-25-2	1502883-10	Water	02/04/15
9	MW-25-1	1502883-11	Water	02/04/15
10	MW-10	1502883-12	Water	02/04/15
11	MW-25-2MS	1502883-10MS	Water	02/04/15
12	MW-25-2MSD	1502883-10MSD	Water	02/04/15
13	MW-25-2DUP	1502883-10DUP	Water	02/04/15
14				
15				

LDC #: 53857A4G

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: JD
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 #: 33857A4a

VALIDATION FINDINGS CHECKLIST

Reviewer: ZD
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 #: 33857A4G

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: JD
2nd Reviewer: [illegible]

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

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 13:03	ICP/MS (Initial calibration)	Cr	55.05 ug/L	50 ug/L	110%R	110%R	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV 20:48 (B)	ICP/MS (Continuing calibration)	Cr	41.035 ug/L	40 ug/L	103%R	103%R	Y
	CVAA (Continuing calibration)						
	GFAA (Initial calibration)						
	GFAA (Continuing calibation)						

Comments:

LDC #: 33857A4a

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/A	ICP interference check						
LCS 20:20	Laboratory control sample	Cr	43.395 ug/L	40 ug/L	108%R	108%R	Y
MS 20:37	Matrix spike	↓	(SSR-SR) 41.17 ug/L	40 ug/L	103%R	103%R	↓
DUP	Duplicate	↓	2.652 ug/L	2.41 ug/L	11.1%RPD	11.1%RPD	↓
SER 20:34	ICP serial dilution	↓	2.535 ug/L	2.41 ug/L	5.19%D	5.06%D	Y*

Comments: *Rounding

TOTCLC.4SW

LDC #: 33857A4c

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 ND 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)
	4	Cr	ND	ND	ND

Note:

RECALC.4SW

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 25, 2015

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-02883

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-6-02/04/15	1502883-02	Water	02/04/15
MW-11-4	1502883-03	Water	02/04/15
MW-11-3	1502883-04	Water	02/04/15
MW-11-2	1502883-05	Water	02/04/15
MW-11-1**	1502883-06**	Water	02/04/15
MW-25-5	1502883-07	Water	02/04/15
MW-25-4	1502883-08	Water	02/04/15
MW-25-3	1502883-09	Water	02/04/15
MW-25-2	1502883-10	Water	02/04/15
MW-25-1	1502883-11	Water	02/04/15
MW-10	1502883-12	Water	02/04/15
EB-6-02/04/15MS	1502883-02MS	Water	02/04/15
EB-6-02/04/15MSD	1502883-02MSD	Water	02/04/15
EB-6-02/04/15DUP	1502883-02DUP	Water	02/04/15
MW-11-1MS	1502883-06MS	Water	02/04/15
MW-11-1MSD	1502883-06MSD	Water	02/04/15
MW-11-1DUP	1502883-06DUP	Water	02/04/15
MW-25-2MS	1502883-10MS	Water	02/04/15
MW-25-2MSD	1502883-10MSD	Water	02/04/15
MW-25-2DUP	1502883-10DUP	Water	02/04/15

**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 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 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 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. 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 method(s). No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample EB-6-02/04/15 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 method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

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

XI. Overall Assessment of Data

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

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

NASA JPL, 1Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-02883

No Sample Data Qualified in this SDG

NASA JPL, 1Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-02883

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-6-02/04/15

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-02
File ID: 150204 0718 CR6-290
Sampled: 02/04/15 06:50
Prepared: 02/05/15 01:04
Analyzed: 02/05/15 01:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0695
Sequence: 1502166
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

3/6/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-11-3

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-04
File ID: 150204 0718 CR6-291
Sampled: 02/04/15 08:10
Prepared: 02/05/15 01:04
Analyzed: 02/05/15 01:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0695
Sequence: 1502166
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-11-2

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-05
File ID: 150204 0718 CR6-292
Sampled: 02/04/15 08:50
Prepared: 02/05/15 01:04
Analyzed: 02/05/15 01:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0695
Sequence: 1502166
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

3/26/15 T

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-11-1

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-06
File ID: 150204 0718 CR6-293
Sampled: 02/04/15 09:25
Prepared: 02/05/15 01:04
Analyzed: 02/05/15 01:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0695
Sequence: 1502166
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-5

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-07
File ID: 150204 0718 CR6-296
Sampled: 02/04/15 10:40
Prepared: 02/05/15 01:04
Analyzed: 02/05/15 01:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0695
Sequence: 1502166
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065	Reported: 3/3/2015 9:27:58AM Project: JPL- GW Monitoring Wells Project Number: 1Q15 Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-4

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-08
File ID: 150204 0718 CR6-297
Sampled: 02/04/15 11:30
Prepared: 02/05/15 01:04
Analyzed: 02/05/15 01:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0695
Sequence: 1502166
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-3

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-09
File ID: 150204 0718 CR6-305
Sampled: 02/04/15 12:20
Prepared: 02/05/15 01:04
Analyzed: 02/05/15 01:30
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0695
Sequence: 1502166
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0033	1		EPA-7196

3/26/15

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

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-2

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-10
File ID: 150204 0718 CR6-286
Sampled: 02/04/15 13:00
Prepared: 02/05/15 01:04
Analyzed: 02/05/15 01:04
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0695
Sequence: 1502166
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-25-1

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-11
File ID: 150204 0718 CR6-299
Sampled: 02/04/15 13:40
Prepared: 02/05/15 01:04
Analyzed: 02/05/15 01:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0695
Sequence: 1502166
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-10

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-12
File ID: 150204 0718 CR6-300
Sampled: 02/04/15 15:11
Prepared: 02/05/15 01:04
Analyzed: 02/05/15 01:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0695
Sequence: 1502166
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

3/26/15 F

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

EB-6-02/04/15

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-02
File ID: F022415.seq-13.0000.txt
Sampled: 02/04/15 06:50
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 03:51
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2169
Sequence: 1503064
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

3/26/15 O

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-11-4

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-03
File ID: F022415.seq-19.0000.txt
Sampled: 02/04/15 07:30
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 05:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2169
Sequence: 1503064
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-11-3

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-04
File ID: F022415.seq-20.0000.txt
Sampled: 02/04/15 08:10
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 05:28
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2169
Sequence: 1503064
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

3/26/15 [illegible]

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-11-2

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-05
File ID: F022415.seq-21.0000.txt
Sampled: 02/04/15 08:50
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 05:42
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2169
Sequence: 1503064
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-11-1

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-06
File ID: F022415.seq-22.0000.txt
Sampled: 02/04/15 09:25
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 05:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2169
Sequence: 1503064
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-25-5

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-07
File ID: F022415.seq-23.0000.txt
Sampled: 02/04/15 10:40
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 06:10
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2169
Sequence: 1503064
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-25-4

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-08RE1
File ID: F022415.seq-70.0000.txt
Sampled: 02/04/15 11:30
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 17:42
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2169
Sequence: 1503064
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	10	1		EPA-314.0

3/06/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-25-3

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-09RE1
File ID: F022415.seq-71.0000.txt
Sampled: 02/04/15 12:20
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 17:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2170
Sequence: 1503064
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	9.8	1		EPA-314.0

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-25-2

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-10
File ID: F022415.seq-30.0000.txt
Sampled: 02/04/15 13:00
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 07:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2170
Sequence: 1503064
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	15	1		EPA-314.0

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-25-1

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-11
File ID: F022415.seq-34.0000.txt
Sampled: 02/04/15 13:40
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 08:42
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2170
Sequence: 1503064
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	9.5	1		EPA-314.0

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-10

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-12
File ID: F022415.seq-35.0000.txt
Sampled: 02/04/15 15:11
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 08:56
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2170
Sequence: 1503064
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.3	1		EPA-314.0

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-300.0

MW-11-1

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-06
File ID: B020515.seq-28
Sampled: 02/04/15 09:25
Prepared: 02/05/15 12:00
Analyzed: 02/06/15 01:36
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0513
Sequence: 1502288
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	0.18	1		EPA-300.0
14808-79-8	Sulfate	31	1		EPA-300.0

2/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-353.2

MW-11-1

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-06
File ID: 150205 1058 NO2-122
Sampled: 02/04/15 09:25
Prepared: 02/05/15 10:58
Analyzed: 02/05/15 10:59
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0469
Sequence: 1502180
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

3/6/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:27:58AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-365.1

MW-11-1

Laboratory: BC Laboratories
SDG: 15-02883
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1502883-06
File ID: 150205 0918 PO4-101
Sampled: 02/04/15 09:25
Prepared: 02/05/15 09:18
Analyzed: 02/05/15 10:06
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0465
Sequence: 1502177
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
---	ortho-Phosphate as P	0.015	1	J	EPA-365.1

3/26/15

LDC #: 33857A6

SDG #: 15-02883

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/19/15

Page: 1 of 2

Reviewer: JD

2nd Reviewer: CL

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Hexavalent Chromium (EPA SW846 Method 7196), Nitrite-N (EPA Method 353.2), Orthophosphate (EPA Method 365.1), 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	2/4/5
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=(12,13)(15,16)(18,19)
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-6-02/04/15	Cr^{+6}	1502883-02	Water	02/04/15
2	MW-11-4		1502883-03	Water	02/04/15
3	MW-11-3	Cr^{+6}	1502883-04	Water	02/04/15
4	MW-11-2		1502883-05	Water	02/04/15
5	MW-11-1**	OPO_4, NO_2, 300.0	1502883-06**	Water	02/04/15
6	MW-25-5		1502883-07	Water	02/04/15
7	MW-25-4		1502883-08	Water	02/04/15
8	MW-25-3		1502883-09	Water	02/04/15
9	MW-25-2		1502883-10	Water	02/04/15
10	MW-25-1		1502883-11	Water	02/04/15
11	MW-10		1502883-12	Water	02/04/15
12	EB-6-02/04/15MS	314.0	1502883-02MS	Water	02/04/15
13	EB-6-02/04/15MSD		1502883-02MSD	Water	02/04/15
14	EB-6-02/04/15DUP		1502883-02DUP	Water	02/04/15
15	MW-11-1MS	OPO_4 NO_2 300.0	1502883-06MS	Water	02/04/15
16	MW-11-1MSD		1502883-06MSD	Water	02/04/15

* Samples recalc = rounded = not enough sig figs reported

LDC #: 33857A6

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/9/15

SDG #: 15-02883

Page: 2 of 2

Laboratory: BC Laboratories, Inc.

Reviewer: 3D

2nd Reviewer: CL

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

	Client ID		Lab ID	Matrix	Date
17	MW-11-1DUP	PO_4, NO_2, 300.0	1502883-06DUP	Water	02/04/15
18	MW-25-2MS	Cr^{+6} 314.0	1502883-10MS	Water	02/04/15
19	MW-25-2MSD	↓ ↓	1502883-10MSD	Water	02/04/15
20	MW-25-2DUP		1502883-10DUP	Water	02/04/15
21					
22					
23					
24					
25					

Notes:

LDC #: 33857A6

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~~ 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 #: 33857A6

VALIDATION FINDINGS CHECKLIST

Reviewer: 3D
2nd Reviewer: a

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 #: 33857A0

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Parameter
1, 3-4, 6-11	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
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
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
QC: 12-14	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
QC: 18-20	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 #: 33857A6

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 NO_2-N was recalculated. Calibration date: 3/1/15

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	NO_2-N	s1	0.00	0.01	0.999992	0.999990	y*
		s2	0.02	0.021			
		s3	0.05	0.036			
		s4	0.1	0.065			
		s5	0.5	0.285			
		s6	1	0.557			
ICV 12:04 Calibration verification	Cl	Found 49.46 mg/L	True 50 mg/L		99.0%R	99.0%R	y
ICV 1:47 Calibration verification	ClO_4	10 ug/L	10 ug/L		100%R	95.5%R	y*
CCV Calibration verification	NO_2-N	4.762 mg/L	0.5 mg/L		95.2%R	95.4%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 #: 33857A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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	Laboratory control sample	SO_4	106 mg/L	100 mg/L	106%R	103%R	y*
MS	Matrix spike sample	Cr^{+6}	(SSR-SR) 0.054 mg/L	0.052632 mg/L	103%R	103%R	y
DUP	Duplicate sample	OPO_4-P	0.01676 mg/L	0.01676 mg/L	0%RPD	0.292%RPD	y*

Comments: *Rounding

TOTCLC.6

LDC #: 33857A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 (5) NO_3-N reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{\sqrt{4a(A-c)+b^2} - b}{2a}$

Recalculation: $\frac{\sqrt{4(0.0087(0.067-(-0.031)+0.441^2} - 0.441}{2(0.0087)} = 0.18$ mg

c = -0.031
a = 0.0087
b = 0.441
A = 0.067

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	5	NO_3-N	0.18	0.18	Y
		OPO_4-P	0.015	0.017	Y*

Note: CO_4 = ND
NO_2-N = ND
Cr^{+6} = ND

* Rounding

RECALC.6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 25, 2015

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-03050

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-8-02/05/15	1503050-01	Water	02/05/15
EB-7-02/05/15	1503050-02	Water	02/05/15
MW-3-4	1503050-03	Water	02/05/15
MW-3-3	1503050-04	Water	02/05/15
MW-3-2	1503050-05	Water	02/05/15
MW-21-5	1503050-06	Water	02/05/15
MW-21-4	1503050-07	Water	02/05/15
MW-21-3	1503050-08	Water	02/05/15
MW-21-2	1503050-09	Water	02/05/15
MW-21-3MS	1503050-08MS	Water	02/05/15
MW-21-3MSD	1503050-08MSD	Water	02/05/15
MW-3-4MS	1503050-03MS	Water	02/05/15
MW-3-4MSD	1503050-03MSD	Water	02/05/15

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 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 with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/11/15	Pentachloroethane	60.8	All samples in SDG 15-03050	UJ (all non-detects)	P

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% with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/13/15 (13FEB02)	Carbon tetrachloride	31.3	All samples in SDG 15-03050	UJ (all non-detects)	P
2/13/15 (13FEB03)	trans-1,4-Dichloro-2-butene Pentachloroethane	36.0 116	All samples in SDG 15-03050	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-8-02/05/15 was identified as a trip blank. No contaminants were found.

Sample EB-7-02/05/15 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 with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
MW-21-3MS/MSD (MW-21-3)	Bromodichloromethane	-	132 (70-130)	NA	-

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 ICV and 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, 1Q2015
Volatiles - Data Qualification Summary - SDG 15-03050

Sample	Compound	Flag	A or P	Reason
TB-8-02/05/15 EB-7-02/05/15 MW-3-4 MW-3-3 MW-3-2 MW-21-5 MW-21-4 MW-21-3 MW-21-2	Pentachloroethane	UJ (all non-detects)	P	Initial calibration verification (%D)
TB-8-02/05/15 EB-7-02/05/15 MW-3-4 MW-3-3 MW-3-2 MW-21-5 MW-21-4 MW-21-3 MW-21-2	Carbon tetrachloride trans-1,4-Dichloro-2-butene Pentachloroethane	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 1Q2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15-03050

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-8-02/05/15

Laboratory: BC Laboratories | SDG: 15-03050
Client: Tidewater Inc. | Project: JPL- GW Monitoring Wells
Matrix: Water | Laboratory ID: 1503050-01 | File ID: 13FEB13.D
Sampled: 02/05/15 06:30 | Prepared: 02/13/15 07:00 | Analyzed: 02/13/15 10:03
Solids: | Preparation: EPA 5030 Water MS | Initial/Final: 25 ml / 25 ml
Batch: BYB1178 | Sequence: 1502399 | Calibration: 1502012 | 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 UJ
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-8-02/05/15

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-01	File ID:	13FEB13.D
Sampled:	02/05/15 06:30	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 10:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence:	1502399	Calibration:	1502012	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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

TB-8-02/05/15

Laboratory:	BC Laboratories		SDG:	15-03050	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1503050-01		File ID:	13FEB13.D
Sampled:	02/05/15 06:30	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 10:03
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence: 1502399	Calibration:	1502012	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 UJ
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
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	11.070	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.240	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9500	89.5	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	198258	6.51	179442	6.51	
Chlorobenzene-d5 (IS)	63327	9.59	58836	9.58	
1,4-Difluorobenzene (IS)	224369	7.33	219625	7.33	

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-7-02/05/15

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-02	File ID:	13FEB14.D
Sampled:	02/05/15 06:50	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 10:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence:	1502399	Calibration:	1502012	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 UJ
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-7-02/05/15

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-02	File ID:	13FEB14.D
Sampled:	02/05/15 06:50	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 10:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB1178 Sequence: 1502399 Calibration: 1502012 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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

EB-7-02/05/15

Laboratory:	BC Laboratories		SDG:	15-03050	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1503050-02	File ID:	13FEB14.D
Sampled:	02/05/15 06:50	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 10:26
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence: 1502399	Calibration:	1502012	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 UJ
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
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	11.450	114	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.410	104	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2800	92.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	194868	6.51	179442	6.51	
Chlorobenzene-d5 (IS)	61488	9.58	58836	9.58	
1,4-Difluorobenzene (IS)	222629	7.33	219625	7.33	

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-4

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-03	File ID:	13FEB07.D
Sampled:	02/05/15 07:20	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 07:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence:	1502399	Calibration:	1502012	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 US
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	0.24	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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-4

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-03	File ID:	13FEB07.D
Sampled:	02/05/15 07:20	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 07:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence:	1502399	Calibration:	1502012
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	0.27	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	0.10	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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-4

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-03	File ID:	13FEB07.D
Sampled:	02/05/15 07:20	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 07:47
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence:	1502399	Calibration:	1502012
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 UJ
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
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	11.200	112	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.060	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7300	97.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	185088	6.51	179442	6.51	
Chlorobenzene-d5 (IS)	55606	9.58	58836	9.58	
1,4-Difluorobenzene (IS)	214108	7.33	219625	7.33	

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-3

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-04	File ID:	13FEB15.D
Sampled:	02/05/15 08:10	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 10:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence:	1502399	Calibration:	1502012
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 US
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	0.16	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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-3

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-04	File ID:	13FEB15.D
Sampled:	02/05/15 08:10	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 10:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence:	1502399	Calibration:	1502012
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	0.17	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

3/06/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-3

Laboratory:	BC Laboratories		SDG:	15-03050	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1503050-04	File ID:	13FEB15.D
Sampled:	02/05/15 08:10	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 10:49
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence: 1502399	Calibration:	1502012	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 UJ
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
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	11.570	116	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9200	99.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9800	89.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	189892	6.51	179442	6.51	
Chlorobenzene-d5 (IS)	60712	9.58	58836	9.58	
1,4-Difluorobenzene (IS)	219411	7.33	219625	7.33	

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-2

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-05	File ID:	13FEB16.D
Sampled:	02/05/15 08:45	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 11:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB1178 Sequence: 1502399 Calibration: 1502012 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	0.58	
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 UJ
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	2.1	
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-2

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-05	File ID:	13FEB16.D
Sampled:	02/05/15 08:45	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 11:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence:	1502399	Calibration:	1502012
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: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-3-2

Laboratory:	BC Laboratories		SDG:	15-03050	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1503050-05	File ID:	13FEB16.D
Sampled:	02/05/15 08:45	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 11:11
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence: 1502399	Calibration:	1502012	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 UJ
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
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	11.870	119	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9800	99.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6700	86.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	185799	6.51	179442	6.51	
Chlorobenzene-d5 (IS)	60893	9.58	58836	9.58	
1,4-Difluorobenzene (IS)	221944	7.33	219625	7.33	

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Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-5

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-06	File ID:	13FEB17.D
Sampled:	02/05/15 10:20	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 11:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence:	1502399	Calibration:	1502012
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 UJ
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	7.2	
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

3/26/15 X

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-5

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-06	File ID:	13FEB17.D
Sampled:	02/05/15 10:20	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 11:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB1178 Sequence: 1502399 Calibration: 1502012 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	0.83	
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	0.15	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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-5

Laboratory:	BC Laboratories		SDG:	15-03050	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1503050-06	File ID:	13FEB17.D
Sampled:	02/05/15 10:20	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 11:34
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence: 1502399	Calibration:	1502012	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 UJ
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
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	11.640	116	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8600	98.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9600	89.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	187413	6.51	179442	6.51	
Chlorobenzene-d5 (IS)	60104	9.58	58836	9.58	
1,4-Difluorobenzene (IS)	219484	7.33	219625	7.33	

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-4

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-07	File ID:	13FEB18.D
Sampled:	02/05/15 11:00	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 11:57
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence:	1502399	Calibration:	1502012
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 UJ
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	6.1	
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-4

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-07	File ID:	13FEB18.D
Sampled:	02/05/15 11:00	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 11:57
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB1178 Sequence: 1502399 Calibration: 1502012 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	0.71	
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	0.15	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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-4

Laboratory:	BC Laboratories		SDG:	15-03050	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1503050-07	File ID:	13FEB18.D
Sampled:	02/05/15 11:00	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 11:57
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence: 1502399	Calibration:	1502012	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 UJ
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
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	11.730	117	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.230	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.9700	89.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	188670	6.51	179442	6.51	
Chlorobenzene-d5 (IS)	59963	9.58	58836	9.58	
1,4-Difluorobenzene (IS)	220003	7.33	219625	7.33	

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BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-3

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-08	File ID:	13FEB21.D
Sampled:	02/05/15 11:35	Prepared:	02/13/15 07:44	Analyzed:	02/13/15 13:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml

Batch: BYB1179 Sequence: 1502399 Calibration: 1502012 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 UJ
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	1.5	
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	0.36	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	0.69	
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: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-3

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-08	File ID:	13FEB21.D
Sampled:	02/05/15 11:35	Prepared:	02/13/15 07:44	Analyzed:	02/13/15 13:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1179	Sequence:	1502399	Calibration:	1502012
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	0.25	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	7.4	
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	2.2	
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-3

Laboratory:	BC Laboratories		SDG:	15-03050	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID:	1503050-08	File ID:	13FEB21.D
Sampled:	02/05/15 11:35	Prepared:	02/13/15 07:44	Analyzed:	02/13/15 13:05
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1179	Sequence: 1502399	Calibration:	1502012	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 UJ
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
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	11.890	119	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.560	106	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0000	90.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	187264	6.51	179442	6.51	
Chlorobenzene-d5 (IS)	57679	9.59	58836	9.58	
1,4-Difluorobenzene (IS)	209385	7.33	219625	7.33	

3/6/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-2

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-09	File ID:	13FEB19.D
Sampled:	02/05/15 12:50	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 12:20
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence:	1502399	Calibration:	1502012
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 US
108-90-7	Chlorobenzene	1	0.093	U
75-00-3	Chloroethane	1	0.14	U
67-66-3	Chloroform	1	0.34	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

3/6/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-2

Laboratory:	BC Laboratories			SDG:	15-03050
Client:	Tidewater Inc.			Project:	JPL- GW Monitoring Wells
Matrix:	Water	Laboratory ID:	1503050-09	File ID:	13FEB19.D
Sampled:	02/05/15 12:50	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 12:20
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence:	1502399	Calibration:	1502012
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	0.14	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	1.1	
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	0.30	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

3/6/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:04AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET
EPA-524.2

MW-21-2

Laboratory:	BC Laboratories		SDG:	15-03050	
Client:	Tidewater Inc.		Project:	JPL- GW Monitoring Wells	
Matrix:	Water	Laboratory ID: 1503050-09		File ID:	13FEB19.D
Sampled:	02/05/15 12:50	Prepared:	02/13/15 07:00	Analyzed:	02/13/15 12:20
Solids:		Preparation:	EPA 5030 Water MS	Initial/Final:	25 ml / 25 ml
Batch:	BYB1178	Sequence: 1502399	Calibration:	1502012	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 UJ
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
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	11.790	118	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.250	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.8000	88.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190750	6.51	179442	6.51	
Chlorobenzene-d5 (IS)	62089	9.58	58836	9.58	
1,4-Difluorobenzene (IS)	218236	7.33	219625	7.33	

3/26/15

LDC #: 33857B1

SDG #: 15-03050

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 3/13/15

Page: 1 of 2

Reviewer: BR

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 / SW	RSD ≤ 20%, r^2 LCV ≤ 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	SW 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-8-02/05/15	1503050-01	Water	02/05/15
2	EB-7-02/05/15	1503050-02	Water	02/05/15
3	MW-3-4	1503050-03	Water	02/05/15
4	MW-3-3	1503050-04	Water	02/05/15
5	MW-3-2	1503050-05	Water	02/05/15
6	MW-21-5	1503050-06	Water	02/05/15
7	MW-21-4	1503050-07	Water	02/05/15
8	MW-21-3	1503050-08	Water	02/05/15
9	MW-21-2	1503050-09	Water	02/05/15
10	MW-21-3MS	1503050-08MS	Water	02/05/15
11	MW-21-3MSD	1503050-08MSD	Water	02/05/15
12	#3 MS			
13	#3 MSD			

LDC #: 33857B1 **VALIDATION COMPLETENESS WORKSHEET** Date: 3/13/15

SDG #: 15-03050 Level III Page: 2 of 2

Laboratory: BC Laboratories, Inc. Reviewer: BV

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14				
15				
16				

Notes:

1	BYB1178-BLK1						
2	BYB1179-BLK1						

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Pentachloroethane
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. methyl iodide
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR. trans-1,4-Dichloro-
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS. 2-butene
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 33857B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: BR
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 an initial calibration verification standard analyzed after each ICAL for each instrument?
Y N N/A Were all %D within the validation criteria of ≤30 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	2/11/15	ICV-MSV5	PPPP	60.8	All	J/UJ/P (ND)

LDC #: 338578J

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: BK
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
	2/13/15	CCV-13FEB02	O	31.3	All	J/UJ/P (ND)
	2/13/15	CCV-13FEB03	RRRR	36.0	All	J/UJ/P (ND)
			PPPP	116		J

CONCAL.1S5

LDC #: 33857B1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: BR
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 Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		10/11	P	( )	132 (70-130)	( )	8	J detl/A (ND)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 25, 2015

Parameters: Chromium

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-03050

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-7-02/05/15	1503050-02	Water	02/05/15
MW-3-4	1503050-03	Water	02/05/15
MW-3-3	1503050-04	Water	02/05/15
MW-3-2	1503050-05	Water	02/05/15
MW-21-5	1503050-06	Water	02/05/15
MW-21-4	1503050-07	Water	02/05/15
MW-21-3	1503050-08	Water	02/05/15
MW-21-2	1503050-09	Water	02/05/15
MW-3-4MS	1503050-03MS	Water	02/05/15
MW-3-4MSD	1503050-03MSD	Water	02/05/15
MW-3-4DUP	1503050-03DUP	Water	02/05/15
MW-21-3MS	1503050-08MS	Water	02/05/15
MW-21-3MSD	1503050-08MSD	Water	02/05/15
MW-21-3DUP	1503050-08DUP	Water	02/05/15
MW-21-2MS	1503050-09MS	Water	02/05/15
MW-21-2MSD	1503050-09MSD	Water	02/05/15
MW-21-2DUP	1503050-09DUP	Water	02/05/15

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-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. 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(s).

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

IV. ICP Interference Check Sample (ICS) 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-7-02/05/15 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
EB-7-02/05/15	Chromium	0.54

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. ICP Serial Dilution

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

X. Laboratory Control Samples (LCS)

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

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

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, 1Q2015
Chromium - Data Qualification Summary - SDG 15-03050

No Sample Data Qualified in this SDG

NASA JPL, 1Q2015
Chromium - Laboratory Blank Data Qualification Summary - SDG 15-03050

No Sample Data Qualified in this SDG

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:35:49AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

EB-7-02/05/15

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-02
File ID: PE_EL2_150210-043
Sampled: 02/05/15 06:50
Prepared: 02/09/15 19:30
Analyzed: 02/10/15 12:33
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0732
Sequence: 1502185
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.54	1	J	EPA-200.8

3/26/15 8

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

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Project: JPL- GW Monitoring Wells
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Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-3-4

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-03
File ID: PE_EL2_150211-083
Sampled: 02/05/15 07:20
Prepared: 02/10/15 09:30
Analyzed: 02/11/15 15:55
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0877
Sequence: 1502302
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	76	1		EPA-200.8

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:35:49AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-3-3

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-04
File ID: PE_EL2_150210-045
Sampled: 02/05/15 08:10
Prepared: 02/09/15 19:30
Analyzed: 02/10/15 12:40
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0732
Sequence: 1502185
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

3/26/15 [illegible]

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:35:49AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-3-2

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-05
File ID: PE_EL2_150210-046
Sampled: 02/05/15 08:45
Prepared: 02/09/15 19:30
Analyzed: 02/10/15 12:43
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0732
Sequence: 1502185
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:35:49AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-21-5

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-06
File ID: PE_EL2_150210-047
Sampled: 02/05/15 10:20
Prepared: 02/09/15 19:30
Analyzed: 02/10/15 12:47
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0732
Sequence: 1502185
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	0.84	1	J	EPA-200.8

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:35:49AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-21-4

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-07
File ID: PE_EL2_150210-048
Sampled: 02/05/15 11:00
Prepared: 02/09/15 19:30
Analyzed: 02/10/15 12:50
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0732
Sequence: 1502185
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	EPA-200.8

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:35:49AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-21-3

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-08
File ID: PE_EL2_150211-286
Sampled: 02/05/15 11:35
Prepared: 02/11/15 09:00
Analyzed: 02/12/15 04:46
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0967
Sequence: 1502335
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:35:49AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-200.8

MW-21-2

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-09
File ID: PE_EL2_150210-032
Sampled: 02/05/15 12:50
Prepared: 02/09/15 19:30
Analyzed: 02/10/15 11:55
Solids: 0.00
Preparation: EPA 200.2
Initial/Final: 50 ml / 50 ml
Batch: BYB0732
Sequence: 1502185
Calibration: UNASSIGNED
Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.0	1	J	EPA-200.8

3/6/15

LDC #: 33857B4a

SDG #: 15-03050

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 3/17/15

Page: 1 of 2

Reviewer: JD

2nd Reviewer: OL

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	2/5/15
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) (12,13)(15,16)
VIII.	Duplicate sample analysis	A	DUP
IX.	ICP Serial Dilution	A	
X.	Laboratory control samples	A	LCS/D
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	Not Reviewed
XIII.	Sample Result Verification	N	
XIV.	Overall Assessment of Data	A	

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

	Client ID	Lab ID	Matrix	Date
1	EB-7-02/05/15	1503050-02	Water	02/05/15
2	MW-3-4	1503050-03	Water	02/05/15
3	MW-3-3	1503050-04	Water	02/05/15
4	MW-3-2	1503050-05	Water	02/05/15
5	MW-21-5	1503050-06	Water	02/05/15
6	MW-21-4	1503050-07	Water	02/05/15
7	MW-21-3	1503050-08	Water	02/05/15
8	MW-21-2	1503050-09	Water	02/05/15
9	MW-3-4MS	1503050-03MS	Water	02/05/15
10	MW-3-4MSD	1503050-03MSD	Water	02/05/15
11	MW-3-4DUP	1503050-03DUP	Water	02/05/15
12	MW-21-3MS	1503050-08MS	Water	02/05/15
13	MW-21-3MSD	1503050-08MSD	Water	02/05/15
14	MW-21-3DUP	1503050-08DUP	Water	02/05/15
15	MW-21-2MS	1503050-09MS	Water	02/05/15

LDC #: 33857B4a

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 3/19/15

SDG #: 15-03050

Page: 2 of 2

Laboratory: BC Laboratories, Inc.

Reviewer: JP

2nd Reviewer: a

METHOD: Chromium (EPA Method 200.8)

	Client ID	Lab ID	Matrix	Date
16	MW-21-2MSD	1503050-09MSD	Water	02/05/15
17	MW-21-2DUP	1503050-09DUP	Water	02/05/15
18				
19				
20				
21				
22				

Notes:

LDC #: 33857B4a

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

Analyte	Concentration Units (ug/L)
Cr	0.54

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

Analyte	Concentration Units ( )

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NASA JPL, 1Q2015

LDC Report Date: March 25, 2015

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: BC Laboratories, Inc.

Sample Delivery Group (SDG): 15-03050

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-7-02/05/15	1503050-02	Water	02/05/15
MW-3-4	1503050-03	Water	02/05/15
MW-3-3	1503050-04	Water	02/05/15
MW-3-2	1503050-05	Water	02/05/15
MW-21-5	1503050-06	Water	02/05/15
MW-21-4	1503050-07	Water	02/05/15
MW-21-3	1503050-08	Water	02/05/15
MW-21-2	1503050-09	Water	02/05/15
MW-3-4MS	1503050-03MS	Water	02/05/15
MW-3-4MSD	1503050-03MSD	Water	02/05/15
MW-3-4DUP	1503050-03DUP	Water	02/05/15
MW-21-3MS	1503050-08MS	Water	02/05/15
MW-21-3MSD	1503050-08MSD	Water	02/05/15
MW-21-3DUP	1503050-08DUP	Water	02/05/15

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 methods:

Hexavalent Chromium by 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 method(s). No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample EB-7-02/05/15 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 method. 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 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, 1Q2015
Wet Chemistry - Data Qualification Summary - SDG 15-03050

No Sample Data Qualified in this SDG

NASA JPL, 1Q2015
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 15-03050

No Sample Data Qualified in this SDG

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

EB-7-02/05/15

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-02
File ID: F022415.seq-46.0000.txt
Sampled: 02/05/15 06:50
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 11:28
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2171
Sequence: 1503064
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

3/6/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-3-4

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-03
File ID: F022415.seq-47.0000.txt
Sampled: 02/05/15 07:20
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 11:42
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2171
Sequence: 1503064
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-314.0

MW-3-3

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-04
File ID: F022415.seq-51.0000.txt
Sampled: 02/05/15 08:10
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 12:37
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2171
Sequence: 1503064
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

3/26/15 δ

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-3-2

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-05
File ID: F022415.seq-54.0000.txt
Sampled: 02/05/15 08:45
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 13:19
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2171
Sequence: 1503064
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	12	1		EPA-314.0

3/6/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-21-5

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-06
File ID: F022415.seq-55.0000.txt
Sampled: 02/05/15 10:20
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 13:33
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2171
Sequence: 1503064
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-21-4

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-07
File ID: F022415.seq-56.0000.txt
Sampled: 02/05/15 11:00
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 13:47
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2171
Sequence: 1503064
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-21-3

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-08
File ID: F022415.seq-57.0000.txt
Sampled: 02/05/15 11:35
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 14:00
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2171
Sequence: 1503064
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-314.0

MW-21-2

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-09
File ID: F022415.seq-58.0000.txt
Sampled: 02/05/15 12:50
Prepared: 02/24/15 01:00
Analyzed: 02/24/15 14:14
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB2171
Sequence: 1503064
Calibration: UNASSIGNED
Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.6	1	J	EPA-314.0

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

EB-7-02/05/15

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-02
File ID: 150205 1226 CR6-416
Sampled: 02/05/15 06:50
Prepared: 02/05/15 19:49
Analyzed: 02/05/15 19:49
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0715
Sequence: 1502187
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-3-4

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-03
File ID: 150205 1226 CR6-417
Sampled: 02/05/15 07:20
Prepared: 02/05/15 19:49
Analyzed: 02/05/15 19:49
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0715
Sequence: 1502187
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

3/26/15

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-3-3

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-04
File ID: 150205 1226 CR6-418
Sampled: 02/05/15 08:10
Prepared: 02/05/15 19:49
Analyzed: 02/05/15 19:49
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0715
Sequence: 1502187
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-3-2

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-05
File ID: 150205 1226 CR6-419
Sampled: 02/05/15 08:45
Prepared: 02/05/15 19:49
Analyzed: 02/05/15 19:49
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0715
Sequence: 1502187
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-21-5

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-06
File ID: 150205 1226 CR6-422
Sampled: 02/05/15 10:20
Prepared: 02/05/15 19:49
Analyzed: 02/05/15 19:53
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0715
Sequence: 1502187
Calibration: UNASSIGNED
Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00098	1	J	EPA-7196

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-21-4

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-07
File ID: 150205 1226 CR6-423
Sampled: 02/05/15 11:00
Prepared: 02/05/15 19:49
Analyzed: 02/05/15 19:53
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0715
Sequence: 1502187
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-21-3

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-08
File ID: 150205 1226 CR6-412
Sampled: 02/05/15 11:35
Prepared: 02/05/15 19:49
Analyzed: 02/05/15 19:49
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0715
Sequence: 1502187
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

3/26/15

Tidewater Inc.
3761 Attucks Drive
Powell, OH 43065

Reported: 3/3/2015 9:34:51AM
Project: JPL- GW Monitoring Wells
Project Number: 1Q15
Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET
EPA-7196

MW-21-2

Laboratory: BC Laboratories
SDG: 15-03050
Client: Tidewater Inc.
Project: JPL- GW Monitoring Wells
Matrix: Water
Laboratory ID: 1503050-09
File ID: 150205 1226 CR6-429
Sampled: 02/05/15 12:50
Prepared: 02/05/15 19:49
Analyzed: 02/05/15 21:23
Solids: 0.00
Preparation: No Prep
Initial/Final: 20 ml / 20 ml
Batch: BYB0715
Sequence: 1502187
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

LDC #: 33857B6

SDG #: 15-03050

Laboratory: BC Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 3/19/15

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Reviewer: SD

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	02/05/15
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)
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-7-02/05/15	1503050-02	Water	02/05/15
2	MW-3-4	1503050-03	Water	02/05/15
3	MW-3-3	1503050-04	Water	02/05/15
4	MW-3-2	1503050-05	Water	02/05/15
5	MW-21-5	1503050-06	Water	02/05/15
6	MW-21-4	1503050-07	Water	02/05/15
7	MW-21-3	1503050-08	Water	02/05/15
8	MW-21-2	1503050-09	Water	02/05/15
9	MW-3-4MS ClO_4	1503050-03MS	Water	02/05/15
10	MW-3-4MSD	1503050-03MSD	Water	02/05/15
11	MW-3-4DUP	1503050-03DUP	Water	02/05/15
12	MW-21-3MS CrO_4^{-2}	1503050-08MS	Water	02/05/15
13	MW-21-3MSD	1503050-08MSD	Water	02/05/15
14	MW-21-3DUP	1503050-08DUP	Water	02/05/15
15				
16				
17				

LDC #: 33057B4

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: JD
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Parameter
1-8	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: 9-11	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
QC: 12-14	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
	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
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	pH TDS Cl F NO_3 NO_2 SO_4 O-PO_4 Alk CN NH_3 TKN TOC Cr6+ ClO_4

Comments: