Reported: 8/25/2017 12:52:02PM
Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-26-2

Laboratory:

BC Laboratories

SDG:

17-20817

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

_

File ID:

02AUG49.D

Sampled:

water

Laboratory ID.

1720817-07 08/02/17 07:00

Analyzed:

08/03/17 04:02

Solids:

07/28/17 10:50

Prepared:
Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

1707017 Batch: B[H0012 1713601 Calibration: Instrument: MS-V5 Sequence: DILUTION CONC. (ug/L) CAS NO. COMPOUND Q 0.11 U 71-43-2 Benzene 1 1 0.15 U Bromobenzene 108-86-1 Bromochloromethane 0.27 U 74-97-5 1 1 U Bromodichloromethane 0.20 75-27-4 75-25-2 **Bromoform** 1 0.46 U U Bromomethane 0.20 74-83-9 n-Butylbenzene 1 0.15 U 104-51-8 U sec-Butylbenzene 0.13 135-98-8 1 0.18 U 98-06-6 tert-Butylbenzene Carbon tetrachloride 1 0.17 U 56-23-5 U Chlorobenzene 1 0.14 108-90-7 75-00-3 Chloroethane 1 0.17 U Chloroform 1 1.3 67-66-3 Chloromethane 1 0.11 U 74-87-3 1 0.14 U 2-Chlorotoluene 95-49-8 1 0.093 U 4-Chlorotoluene 106-43-4 Dibromochloromethane 1 0.22 U 124-48-1 U 1,2-Dibromo-3-chloropropane 1 0.89 96-12-8 1 106-93-4 1,2-Dibromoethane 0.22 U U Dibromomethane 0.23 74-95-3 1,2-Dichlorobenzene 0.21 U 95-50-1 1,3-Dichlorobenzene 1 0.16 U 541-73-1 1.4-Dichlorobenzene 1 0.15 U 106-46-7 Dichlorodifluoromethane 1 U 75-71-8 0.15 1.1-Dichloroethane 1 0.15 U 75-34-3 107-06-2 1.2-Dichloroethane 1 0.17 U 1 1,1-Dichloroethene 0.27 U 75-35-4 cis-1,2-Dichloroethene 1 0.27 U 156-59-2 trans-1,2-Dichloroethene 1 0.17 U 156-60-5 78-87-5 1,2-Dichloropropane 1 U 0.15 142-28-9 1,3-Dichloropropane 1 0.13 U U 594-20-7 2,2-Dichloropropane 0.18

56592117

Reported: 8/25/2017 12:52:02PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-26-2

Laboratory:

BC Laboratories

SDG:

17-20817

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720817-07

File ID:

02AUG49.D

Sampled:

07/28/17 10:50

Prepared:

08/02/17 07:00

Analyzed:

08/03/17 04:02

Solids:		Prep	aration:	EPA 50	30 Water MS	Initial/Final:	25 ml / 25 ml	
Batch:	B[H0012	Sequence:	<u>1713601</u>		Calibration:	<u>1707017</u>	Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND				DILUTION	СО	NC. (ug/L)	Q
563-58-6	1,1-Dichlorop	ropene			1	•	0.19	U
10061-01-5	cis-1,3-Dichlo	ropropene			1		0.14	U
10061-02-6	trans-1,3-Dich	loropropene			1		0.13	U
100-41-4	Ethylbenzene				1		0.15	U
87-68-3	Hexachlorobu	tadiene			1		0.20	U
98-82-8	Isopropylbenz	ene			1		0.14	U
99-87-6	p-Isopropyltol	uene			. 1	•	0.14	U
75-09-2	Methylene chl	oride			1		0.21	U
1634-04-4	Methyl t-butyl	ether			. 1		0.14	U
91-20-3	Naphthalene				1		0.16	U
103-65-1	n-Propylbenze	ne			1		0.12	U .
100-42-5	Styrene				1		0.12	· U
630-20-6	1,1,1,2-Tetrac	hloroethane			1		0.21	U
79-34-5	1,1,2,2-Tetrac	hloroethane			1 .		0.17	U
127-18-4	Tetrachloroeth	iene	-		1		1.8	
108-88-3	Toluene				1		0.17	U
87-61-6	1,2,3-Trichlore	obenzene			1		0.19	U
120-82-1	1,2,4-Trichlor	obenzene			1		0.15	U
71-55-6	1,1,1-Trichlor	oethane			1		0.21	U
79-00-5	1,1,2-Trichlor	oethane			1		0.21	U
79-01-6	Trichloroether	ne			1		0.28	J
75-69-4	Trichlorofluor	omethane			1		0.14	U
96-18-4	1,2,3-Trichlor	opropane			1		0.78	U
76-13-1	1,1,2-Trichlor	o-1,2,2-trifluoroetha	ane		1		0.19	U
95-63-6	1,2,4-Trimeth	ylbenzene			1		0.17	U
108-67-8	1,3,5-Trimethy	ylbenzene			1		0.14	U
75-01-4	Vinyl chloride	;			1		0.18	U
67-64-1	Acetone				1		6.6	U
107-13-1	Acrylonitrile				1		1.5	U
107-05-1	Allyl chloride				1		0.47	U
994-05-8	t-Amyl Methy	l ether			1		0.19	U
75-65-0	t-Butyl alcoho	1			1		9.4	U

Tidewater Inc.
3761 Attucks Drive

Reported: 8/25/2017 12:52:02PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-26-2

Laboratory:

Powell, OH 43065

BC Laboratories

SDG:

<u>17-20817</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720817-07

File ID:

02AUG49.D

Sampled:

07/28/17 10:50

Prepared:

08/02/17 07:00

Analyzed:

08/03/17 04:02

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

% REC

106

309776

25 ml / 25 ml

Batch:	<u>B[H0012</u> Sequence: <u>1713601</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	11	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	1	1.1	באיט
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	11	0.63	רון ט
107-12-0	Propionitrile	1	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.34	U
95-47-6	o-Xylene	1	0.13	U

Toluene-d8 (Surrogate)	10.000	9.7700	97.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6000	96.0	80 - 120	
INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	193818	6.57	204288	6.57	
Chlorobenzene-d5 (IS)	74170	9.61	82858	9.61	

CONC (ug/L)

10.580

7.38

ADDED (ug/L)

10.000

276070

1,4-Difluorobenzene (IS)

SYSTEM MONITORING COMPOUND

1,2-Dichloroethane-d4 (Surrogate)

SLOPAIT

QC LIMITS

75 - 125

7.38

Q

^{*} Values outside of QC limits



Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 12:52:02PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET

EPA-524.2

MW-26-2

Laboratory:

BC Laboratories

SDG:

17-20817

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720817-07

File ID:

02AUG49.D

Sampled:

07/28/17 10:50

Prepared:

08/02/17 07:00

Analyzed:

08/03/17 04:02

Solids:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

B[H0012

Preparation:

1713601

Calibration:

1707017

Batch:

Sequence:

MS-V5 Instrument:

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
107-14-2	Chloroacetonirile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichlord propanone	1		U
96-33-3	Methyl acrylate	1		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

^{*} Values outside of QC limits



Reported: 8/25/2017 12:52:02PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-26-1

Laboratory:

BC Laboratories

SDG:

17-20817

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720817-08

File ID:

02AUG50.D

Sampled:

07/28/17 11:10

Prepared:

08/02/17 07:00

Analyzed:

08/03/17 04:25

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0012</u> Sequence: <u>1713601</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	. 1	0.15	U
135-98-8	sec-Butylbenzene	. 1	0.13	. U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.29	J
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0,093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U.
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

Reported: 8/25/2017 12:52:02PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-26-1

Laboratory:

BC Laboratories

SDG:

<u>17-20817</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720817-08

File ID:

02AUG50.D

Sampled:

07/28/17 11:10

Prepared:

Preparation:

08/02/17 07:00

Analyzed:

08/03/17 04:25

Solids:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0012</u> Sequence: <u>1713601</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.70	
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.24	J
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/25/2017 12:52:02PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-26-1

Laboratory:

BC Laboratories

SDG:

17-20817

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Laboratory ID:

<u>1720817-08</u>

File ID:

02AUG50.D

Sampled:

<u>Water</u> 07/28/17 11:10

Prepared:

08/02/17 07:00

Analyzed:

08/03/17 04:25

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0012</u> Sequence: <u>1713601</u>	Calibration:	1707017 Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	· 1	0.33	Ū
97-63-2	Ethyl methacrylate	. 1	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	1	1.1	UU
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	1	0.63	UU
107-12-0	Propionitrile	1	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.34	U
95-47-6	o-Xylene	1	0.13	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	9.7700	97.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.200	102	80 - 120	

					
INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	183962	6.57	204288	6.57	
Chlorobenzene-d5 (IS)	71799	9.61	82858	9.61	·
1,4-Difluorobenzene (IS)	271114	7.38	309776	7.38	

^{*} Values outside of QC limits

Reported: 8/25/2017 12:52:02PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-26-1

Laboratory:

BC Laboratories

SDG:

17-20817

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720817-08

File ID:

02AUG50.D

Sampled:

07/28/17 11:10

Prepared:

08/02/17 07:00

Analyzed:

08/03/17 04:25

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0012</u> Sequence: <u>1713601</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
107-14-2	Chloroacetonitrile	. 1		Ŭ
109-69-3	1-Chlorobutane	1		Ū
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

^{*} Values outside of QC limits

Reported: 8/25/2017 12:52:02PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-5-072817

Laboratory:

BC Laboratories

SDG:

<u>17-20817</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720817-09

File ID:

02AUG51.D

Sampled:

07/28/17 11:25

Prepared:

08/02/17 07:00

Analyzed:

<u>08/03/17 04:48</u>

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0012</u> Sequence: <u>1713601</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	Ū
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	Ū
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

Reported: 8/25/2017 12:52:02PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-5-072817

Laboratory:

BC Laboratories

SDG:

17-20817

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720817-09

File ID:

02AUG51.D

Sampled:

07/28/17 11:25

Prepared:

08/02/17 07:00

Analyzed:

08/03/17 04:48

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

olids:	Prepara		EFA 30	30 Water MS	Initial/Final:	25 mi / 25 mi	
Batch:	B[H0012 Sequence:	<u>1713601</u>		Calibration:	1707017	Instrument:	MS-V5
CAS NO.	COMPOUND			FILUTION	CON	IC. (ug/L)	Q
563-58-6	1,1-Dichloropropene			1		0.19	U
10061-01-5	cis-1,3-Dichloropropene			1		0.14	U
10061-02-6	trans-1,3-Dichloropropene			1		0.13	U
100-41-4	Ethylbenzene			1		0.15	U
87-68-3	Hexachlorobutadiene			1		0.20	U
98-82-8	Isopropylbenzene			1		0.14	Ü
99-87-6	p-Isopropyltoluene			1		0.14	U
75-09-2	Methylene chloride		/	1		0.21	U
1634-04-4	Methyl t-butyl ether			1		0.14	U
91-20-3	Naphthalene			1		0.16	U
103-65-1	n-Propylbenzene ,			1		0.12	U
100-42-5	Styrene		7	1		0.12	U
630-20-6	1,1,1,2-Tetrachloroethane			1		0.21	U
79-34-5	1,1,2,2-Tetrachloroethane		!	1		0.17	U
127-18-4	Tetrachloroethene			1		0.23	U
108-88-3	Toluene]	1		0.17	U
87-61-6	1,2,3-Trichlorobenzene		1-	1		0.19	U
120-82-1	1,2,4-Trichlorobenzene			1		0.15	U
71-55-6	1,1,1-Trichloroethane			1		0.21	U
79-00-5	1,1,2-Trichloroethane			1		0.21	U
79-01-6	Trichloroethene			1		0.19	U
75-69-4	Trichlorofluoromethane			1		0.14	U
96-18-4	1,2,3-Trichloropropane			1		0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	: 7		1		0.19	U
95-63-6	1,2,4-Trimethylbenzene			1		0.17	U
108-67-8	1,3,5-Trimethylbenzene			1		0.14	U
75-01-4	Vinyl chloride			1		0.18	U
67-64-1	Acetone			1		6.6	U
107-13-1	Acrylonitrile			1		1.5	U
107-05-1	Allyl chloride	_		1		0.47	U
994-05-8	t-Amyl Methyl ether			1		0.19	U
75-65-0	t-Butyl alcohol			1		9.4	U

Reported: 8/25/2017 12:52:02PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-5-072817

Laboratory:

BC Laboratories

SDG:

17-20817

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID: <u>17</u>

<u>1720817-09</u> File ID:

02AUG51.D

Sampled:

07/28/17 11:25

Prepared:

08/02/17 07:00

Analyzed:

08/03/17 04:48

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0012</u> Sequence: <u>1713601</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	. 1	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	1	1.1	U V3
108-10-1	Methyl isobutyl ketone	1	2.4	· U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	1	0.63	U U7
107-12-0	Propionitrile	1	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	, U
179601-23-1	p- & m-Xylenes	1	0.34	U ·
95-47-6	o-Xylene	1	0.13	U
	<u> </u>			

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	11.340	113	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9600	99.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.230	102	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	183371	6.57	204288	6.57	
Chlorobenzene-d5 (IS)	73943	9.61	82858	9.61	
1,4-Difluorobenzene (IS)	276989	7.38	309776	7.38	

^{*} Values outside of QC limits

Reported: 8/25/2017 12:52:02PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-5-072817

Laboratory:

BC Laboratories

SDG:

17-20817

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

1720817-09

File ID:

02AUG51.D

Sampled:

Water 07/28/17 11:25

Prepared:

Laboratory ID:

08/02/17 07:00

Analyzed:

08/03/17 04:48

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0012 Sequence:	<u>1713601</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND		DILUTION	CONC. (ug/L)	Q
107-14-2	Chloroacetonitrile		1		Ū
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

^{*} Values outside of QC limits

DG#	:39385A1		LETE Level		ESS WOF	RKSHEET		Date: <u>¶/2</u> Page: <u>/</u> of Reviewer: <u></u>
1ETH	OD: GC/MS Volatiles (EPA Method 524.	2)					2nd	Reviewer:
	,	•	- 11		. Paladiana ana		- 6 :1:	
	amples listed below were reviewed for eation findings worksheets.	cn of the fo	Ollowin	g va	alidation are	eas. Validation	n findings are	noted in attache
	·	T	T					
	Validation Area		<u> </u>			Comme	ents	
I.	Sample receipt/Technical holding times	A						
II.	GC/MS Instrument performance check	A						
III.	Initial calibration/ICV	AIA	R	<u>5</u> 2	5 < 00	70. Y2	101=	= 30/0
IV.	Continuing calibration	w	~	=1	/ 1 2	20		
V.	Laboratory Blanks	A				<u> </u>	·	
VI.	Field blanks	NP	TE	5 =	/ . ~	£≥=8′		
VII.	Surrogate spikes	A						
VIII.	Matrix spike/Matrix spike duplicates	Ň	C=	→	,	/		
IX.	Laboratory control samples	A	10	9	•			
X.	Field duplicates	11/	70:	> :	3+5			
XI.	Internal standards	- 1						- ***
		- XI	 				_	
XII.	Compound quantitation RL/LOQ/LODs	N	<u> </u>					
XIII.	Target compound identification	N N						
XIV.	System performance	N						
XV.	Overall assessment of data	14						
ote:	N = Not provided/applicable R = Rin	o compound sate eld blank	s detect	ed	TB = 1	uplicate Trip blank Equipment blank	OTHER	ırce blank :
	Client ID				Lab ID		Matrix	Date
.	TB-5-072817				172081	17-01	Water	07/28/17
	MW-23-3				172081	17-03	Water	07/28/17
	MW-23-2				17208	17-04	Water	07/28/17
	MVV-23-1				172081	17-05	Water	07/28/17
	DUP#-3-3Q17				17208		Water	07/28/17
	MW-26-2				17208		Water	07/28/17
	MVV-26-1				17208		Water	07/28/17
	EB-5-072817				17208		Water	07/28/17
								1
n								
otes:								

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyi alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. lodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methylcyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

VALIDATION FINDINGS WORKSHEET Continuing Calibration

2nd Reviewer: 4

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/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: <u><</u> 30.0%)	Associated Samples	Qualifications
	8/1/17	61AU433	B	63.5	1,2,MB	VINA
		,	Methyl iodide 2222	62.9	(ND)	/ /
			2222	59.6	/	
	8/2/17	. * 1/ 2 0 -	8	10 /-		161.6
	0/4/1	024402	Methy radide	68.5 73.9	BA	YUZP
			Metul Icalae	/3. /		
	82/17	02AUS34	Methy Todiale	53.9	3-8	VINAP
	7		2222	35.3		
 						

LDC#:39385A/

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page: / of/ Reviewer: 4 2nd Reviewer: //

METHOD: GCMS VOA (EPA Method 524.2)

	Concentra		
Compound	3	5	RPD
К	0.84	0.89	6
1	0.30	0.31	3
AA	0.93	0.80	15
S	4.0	4.1	2

V:\FIELD DUPLICATES\Field Duplicates\FD_Organics\2017\39385A1_JPL.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 21, 2017

Parameters:

Chromium

Validation Level:

Level III

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-20817

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-23-4	1720817-02	Water	07/28/17
MW-23-3	1720817-03	Water	07/28/17
MW-23-2	1720817-04	Water	07/28/17
MW-23-1	1720817-05	Water	07/28/17
DUP-3-3Q17	1720817-06	Water	07/28/17
MW-26-2	1720817-07	Water	07/28/17
MW-26-1	1720817-08	Water	07/28/17
EB-5-072817	1720817-09	Water	07/28/17
MW-23-4MS	1720817-02MS	Water	07/28/17
MW-23-4MSD	1720817-02MSD	Water	07/28/17
MW-23-4DUP	1720817-02DUP	Water	07/28/17

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chromium by Environmental Protection Agency (EPA) Method 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

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

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

IV. ICP Interference Check Sample Analysis

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

V. Laboratory Blanks

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

VI. Field Blanks

Sample EB-5-072817 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration
EB-5-072817	Chromium	1.2 ug/L

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

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

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

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

XI. Field Duplicates

Samples MW-23-2 and DUP-3-3Q17 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concent	-	
Analyte	MW-23-2	DUP-3-3Q17	RPD
Chromium	2.2	2.2	0

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, 3Q2017 Chromium - Data Qualification Summary - SDG 17-20817

No Sample Data Qualified in this SDG

NASA JPL, 3Q2017 Chromium - Laboratory Blank Data Qualification Summary - SDG 17-20817

No Sample Data Qualified in this SDG

Reported: 8/25/2017 2:24:31PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-23-4

Laboratory: BC Laboratories

SDG: <u>17-20817</u>

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1720817-02</u>

File ID: PE-EL3 170803R-111

07/28/17 07:25 Sampled:

Prepared: 08/03/17 08:30

Analyzed: 08/03/17 23:13

Solids: 0.00 Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0270</u>

Sequence: 1713864 Calibration: UNASSIGNED

Instrument: PE-EL3

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.7	1		EPA-200.8

1092117

Reported: 8/25/2017 2:24:31PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-23-3

Laboratory: BC Laboratories

SDG: 17-20817

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720817-03</u>

File ID: PE-EL3 170803R-121

Sampled: 07/28/17 07:50

Prepared: 08/03/17 08:30

Analyzed: 08/03/17 23:47

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: B[H0270

1713864

Sequence:

Calibration: UNASSIGNED

Instrument: PE-EL3

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.8	1		EPA-200.8

1092117

Reported: 8/25/2017 2:24:31PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-23-2

Laboratory: BC Laboratories

SDG: 17-20817

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720817-04</u>

File ID: PE-EL3 170803R-122

Sampled: 07/28/17 08:25

Prepared: 08/03/17 08:30

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Analyzed: 08/03/17 23:50

Batch: <u>B[H0270</u>

Sequence:

1713864

Calibration: <u>UNASSIGNED</u>

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

Tidewater Inc.

3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 2:24:31PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-23-1

Laboratory: BC Laboratories

SDG: 17-20817

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water Laboratory ID: <u>1720817-05</u>

File ID: PE-EL3 170803R-123

Sampled: 07/28/17 09:10

08/03/17 08:30 Prepared:

Analyzed: 08/03/17 23:54

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0270</u>

Sequence:

1713864

Calibration: <u>UNASSIGNED</u>

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

Tidewater Inc.

3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 2:24:31PM

Project: JPL-GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-200.8**

DUP-3-3Q17

Laboratory: BC Laboratories

SDG: 17-20817

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1720817-06</u>

File ID: PE-EL3 170803R-124

Sampled: 07/28/17 08:35

Prepared: 08/03/17 08:30

Analyzed: 08/03/17 23:57

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0270</u>

1713864 Sequence:

Calibration: <u>UNASSIGNED</u>

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

Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 2:24:31PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-200.8**

MW-26-2

Laboratory: BC Laboratories

SDG: 17-20817

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720817-07</u>

File ID: PE-EL3 170803R-125

Sampled: 07/28/17 10:50

Prepared: 08/03/17 08:30

Analyzed: 08/04/17 00:01

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: B[H0270

1713864 Sequence:

Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.0	1		EPA-200.8

Reported: 8/25/2017 2:24:31PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-26-1

Laboratory: BC Laboratories

SDG: 17-20817

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720817-08</u>

File ID: PE-EL3 170803R-126

Sampled: 07/28/17 11:10

Prepared: 08/03/17 08:30

Analyzed: 08/04/17 00:04

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0270</u>

<u>1713864</u>

Sequence:

Calibration: UNASSIGNED

Instrument: PE-EL3

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

& 109×117

Sequence:

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 2:24:31PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

EB-5-072817

Laboratory: BC Laboratories

SDG: 17-20817

Calibration: UNASSIGNED

Client: Tidewater Inc. Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: 1720817-09

File ID: PE-EL3 170803R-127

Sampled: <u>07/28/17 11:25</u>

Batch: B[H0270

Prepared: <u>08/03/17 08:30</u>

Analyzed: <u>08/04/17 00:08</u>

Solids: <u>0.00</u>

Preparation: EPA 200.2

1713864

Initial/Final: 50 ml / 50 ml

Instrument: PE-EL3

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.2	1	J	EPA-200.8

8092117

VALIDATION COMPLETENESS WORKSHEET LDC #: 39385A4a SDG #: 17-20817

Level III

Date: 9118117 Page: __ of _ \ Reviewer: 2nd Reviewer:

Laboratory: BC Laboratories, Inc.

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
1.	Sample receipt/Technical holding times	A /A	
II.	ICP/MS Tune	A	
111.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	2	Not tequired
V.	Laboratory Blanks	A	U
VI.	Field Blanks	sw	EB= 8
VII.	Matrix Spike/Matrix Spike Duplicates	A	
VIII.	Duplicate sample analysis	A-	
IX.	Serial Dilution	N	Not performed
X.	Laboratory control samples	A-	Les '
XI.	Field Duplicates	SW	(3,5)
XII.	Internal Standard (ICP-MS)	7	Not Reviewed for level 111
XIII.	Sample Result Verification	N	
ΧIV	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-23-4	1720817-02	Water	07/28/17
2	MW-23-3	1720817-03	Water	07/28/17
3	MW-23-2	1720817-04	Water	07/28/17
4	MW-23-1	1720817-05	Water	07/28/17
5	DUPF-3-3Q17	1720817-06	Water	07/28/17
6	MW-26-2	1720817-07	Water	07/28/17
7	MW-26-1	1720817-08	Water	07/28/17
8	EB-5-072817	1720817-09	Water	07/28/17
9	MVV-23-4MS	1720817-02MS	Water	07/28/17
10_	MW-23-4MSD	1720817-02MSD	Water	07/28/17
11	MW-23-4DUP	1720817-02DUP	Water	07/28/17
12				
13				
14				

Notes:

LDC #:_	-	
SDG #:		

VALIDATION FINDINGS WORKSHEET Field Blanks

Page:_	<u> 4</u>	of_	1
Reviewer:	V	16	
2nd reviewer:		3	<

METHOD: TI	race Metals (EPA CLP SOW ILM02.1)	
Y N N/A Y N N/A	Were field blanks identified in this SDG? Were target analytes detected in the field blanks?	
? Sample:	8 Field Blank / Trip Blank / Rinsate / Other <u>E</u> B (circle on	ne)
	Analyte	Concentration Units (سا 4)
×	Сг	1.2
-		
Sample:	Field Blank / Trip Blank / Rinsate / Other (circle of	one)
Sample:	Field Blank / Trip Blank / Rinsate / Other(circle of the state o	one) Concentration Units ()
Sample:	· ·	Concentration
Sample:	Analyte	Concentration
Sample:	Analyte	Concentration
Sample:	Analyte	Concentration
	Analyte	Concentration

LDC#: 39385A4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:_ <u>/</u>	_ot
Reviewer:	B
2nd Reviewer:	KK

METHOD: Metals (EPA Method 200.8)

	Concentration (ug/L)			
Analyte	3	5	RPD	
Chromium	2.2	2.2	0	

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2017\39385A4a.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 21, 2017

Parameters:

Wet Chemistry

Validation Level:

Level III

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-20817

Sample Identification	Laboratory Sample tion Identification Matri		Collection Date
MW-23-4	1720817-02	Water	07/28/17
MW-23-3	1720817-03	Water	07/28/17
MW-23-2	1720817-04	Water	07/28/17
MW-23-1	1720817-05	Water	07/28/17
DUP-3-3Q17	1720817-06	Water	07/28/17
MW-26-2	1720817-07	Water	07/28/17
MW-26-1	1720817-08	Water	07/28/17
EB-5-072817	1720817-09	Water	07/28/17
MW-23-4MS	1720817-02MS	Water	07/28/17
MW-23-4MSD	1720817-02MSD	Water	07/28/17
MW-23-4DUP	1720817-02DUP	Water	07/28/17

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

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

Perchlorate by EPA Method 314.0

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

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

III. Continuing Calibration

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

IV. Laboratory Blanks

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

V. Field Blanks

Sample EB-5-072817 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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

Samples MW-23-2 and DUPE-3-3Q17 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentration (mg/L)		
Analyte	MW-23-2	DUP-3-3Q17	RPD
Perchlorate	3.9 ug/L	4.7 ug/L	19
Hexavalent Chromium	0.0011 mg/L	0.00099 mg/L	11

X. Sample Result Verification

Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

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

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

NASA JPL, 3Q2017 Wet Chemistry - Data Qualification Summary - SDG 17-20817

No Sample Data Qualified in this SDG

NASA JPL, 3Q2017 Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 17-20817

No Sample Data Qualified in this SDG

Reported: 8/25/2017 12:54:01PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-23-3

Laboratory: BC Laboratories

SDG: 17-20817

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1720817-03</u>

File ID: F080917.seq-8.0000.txt

Sampled: 07/28/17 07:50

Prepared: 08/09/17 12:00

Analyzed: 08/09/17 22:23

Solids: 0.00 Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0982

Sequence: 1714391 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

16292117

Reported: 8/25/2017 12:54:01PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-23-2

Laboratory: BC Laboratories

SDG: 17-20817

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720817-04RE1</u>

File ID: <u>F080917.seq-10.0000.txt</u>

Sampled: 07/28/17 08:25

Prepared: 08/09/17 12:00

Analyzed: 08/09/17 22:50

Solids:

0.00

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0982</u>

Sequence:

1714391

Calibration: UNASSIGNED

Instrument: IC6

	CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
ſ	14797-73-0	Perchlorate	3.9	1	J	EPA-314.0

Reported: 8/25/2017 12:54:01PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-23-1

Laboratory: BC Laboratories

SDG: <u>17-20817</u>

Client: Tid

Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID: <u>1720817-05</u>

File ID: <u>F080917.seq-57.0000.txt</u>

Sampled:

07/28/17 09:10

Prepared: <u>08/09/17 12:00</u>

Analyzed: 08/10/17 10:36

Solids:

<u>0.00</u> Preparation: <u>No Prep</u>

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0982</u>

Sequence: <u>1714391</u>

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

Reported: 8/25/2017 12:54:01PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

DUP-3-3Q17

Laboratory: BC Laboratories

SDG: 17-20817

Client:

Tidewater Inc.

Matrix: Water

Laboratory ID: <u>1720817-06</u>

Project: JPL-GW Monitoring Wells

Sampled: 07/28/17 08:35

File ID: F080917.seq-59.0000.txt

Prepared: Preparation: No Prep

08/09/17 12:00

Analyzed: 08/10/17 11:03

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0982</u>

Solids: <u>0.00</u>

Sequence:

1714391

Calibration: <u>UNASSIGNED</u>

Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.7	1		EPA-314.0

8092417

Reported: 8/25/2017 12:54:01PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-26-2

Laboratory: BC Laboratories

SDG: 17-20817

Client: Tidewater Inc. Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1720817-07</u>

File ID: F080917.seq-60.0000.txt

Sampled: 07/28/17 10:50

Prepared: 08/09/17 12:00

Analyzed: 08/10/17 11:17

Solids: 0.00 Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0982</u>

Sequence:

1714391

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

Reported: 8/25/2017 12:54:01PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-26-1

Laboratory: BC Laboratories

SDG: 17-20817

Client: Tidewater Inc. Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1720817-08</u>

File ID: F080917.seq-62.0000.txt

Sampled: 07/28/17 11:10

Prepared: 08/09/17 12:00

Analyzed: 08/10/17 11:45

Solids: 0.00 Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0982

1714391 Sequence:

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

Reported: 8/25/2017 12:54:01PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

EB-5-072817

Laboratory: BC Laboratories

SDG: <u>17-20817</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720817-09</u>

File ID: <u>F080917.seq-64.0000.txt</u>

Sampled: 07/28/17 11:25

Prepared: 08/09/17 12:00

Analyzed: 08/10/17 12:13

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0982</u>

Sequence: <u>1714391</u>

Calibration: UNASSIGNED

Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0

X092117

Tidewater Inc.
3761 Attucks Drive

Powell, OH 43065

Reported: 8/25/2017 12:54:01PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-23-4

Laboratory: BC Laboratories

SDG: <u>17-20817</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720817-02</u>

File ID: 170728 1728 CR6-017

Sampled: 07/28/17 07:25

Prepared: 07/28/17 17:28

Analyzed: 07/28/17 18:25

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[G2617

Sequence: <u>1713607</u>

Calibration: UNASSIGNED

Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0031	1		EPA-7196

£09>117

Environmental Testing Laborator

Reported: 8/25/2017 12:54:01PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-23-3

Laboratory: BC Laboratories

SDG: <u>17-20817</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720817-03</u>

File ID: 170728 1728 CR6-025

Sampled: <u>07/28/17 07:50</u>

Tidewater Inc.

3761 Attucks Drive Powell, OH 43065

Prepared: 07/28/17 17:28

Analyzed: 07/28/17 18:39

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[G2617

Sequence: <u>1713607</u>

Calibration: UNASSIGNED

Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0029	1	·	EPA-7196

K29>117

Reported: 8/25/2017 12:54:01PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-23-2

Laboratory: BC Laboratories

SDG: <u>17-20817</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: 1720817-04

Toject. 51 E- G W Monitoring Wens

Sampled: <u>07/28/17 08:25</u>

Prepared: 07/28/17 17:28

File ID: <u>170728 1728 CR6-044</u>

Solids: <u>0.00</u>

Preparation: No Prep

Analyzed: <u>07/28/17 19:12</u> Initial/Final: <u>20 ml / 20 ml</u>

Batch: B[G2617

Sequence:

1713607

Calibration: <u>UNASSIGNED</u>

Instrument: KONE-1

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

Ex9217

Reported: 8/25/2017 12:54:01PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-23-1

Laboratory: BC Laboratories

SDG: <u>17-20817</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720817-05</u>

File ID: 170728 1728 CR6-027

Sampled: 07/28/17 09:10

Prepared: 07/28/17 17:28

Analyzed: 07/28/17 18:39

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[G2617

Sequence: <u>1713607</u>

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

2092117

Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 12:54:01PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

DUP-3-3Q17

Laboratory: BC Laboratories

SDG: 17-20817

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: 1720817-06

File ID: 170728 1728 CR6-028

Sampled: 07/28/17 08:35

Prepared: 07/28/17 17:28

Analyzed: 07/28/17 18:39

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[G2617</u>

Sequence:

1713607

Calibration: <u>UNASSIGNED</u>

Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00099	1	J	EPA-7196

Reported: 8/25/2017 12:54:01PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-7196**

MW-26-2

Laboratory: BC Laboratories

SDG: 17-20817

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720817-07</u>

File ID: 170728 1728 CR6-029

Sampled: 07/28/17 10:50

07/28/17 17:28 Prepared:

Analyzed: 07/28/17 18:39

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[G2617

1713607 Sequence:

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

DO9717

Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 12:54:01PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-7196**

MW-26-1

Laboratory: BC Laboratories

SDG: 17-20817

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720817-08</u>

File ID: 170728 1728 CR6-030

Sampled: 07/28/17 11:10

07/28/17 17:28 Prepared:

Analyzed: 07/28/17 18:39

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[G2617

1713607 Sequence:

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

_MJ

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065 Reported: 8/25/2017 12:54:01PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

EB-5-072817

Laboratory: BC Laboratories

SDG: <u>17-20817</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720817-09</u>

File ID: 170728 1728 CR6-031

Sampled: 07/28/17 11:25

Prepared: 07/28/17 17:28

Analyzed: 07/28/17 18:39

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[G2617

Sequence:

1713607

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

56092117

VALIDATION COMPLETENESS WORKSHEET

Level III

Page: \(\frac{9}{16}\) of \(\frac{1}{2}\)
Reviewer: \(\frac{1}{2}\)
2nd Reviewer: \(\frac{1}{2}\)

SDG #: 17-20817 Laboratory: BC Laboratories, Inc.

LDC #: 39385A6

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
l.	Sample receipt/Technical holding times	AIA	
ll.	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	EB-8
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	(3,5)
Χ.	Sample result verification	N	
ΧI	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-23-4	1720817-02	Water	07/28/17
2	MW-23-3	1720817-03	Water	07/28/17
3	MW-23-2	1720817-04	Water	07/28/17
4	MW-23-1	1720817-05	Water	07/28/17
5	DUPP-3-3Q17	1720817-06	Water	07/28/17
6	MW-26-2	1720817-07	Water	07/28/17
7	MW-26-1	1720817-08	Water	07/28/17
8	EB-5-072817	1720817-09	Water	07/28/17
9	MW-23-4MS	1720817-02MS	Water	07/28/17
10	MW-23-4M\$D	1720817-02MSD	Water	07/28/17
11	MW-23-4DUP	1720817-02DUP	Water	07/28/17
12				
13				
14				
15				
16				

Notes:

DC #: 39385A-4

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:1_of1	
Reviewer:JB	
2nd reviewer: _ k	

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+) CIO ₄
2-8	pH TDS CLF NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ (ClO ₄)
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
00	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
9-11	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC (Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	ph TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	ph TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
·	ph TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CLF NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CLF NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CLF NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CLE NO. NO. SO. O-PO. Alk CN NH. TKN TOC Cr6+ ClO.

Comments:		
		

LDC#: 39385A6

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page:_	/_of_/
Reviewer:_	<u> 13</u>
2nd Reviewer:	Kk_

Inorganics, Method See Cover

	Conce	entration		
Analyte	3	5	RPD	
Perchlorate (ug/L)	3.9	4.7	19	
Hexavalent Chromium (mg/L)	0.0011	0.00099	11	

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2017\39385A6.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 21, 2017

Parameters:

Volatiles

Validation Level:

Level III & IV

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-20934

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
TB-6-073117	1720934-01	Water	07/31/17
MW-4-3	1720934-02	Water	07/31/17
MW-4-2	1720934-03	Water	07/31/17
MW-4-1	1720934-04	Water	07/31/17
MW-21-5	1720934-05	Water	07/31/17
MW-21-4	1720934-06	Water	07/31/17
MW-21-3	1720934-07	Water	07/31/17
MW-21-2**	1720934-08**	Water	07/31/17
MW-21-1	1720934-09	Water	07/31/17
EB-6-073117	1720934-10	Water	07/31/17
SB-2-073117	1720934-11	Water	07/31/17
MW-21-3MS	1720934-07MS	Water	07/31/17
MW-21-3MSD	1720934-07MSD	Water	07/31/17

^{**}Indicates sample underwent Level IV review

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV evaluation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r²) were greater than or equal to 0.990.

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/03/17	Bromomethane Methyl iodide Pentachloroethane	50.5 (≤30) 61.7 (≤30) 35.5 (≤30)	TB-6-073117 MW-4-3 MW-4-2 MW-4-1 MW-21-5 MW-21-4 MW-21-3 MW-21-1 EB-6-073117 SB-2-073117	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P
08/04/17	Methyl iodide Pentachloroethane	51.8 (≤30) 33.9 (≤30)	MW-21-2**	UJ (all non-detects) UJ (all non-detects)	Р

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-6-073117 was identified as a trip blank. No contaminants were found.

Sample EB-6-073117 was identified as an equipment blank. No contaminants were found.

Sample SB-2-073117 was identified as a source blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

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

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

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

Due to continuing calibration %D, data were qualified as estimated in ten samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (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, 3Q2017 Volatiles - Data Qualification Summary - SDG 17-20934

Sample	Compound	Flag	A or P	Reason
TB-6-073117 MW-4-3 MW-4-2 MW-4-1 MW-21-5 MW-21-4 MW-21-3 MW-21-1 EB-6-073117 SB-2-073117	Bromomethane Methyl iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	Р	Continuing calibration (%D)
MW-21-2**	Methyl iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects)	P	Continuing calibration (%D)

NASA JPL, 3Q2017

Volatiles - Laboratory Blank Data Qualification Summary - SDG 17-20934

No Sample Data Qualified in this SDG

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-6-073117

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-01

File ID:

03AUG17.D

Sampled:

07/31/17 07:00

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 15:37

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	·U
75-27-4	Bromodichloromethane	1.	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	ע עס
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U ·
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U



Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-6-073117

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-01

File ID:

03AUG17.D

Sampled:

07/31/17 07:00

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 15:37

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Sonas.	riopatation. <u>22.2.2.</u>		imital inat.	
Batch:	B[H0282 Sequence: 1713705	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	11	0.14	. U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1 .	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	- U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	. U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U
				

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-6-073117

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-01

File ID:

03AUG17.D

Sampled:

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 15:37

Solids:

07/31/17 07:00

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	Ŭ
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	. 1	5.0	U
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	1	1.1	ע עז
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	1	0.63	U UJ
107-12-0	Propionitrile	1	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.34	U.
C				

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.580	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8400	98.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6800	96.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	200504	6.57	200979	6.57	
Chlorobenzene-d5 (IS)	76910	9.62	63715	9.61	
1,4-Difluorobenzene (IS)	282629	7.38	300872	7.38	

^{*} Values outside of QC limits

95-47-6

o-Xylene

U

0.13

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-6-073117

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

File ID:

03AUG17.D

Sampled:

07/31/17 07:00

Prepared:

1720934-01 08/03/17 07:00

Analyzed:

08/03/17 15:37

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0282	Sequence:	<u>1713705</u>	Calibration:	<u>1707017</u>	Instrument:	MS-V5
CAS NO.	COMPOUND			DILUTION	CC	ONC. (ug/L)	Q
107-14-2	Chloroacetonit	rile		. 1			U
109-69-3	1-Chlorobutane	e		1			Ū
513-88-2	1,1-Dichloropr	opanone		1 ·			U
96-33-3	Methyl acrylate	е		1			U
98-95-3	Nitrobenzene			1			U
79-46-9	2-Nitropropane)		1			U

^{*} Values outside of QC limits

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-4-3

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-02

File ID:

03AUG18.D

Sampled:

07/31/17 07:35

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 16:00

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	B[H0282 Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	TN U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1 .	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U.
74-95-3	Dibromomethane	1 .	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

869717

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-4-3

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-02

File ID:

03AUG18.D

Sampled:

07/31/17 07:35

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 16:00

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0282 Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5	
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	
563-58-6	1,1-Dichloropropene	1	0.19	U	
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U	
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U	
100-41-4	Ethylbenzene	1	0.15	U	
87-68-3	Hexachlorobutadiene	1	0.20	U	
98-82-8	Isopropylbenzene	1	0.14	U	
99-87-6	p-Isopropyltoluene	1	0.14	U	
75-09-2	Methylene chloride	1	0.21	U	
1634-04-4	Methyl t-butyl ether	1	0.14	U	
91-20-3	Naphthalene	1	0.16	U	
103-65-1	n-Propylbenzene	1	0.12	U	
100-42-5	Styrene	1	1 0.12		
630-20-6	1,1,1,2-Tetrachloroethane	1 0.21			
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U	
127-18-4	Tetrachloroethene	1	0.23	U	
108-88-3	Toluene	1	0.17	U	
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U	
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U	
71-55-6	1,1,1-Trichloroethane	1	0.21	Ŭ	
79-00-5	1,1,2-Trichloroethane	1	0.21	U	
79-01-6	Trichloroethene	1	0.70		
75-69-4	Trichlorofluoromethane	1	0.14	U	
96-18-4	1,2,3-Trichloropropane	1	0.78	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U	
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U	
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U	
75-01-4	Vinyl chloride	1	0.18	U	
67-64-1	Acetone	1	6.6	U	
107-13-1	Acrylonitrile	1	1.5	U	
107-05-1	Allyl chloride	1	0.47	Ū ·	
994-05-8	t-Amyl Methyl ether	1	0.19	U	
75-65-0	t-Butyl alcohol	1	9.4	U	

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-4-3

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

1 ide water 11

Water

Laboratory ID: 1

1720934-02

File ID:

03AUG18.D

Sampled:

07/31/17 07:35

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 16:00

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5	
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	
75-15-0	Carbon disulfide	1	0.48	U	
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U	
60-29-7	Diethyl ether	1	0.33	U	
97-63-2	Ethyl methacrylate	1	1.3	U	
637-92-3	Ethyl t-butyl ether	1	0.32	U	
67-72-1	Hexachloroethane	1	0.11	U	
591-78-6	2-Hexanone	1	5.0	U	
126-98-7	Methacrylonitrile	1	2.3	U	
78-93-3	Methyl ethyl ketone	1	3.3	U	
74-88-4	Methyl iodide	1	1.1	ע ען	
108-10-1	Methyl isobutyl ketone	1	2.4	U	
80-62-6	Methyl methacrylate	1	1.2	U	
76-01-7	Pentachloroethane	1	0.63	UU	
107-12-0	Propionitrile	1	6.2	U	
109-99-9	Tetrahydrofuran	1	5.2	U	
179601-23-1	p- & m-Xylenes	1	0.34	U	
95-47-6	o-Xylene	1	0.13	U	

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	11.180	112	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6500	96.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.4600	94.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	193902	6.57	200979	6.57	
Chlorobenzene-d5 (IS)	78487	9.62	63715	9.61	
1,4-Difluorobenzene (IS)	286480	7.38	300872	7.38	

^{*} Values outside of QC limits



Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-4-3

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-02

File ID:

03AUG18.D

Sampled:

07/31/17 07:35

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 16:00

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	,Q
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		Ū
79-46-9	2-Nitropropane	1		U

^{*} Values outside of QC limits



Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-4-2

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-03

File ID:

03AUG19.D

Sampled:

07/31/17 08:05

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 16:23

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	. 1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	UNI
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.37	J
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	· U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0,15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-4-2

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-03

File ID:

03AUG19.D

Sampled:

07/31/17 08:05

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 16:23

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Sulus.	r reparation.	3030 Water 1915	ilitial/I iliai. <u>25 ilii / 25 ilii</u>	
Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	Ú
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	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	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	1.3	
75-69-4	Trichlorofluoromethane	11	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	Ū
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1 .	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET **EPA-524.2**

MW-4-2

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-03

File ID:

03AUG19.D

Sampled:

07/31/17 08:05

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 16:23

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	U
67-72-1	Hexachloroethane	_ 1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	1	1.1	UUT
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	Ū
76-01-7	Pentachloroethane	1	0.63	Ub
107-12-0	Propionitrile	1	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.34	Ū
95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	11.310	113	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7000	97.0	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6400	96.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191181	6.57	200979	6.57	
Chlorobenzene-d5 (IS)	76438	9.62	63715	9.61	
1,4-Difluorobenzene (IS)	283280	7.38	300872	7.38	

^{*} Values outside of QC limits



Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-4-2

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-03

File ID:

03AUG19.D

Sampled:

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 16:23

07/31/17 08:05

25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
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

^{*} Values outside of QC limits



Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET **EPA-524.2**

MW-4-1

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-04

File ID:

03AUG20.D

Sampled:

07/31/17 08:30

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 16:46

Solids:		Pre	paration:	EPA 50	30 Water MS	Initial/Final:	25 ml / 25 ml	
Batch:	B[H0282	Sequence:	<u>1713705</u>		Calibration:	<u>1707017</u>	Instrument:	MS-V5
CAS NO.	COMPOUND				DILUTION	CO	VC. (ug/L)	Q
71-43-2	Benzene				1		0.11	U
108-86-1	Bromobenzene	;			1		0.15	Ŭ
74-97-5	Bromochlorom	ethane	**		1		0.27	U
75-27-4	Bromodichloro	methane			1		0.20	Ŭ
75-25-2	Bromoform				1		0.46	U
74-83-9	Bromomethane	•			1		0.20	U 1/2
104-51-8	n-Butylbenzen	е			1		0.15	U
135-98-8	sec-Butylbenze	ene			1		0.13	U
98-06-6	tert-Butylbenze	ene			1		0.18	U
56-23-5	Carbon tetrach	loride			1		0.17	U
108-90-7	Chlorobenzene	;			1		0.14	U
75-00-3	Chloroethane				1		0.17	U
67-66-3	Chloroform				1		0.14	U
74-87-3	Chloromethane	;			1		0.11	U
95-49-8	2-Chlorotoluen	ie			1		0.14	U
106-43-4	4-Chlorotoluen	ie			1		0.093	U
124-48-1	Dibromochloro	methane			1		0.22	U
96-12-8	1,2-Dibromo-3	-chloropropane			1		0.89	U
106-93-4	1,2-Dibromoet	hane			1		0.22	U
74-95-3	Dibromometha	ine			1		0.23	U
95-50-1	1,2-Dichlorobe	enzene			1		0.21	U
541-73-1	1,3-Dichlorobe	enzene			1		0.16	U
106-46-7	1,4-Dichlorobe	enzene			1		0.15	U
75-71-8	Dichlorodifluo	romethane			1		0.15	U
75-34-3	1,1-Dichloroet	hane			1		0.15	U
107-06-2	1,2-Dichloroet	hane			1		0.17	U
75-35-4	1,1-Dichloroet	hene			1		0.27	U
156-59-2	cis-1,2-Dichlor	roethene			1		0.27	U
156-60-5	trans-1,2-Dichl	loroethene			1		0.17	U
78-87-5	1,2-Dichloropr	opane			1		0.15	U
142-28-9	1,3-Dichloropr	opane			1		0.13	U
594-20-7	2,2-Dichloropr	opane			1		0.18	U

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Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-4-1

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-04

File ID:

03AUG20.D

Sampled:

07/31/17 08:30

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 16:46

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	11	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	Ŭ
75-69-4	Trichlorofluoromethane	11	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	Ū
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	Ū

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-4-1

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

07/31/17 08:30

JPL-GW Monitoring Wells

Matrix:

Laboratory ID:

Project:

File ID:

03AUG20.D

Sampled:

Water

Prepared:

1720934-04 08/03/17 07:00

Analyzed:

08/03/17 16:46

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0282	Sequence:	<u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND			DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfic	de		1	0.48	U
110-57-6	trans-1,4-Dich	loro-2-butene		1	1.8	U
60-29-7	Diethyl ether			1	0.33	U
97-63-2	Ethyl methacry	ylate		1	1.3	U
637-92-3	Ethyl t-butyl et	ther		1	0.32	U
67-72-1	Hexachloroethane			1	0.11	Ū
591-78-6	2-Hexanone		1	5.0	U	
126-98-7	Methacrylonitr	rile		1	2.3	U
78-93-3	Methyl ethyl k	etone		1	3.3	U
74-88-4	Methyl iodide			. 1	1.1	UU
108-10-1	Methyl isobuty	yl ketone		1	2.4	U
80-62-6	Methyl methac	crylate		1	1.2	U
76-01-7	Pentachloroeth	nane		1	0.63	LN n
107-12-0	Propionitrile			1	6.2	U
109-99-9	Tetrahydrofura	an		1	5.2	U
179601-23-1	p- & m-Xylene	es _		1	0.34	U
95-47-6	o-Xylene			1	0.13	บ

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	9.5900	95.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7700	97.7	80 - 120	

INTERNAL STANDARD	AREA	ŖТ	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	165465	6.57	200979	6.57	
Chlorobenzene-d5 (IS)	68152	9.61	63715	9.61	
1,4-Difluorobenzene (IS)	245587	7.38	300872	7.38	

^{*} Values outside of QC limits



Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-4-1

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-04

File ID:

03AUG20.D

Sampled:

07/31/17 08:30

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 16:46

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q .
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	11		U

^{*} Values outside of QC limits

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-5

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

1720934-05

File ID:

03AUG21.D

Sampled:

Water 07/31/17 10:15 Laboratory ID: Prepared:

08/03/17 07:00

Analyzed:

08/03/17 17:09

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	UU
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	5.9	
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	11	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	Ŭ
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-5

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-05

File ID:

03AUG21.D

Sampled:

07/31/17 10:15

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 17:09

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1</u>	71370 <u>5</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND		DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene		1	0.19	U
10061-01-5	cis-1,3-Dichloropropene		1	0.14	U
10061-02-6	trans-1,3-Dichloropropene		1	0.13	Ū
100-41-4	Ethylbenzene		1	0.15	U
87-68-3	Hexachlorobutadiene		1	0.20	U
98-82-8	Isopropylbenzene		1	0.14	.U
99-87-6	p-Isopropyltoluene		- 1	0.14	U
75-09-2	Methylene chloride		1	0.21	U
1634-04-4	Methyl t-butyl ether		1	0.14	U
91-20-3	Naphthalene		1	0.16	U
103-65-1	n-Propylbenzene		1	0.12	U
100-42-5	Styrene	·	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane		1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane		1	0.17	U
127-18-4	Tetrachloroethene		1	0.95	·
108-88-3	Toluene	·	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene		1	0.19	U
120-82-1	1,2,4-Trichlorobenzene		1	0.15	U
71-55-6	1,1,1-Trichloroethane		1	0.21	U
79-00-5	1,1,2-Trichloroethane		1	0.21	U
79-01-6	Trichloroethene		1	0.19	U
75-69-4	Trichlorofluoromethane		1	0.14	U
96-18-4	1,2,3-Trichloropropane		1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		1	0.19	U
95-63-6	1,2,4-Trimethylbenzene		1	0.17	U
108-67-8	1,3,5-Trimethylbenzene		1	0.14	U
75-01-4	Vinyl chloride		1	0.18	U
67-64-1	Acetone		1	6.6	U
107-13-1	Acrylonitrile		1	1.5	U
107-05-1	Allyl chloride		1	0.47	U
994-05-8	t-Amyl Methyl ether		1	0.19	U
75-65-0	t-Butyl alcohol		1	9.4	U

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-5

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

1720934-05

File ID:

03AUG21.D

Sampled:

Water 07/31/17 10:15

Prepared:

Laboratory ID:

08/03/17 07:00

Analyzed:

08/03/17 17:09

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0282 Sequence:	<u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND		DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide		1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene		1	1.8	U
60-29-7	Diethyl ether		1	0.33	U
97-63-2	Ethyl methacrylate		1	1.3	U
637-92-3	Ethyl t-butyl ether		1	0.32	Ŭ
67-72-1	Hexachloroethane		1	0.11	U
591-78-6	2-Hexanone		1	5.0	U
126-98-7	Methacrylonitrile		1	2.3	U
78-93-3	Methyl ethyl ketone		1	3.3	U
74-88-4	Methyl iodide		1	1.1	בא ט
108-10-1	Methyl isobutyl ketone		1	2.4	U
80-62-6	Methyl methacrylate		1	1.2	U
76-01-7	Pentachloroethane		1	0.63	UUJ
107-12-0	Propionitrile		1	6,2	U
109-99-9	Tetrahydrofuran		1	5.2	U
179601-23-1	p- & m-Xylenes		1	0.34	U
95-47-6	o-Xylene		1	0.13	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	9.6700	96.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7900	97.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	187987	6.58	200979	6.57	
Chlorobenzene-d5 (IS)	74057	9.61	63715	9.61	
1,4-Difluorobenzene (IS)	280520	7.38	300872	7.38	

^{*} Values outside of QC limits



Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-5

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-05

File ID:

03AUG21.D

Sampled:

07/31/17 10:15

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 17:09

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:

B[H0282

1707017

1713705 Calibration: Instrument: MS-V5 Sequence: CAS NO. COMPOUND **DILUTION** CONC. (ug/L) Q Chloroacetonitrile U 107-14-2 U 109-69-3 1-Chlorobutane 1 1 U 513-88-2 1,1-Dichloropropanone Methyl acrylate 1 U 96-33-3 U 98-95-3 Nitrobenzene 1 79-46-9 2-Nitropropane 1 U

^{*} Values outside of QC limits

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-4

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1720934-06</u>

File ID:

03AUG22.D

Sampled:

07/31/17 09:45

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 17:32

Solids:

Preparation:

EPA 5030 Water MS Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	ע עס
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	. U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	Ŭ
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	5.6	
74-87-3	74-87-3 Chloromethane		0.11	U
95-49-8	95-49-8 2-Chlorotoluene		0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	. 1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

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Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-4

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-06

File ID:

03AUG22.D

Sampled:

07/31/17 09:45

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 17:32

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0282 Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	1.2	
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.30	J
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	, 1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-4

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-06

File ID:

03AUG22.D

Sampled:

07/31/17 09:45

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 17:32

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	1	1.1	עט ט 📗
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	1	0.63	UUJ
107-12-0	Propionitrile	1	6.2	Ū
109-99-9	Tetrahydrofuran	1	5.2	Ŭ
179601-23-1	p- & m-Xylenes	1	0.34	U
95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.540	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7300	97.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	11.510	115	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	189899	6.58	200979	6.57	
Chlorobenzene-d5 (IS)	65647	9.61	63715	9.61	
1,4-Difluorobenzene (IS)	277582	7.38	300872	7.38	

^{*} Values outside of QC limits



Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-4

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-06

File ID:

03AUG22.D

Sampled:

07/31/17 09:45

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 17:32

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0282 Sequence	e: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND		DILUTION	CONC. (ug/L)	Q
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		Ū
79-46-9	2-Nitropropane		1		U

^{*} Values outside of QC limits

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-3

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-07

File ID:

03AUG08.D

Sampled:

07/31/17 10:50

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 12:10

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	B[H0282 Sequence:	<u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND		DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene		1	0.11	.U
108-86-1	Bromobenzene		1	0.15	U
74-97-5	Bromochloromethane		1	0.27	U
75-27-4	Bromodichloromethane		1	0.20	U -
75-25-2	Bromoform		1	0.46	U,
74-83-9	Bromomethane		1	0.20	UUJ
104-51-8	n-Butylbenzene		1	0.15	U
135-98-8	sec-Butylbenzene		1	0.13	U
98-06-6	tert-Butylbenzene		1	0.18	U
56-23-5	Carbon tetrachloride		1	0.17	U
108-90-7	Chlorobenzene		1	0.14	U
75-00-3	Chloroethane		1	0.17	U
67-66-3	Chloroform		1	0.47	J
74-87-3	74-87-3 Chloromethane		1	0.11	U
95-49-8	2-Chlorotoluene		1	0.14	U
106-43-4	4-Chlorotoluene		1	0.093	U
124-48-1	Dibromochloromethane		1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane		1	0.89	U
106-93-4	1,2-Dibromoethane		1	0.22	U
74-95-3	Dibromomethane		1	0.23	· U
95-50-1	1,2-Dichlorobenzene		1	0.21	U
541-73-1	1,3-Dichlorobenzene		1	0.16	U
106-46-7	1,4-Dichlorobenzene		1 .	0.15	U
75-71-8	Dichlorodifluoromethane		1	0.15	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	0.27	U
156-59-2	cis-1,2-Dichloroethene		1	0.27	U
156-60-5	trans-1,2-Dichloroethene		1	0.17	U
78-87-5	1,2-Dichloropropane		1	0.15	U
142-28-9	1,3-Dichloropropane		1	0.13	U
594-20-7	2,2-Dichloropropane		1	0.18	U

8092117

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-3

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-07

File ID:

03AUG08.D

Sampled:

07/31/17 10:50

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 12:10

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	B[H0282 Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	Ŭ
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U .
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	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	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	11	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	1.1	
75-69-4	Trichlorofluoromethane	. 1	0.14	Ŭ
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Stogull

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET **EPA-524.2**

MW-21-3

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-07

File ID:

03AUG08.D

Sampled:

07/31/17 10:50

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 12:10

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	11	0.32	U
67-72-1	Hexachloroethane	11	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	11	2.3	U
78-93-3	Methyl ethyl ketone	11	3.3	U
74-88-4	Methyl iodide	11	1.1	UUJ
108-10-1	Methyl isobutyl ketone	11	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	1	0.63	UVS
107-12-0	Propionitrile	1	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	11	0.34	U
95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.650	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8500	98.5	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.060	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	192456	6.57	200979	6.57	
Chlorobenzene-d5 (IS)	75222	9.61	63715	9.61	
1,4-Difluorobenzene (IS)	290157	7.38	300872	7.38	

^{*} Values outside of QC limits

Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-3

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-07

File ID:

03AUG08.D

Sampled:

07/31/17 10:50

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 12:10

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0282	Sequence:	<u>1713705</u>	Calibration:	<u>1707017</u>	Instrument:	MS-V5
CAS NO.	COMPOUND)		DILUTION	C	ONC. (ug/L)	Q
107-14-2	Chloroacetoni	itrile		1			U
109-69-3	1-Chlorobutar	ne		1			U
513-88-2	1,1-Dichlorop	oropanone		1			U
96-33-3	Methyl acryla	ite		1			U
98-95-3	Nitrobenzene			1			U
79-46-9	2-Nitropropan	1e		1			U

^{*} Values outside of QC limits

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-2

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1720934-08</u>

File ID:

04AUG08.D

Sampled:

07/31/17 11:30

Prepared:

08/03/17 07:00

Analyzed:

08/04/17 11:59

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Solius.	•	5 14 ·	1505015	140 146
Batch:	B[H0282 Sequence: 1713791	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	· 1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	11	0.15	U
135-98-8	sec-Butylbenzene	11	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	11	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.16	J
74-87-3	Chloromethane	1	0.11	U .
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1 .	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	Ū
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	Ŭ
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	Ū
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U



Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-2

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-08

File ID:

04AUG08.D

Sampled:

07/31/17 11:30

Prepared:

08/03/17 07:00

Analyzed:

08/04/17 11:59 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0282 Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1.	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	Ū
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.56	
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	. 1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-2

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-08

File ID:

04AUG08.D

Sampled:

07/31/17 11:30

Prepared:

Preparation:

08/03/17 07:00

Analyzed:

08/04/17 11:59

Solids:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

1707017 Batch: B[H0282 1713791 Calibration: MS-V5 Sequence: Instrument: CAS NO. COMPOUND DILUTION CONC. (ug/L) Q Carbon disulfide 75-15-0 0.48 U trans-1,4-Dichloro-2-butene 1 U 110-57-6 1.8 Diethyl ether 0.33 U 60-29-7 97-63-2 Ethyl methacrylate 1.3 U Ethyl t-butyl ether U 637-92-3 0.32 67-72-1 Hexachloroethane 1 0.11 U 591-78-6 U 2-Hexanone 5.0 126-98-7 Methacrylonitrile 1 2.3 U Methyl ethyl ketone 1 3.3 U 78-93-3 74-88-4 Methyl iodide 1 1.1 U V Methyl isobutyl ketone 1 2.4 U 108-10-1 Methyl methacrylate 1 1.2 U 80-62-6 Pentachloroethane 1 0.63 U 76-01-7 Propionitrile 1 6.2 U 107-12-0 Tetrahydrofuran U 109-99-9 1 5.2 p- & m-Xylenes 1 0.34 U 179601-23-1 U 95-47-6 o-Xylene 1 0.13

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.1000	91.0	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9900	99.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.120	101	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	210639	6.57	230753	6.57	
Chlorobenzene-d5 (IS)	87620	9.62	81486	9.61	
1,4-Difluorobenzene (IS)	300855	7.38	338008	7.38	

^{*} Values outside of QC limits

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-2

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-08

File ID:

04AUG08.D

Sampled:

07/31/17 11:30

Prepared:

08/03/17 07:00

Analyzed:

08/04/17 11:59

Solids:

EPA 5030 Water MS

Initial/Final:

Preparation:

25 ml / 25 ml

1713791

Calibration:

1707017

Batch:	B[H0282	Sequence:	<u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND			DILUTION	CONC. (ug/L)	Q
107-14-2	Chloroacetoni	trile		1		U
109-69-3	1-Chlorobutan	e		1		U
513-88-2	1,1-Dichloropa	ropanone		1		U
96-33-3	Methyl acrylat	te		1		U
98-95-3	Nitrobenzene			1		U
79-46-9	2-Nitropropan	e		1		U

^{*} Values outside of QC limits

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-1

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-09

File ID:

03AUG24.D

Sampled:

07/31/17 12:00

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 18:18

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	. 1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	UU
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	Ü
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.61	
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U .
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	. 1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	. 1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U .
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

8007417

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-1

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-09

File ID:

03AUG24.D

Sampled:

07/31/17 12:00

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 18:18

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	1707017 Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U.
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	11	0.20	J
75-69-4	Trichlorofluoromethane	11	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	11	0.19	U
95-63-6	1,2,4-Trimethylbenzene	. 1	0.17	Ū
108-67-8	1,3,5-Trimethylbenzene	1	0.14	Ü
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-1

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-09

File ID:

03AUG24.D

Sampled:

07/31/17 12:00

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 18:18

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>17137</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	-1	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	Ū
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3,3	U
74-88-4	Methyl iodide	1	1.1	UU
108-10-1	Methyl isobutyl ketone	1	2.4	Ū
80-62-6	Methyl methacrylate	1	1.2	Ŭ
76-01-7	Pentachloroethane	1	0.63	UUJ
107-12-0	Propionitrile	1	6.2	Ū
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.34	U
95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	11.010	110	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8900	98.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.340	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	188879	6.58	200979	6.57	
Chlorobenzene-d5 (IS)	71207	9.62	63715	9.61	
1,4-Difluorobenzene (IS)	275631	7.38	300872	7.38	

^{*} Values outside of QC limits



Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-21-1

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-09

File ID:

03AUG24.D

Sampled:

07/31/17 12:00

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 18:18

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

1707017 B[H0282 1713705 MS-V5 Batch: Sequence: Calibration: Instrument: COMPOUND **DILUTION** CONC. (ug/L) CAS NO. Q Chloroacetonitrile U 107-14-2 U 109-69-3 1-Chlorobutane 1 1,1-Dichloropropanone 1 U 513-88-2 Methyl acrylate 1 U 96-33-3 1 Nitrobenzene U 98-95-3 79-46-9 2-Nitropropane 1 U

^{*} Values outside of QC limits

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-6-073117

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

Troject

File ID:

03AUG25.D

Sampled:

07/31/17 12:15

Prepared:

1720934-10 08/03/17 07:00

Analyzed:

<u>08/03/17 18:41</u>

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	B[H0282 Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	DV U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	· U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	. 1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

8697117



Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-6-073117

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1720934-10</u>

File ID:

03AUG25.D

Sampled:

07/31/17 12:15

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 18:41

Solids:

Preparation:

EPA 5030 Water MS Initial/Final:

25 ml / 25 ml

1707017 B[H0282 1713705 Calibration: MS-V5 Batch: Sequence: Instrument: CONC. (ug/L) DILUTION CAS NO. **COMPOUND** Q 563-58-6 1,1-Dichloropropene 0.19 U cis-1,3-Dichloropropene 1 0.14 U 10061-01-5 trans-1,3-Dichloropropene 1 0.13 U 10061-02-6 1 U 100-41-4 Ethylbenzene 0.15 Hexachlorobutadiene 1 0.20 U 87-68-3 Isopropylbenzene 1 0.14 U 98-82-8 1 0.14 U p-Isopropyltoluene 99-87-6 1 U Methylene chloride 0.21 75-09-2 1 U Methyl t-butyl ether 0.14 1634-04-4 Naphthalene 1 0.16 U 91-20-3 n-Propylbenzene 1 0.12 U 103-65-1 1 0.12 U 100-42-5 Styrene 1,1,1,2-Tetrachloroethane 1 0.21 U 630-20-6 1 U 1,1,2,2-Tetrachloroethane 0.17 79-34-5 127-18-4 Tetrachloroethene 1 0.23 U 1 U Toluene 0.17 108-88-3 1,2,3-Trichlorobenzene 1 0.19 U 87-61-6 1,2,4-Trichlorobenzene 1 0.15 U 120-82-1 1 U 1,1,1-Trichloroethane 0.21 71-55-6 1,1,2-Trichloroethane 1 0.21 U 79-00-5 Trichloroethene 1 0.19 U 79-01-6 Trichlorofluoromethane 1 0.14 U 75-69-4 1 0.78 1,2,3-Trichloropropane U 96-18-4 1,1,2-Trichloro-1,2,2-trifluoroethane 1 76-13-1 0.19 U 1 U 95-63-6 1,2,4-Trimethylbenzene 0.17 1,3,5-Trimethylbenzene 1 0.14 U 108-67-8 75-01-4 Vinyl chloride 1 0.18 U Acetone 1 6.6 U 67-64-1 Acrylonitrile 1 107-13-1 1.5 U 1 0.47 107-05-1 Allyl chloride U 1 t-Amyl Methyl ether 0.19 U 994-05-8 t-Butyl alcohol 1 9.4 U 75-65-0

Stop47

BC Laboratories, Inc, Page 51 of 315

Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-6-073117

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-10

File ID:

03AUG25.D

Sampled:

07/31/17 12:15

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 18:41

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	. 1	1.1	U 45
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	1	0.63	UUT
107-12-0	Propionitrile	1	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.34	Ū ·
95-47-6	o-Xylene	1	0.13	ប

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	11.100	111	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.010	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8800	98.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	185070	6.57	200979	6.57	
Chlorobenzene-d5 (IS)	75442	9.62	63715	9.61	
1,4-Difluorobenzene (IS)	276520	7.38	300872	7.38	

^{*} Values outside of QC limits



Reported: 8/25/2017 12:56:21PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-6-073117

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

File ID:

03AUG25.D

Sampled:

07/31/17 12:15

Prepared:

1720934-10 08/03/17 07:00

Analyzed:

08/03/17 18:41

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

ВГН0282

Sequence:

1713705

Calibration:

1707017

Batch:	B[H0282	Sequence:	<u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND)		DILUTION	CONC. (ug/L)	Q
107-14-2	Chloroacetoni	itrile		1		U ·
109-69-3	1-Chlorobutar	ne		1		U
513-88-2	1,1-Dichlorop	oropanone		1		U
96-33-3	Methyl acryla	ite		1		U
98-95-3	Nitrobenzene			1		U
79-46-9	2-Nitropropan	10		1		U

^{*} Values outside of QC limits



Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

SB-2-073117

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-11

File ID:

03AUG26.D

Sampled:

07/31/17 12:30

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 19:04 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	UU
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	11	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

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Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

SB-2-073117

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-11

File ID:

03AUG26.D

Sampled:

07/31/17 12:30

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 19:04 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

.

Batch:	<u>B[H0282</u> Sequence: <u>1713705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	. 1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	Ŭ
127-18-4	Tetrachloroethene	. 1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	. 1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	. U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

SB-2-073117

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-11

File ID:

03AUG26.D

Sampled:

07/31/17 12:30

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 19:04

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0282</u> Sequence: <u>17</u>	<u>13705</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	·	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide		1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene		1	1.8	U
60-29-7	Diethyl ether		1	0.33	Ū
97-63-2	Ethyl methacrylate		1	1.3	U
637-92-3	Ethyl t-butyl ether		1	0.32	U
67-72-1	Hexachloroethane		11	0.11	U
591-78-6	2-Hexanone		11	5.0	U
126-98-7	Methacrylonitrile		1	2.3	U
78-93-3	Methyl ethyl ketone		1	3.3	U
74-88-4	Methyl iodide		11	1.1	UUJ
108-10-1	Methyl isobutyl ketone		1	2.4	U
80-62-6	Methyl methacrylate		1	1.2	U
76-01-7	Pentachloroethane		1	0.63	UUJ
107-12-0	Propionitrile		11	6.2	U
109-99-9	Tetrahydrofuran		1	5.2	U
179601-23-1	p- & m-Xylenes		11	0.34	U
95-47-6	o-Xylene		1	0.13	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	9.9100	99.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9000	99.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	189426	6.57	200979	6.57	
Chlorobenzene-d5 (IS)	75627	9.61	63715	9.61	
1,4-Difluorobenzene (IS)	275283	7.38	300872	7.38	

^{*} Values outside of QC limits



Reported: 8/25/2017 12:56:21PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

SB-2-073117

Laboratory:

BC Laboratories

SDG:

17-20934

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1720934-11

File ID:

03AUG26.D

Sampled:

07/31/17 12:30

Prepared:

08/03/17 07:00

Analyzed:

08/03/17 19:04

Solids:

Preparation:

25 ml / 25 ml

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0282	Sequence:	<u>1713705</u>	Calibration:	1707017	Instrument:	MS-V5	
CAS NO.	COMPOUND)		DILUTION	CC	NC. (ug/L)	Q	
107-14-2	Chloroacetoni	trile		1			U	
109-69-3	1-Chlorobutar	ne		1			U	
513-88-2	1,1-Dichlorop	ropanone		1			U	
96-33-3	Methyl acryla	te		1			U	
98-95-3	Nitrobenzene			1			U	
79-46-9	2-Nitropropan	ie		1			U	

^{*} Values outside of QC limits

VALIDATION COMPLETENESS WORKSHEET LDC #: 39385B1

Level III/IV

Laboratory: BC Laboratories, Inc.

SDG #: 17-20934

Reviewer: 2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	AA	RSD=20/0. Y2 10/<30/2
IV.	Continuing calibration	W	CCV & 30/0
V.	Laboratory Blanks	\triangle	
VI.	Field blanks	ND	TB=1. ZB=10.5B=11
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	LA-	
IX.	Laboratory control samples	A	109
X.	Field duplicates	\mathcal{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 was underwent Level IV review

1110	tales sample was underwent Lever to Teview			
	Client ID	Lab ID	Matrix	Date
1	TB-6-073117	1720934-01	Water	07/31/17
2	MW-4-3	1720934-02	Water	07/31/17
3	MW-4-2	1720934-03	Water	07/31/17
4	MVV-4-1	1720934-04	Water	07/31/17
5	MW-21-5	1720934-05	Water	07/31/17
6	MW-21-4	1720934-06	Water	07/31/17
7	MW-21-3	1720934-07	Water	07/31/17
82	MW-21-2**	1720934-08**	Water	07/31/17
9	MVV-21-1	1720934-09	Water	07/31/17
10	EB-6-073117	1720934-10	Water	07/31/17
11	SB-2-073117	1720934-11	Water	07/31/17
12	MW-21-3MS	1720934-07MS	Water	07/31/17
13	MW-21-3MSD	1720934-07MSD	Water	07/31/17

LDC#: 39385B1

VALIDATION FINDINGS CHECKLIST

Page:_	/of 3
Reviewer:_	9
2nd Reviewer:	KK

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?				
Was cooler temperature criteria met?		okwilozowa d William		
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?	~			
Were the BFB performance results reviewed and found to be within the specified criteria?				
III, Initial calibration	·			
Did the laboratory perform at least 5 point calibration prior to sample analysis?				
Were all percent relative standard deviations (%RSD) ≤ 20%?				Carron VI sing in a procession of the SAN processor for the SAN pr
IIIa, Initial Calibration Verification calibration				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?				
Were all percent differences (%D) ≤ 30%?				
IV. Continuing calibration				
Was a continuing calibration standard analyzed at the beginning of each analysis batch?		_		
Were all percent differences (%D) of continuing calibration ≤ 30%?				
V.Laboratory Blanks		-	ı	
Was a laboratory blank associated with every sample in this SDG?				
Was a laboratory blank analyzed with each analysis batch?	/		<u> </u>	
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.				
VI. Field blanks				
Field blanks were identified in this SDG.				
Target compounds were detected in the field blanks.				
VII. Surrogate spikes	1	n.		
Were all surrogate %R within the 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?				
VIII. Matrix spike/Matrix spike duplicates			1.00	
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	/	<u> </u>		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	/			
IX. Laboratory control samples		ł		
Was an LCS analyzed for this SDG?	1	<u></u>		



VALIDATION FINDINGS CHECKLIST

Page: Of A Reviewer: Of A 2nd Reviewer: VIL

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per analytical batch?				1
Were the LCS percent recoveries (%R) within 70-130%?				
X, Field duplicates				
Field duplicate pairs were identified in this SDG.				
Target compounds were detected in the field duplicates.			/	
XI. Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?				
Were retention times within +/-30 seconds of the associated calibration standard?				
XII. Compound quantitation/CRQLs			T	
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	/			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	Ĺ			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?				
Were chromatogram peaks verified and accounted for?				
XIV. System performance	7		77710	
System performance was found to be acceptable.	1	/		
XV. Overall assessment of data	I			
Overall assessment of data was found to be acceptable.			<u> </u>	

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. lodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methylcyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Reviewer: 4 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".

N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Were all percent differences (%D) < 30% ?

N/W	N/A vvere all pe	ercent differences (%D) < 3	0% ?			
#	Date	Standard ID	Compound	Finding %D (Limit: <u>≤</u> 30.0%)	Associated Samples	Qualifications
	8/3/17	03AU402	B	50.5	1-7. 9-13. MB	JUNA
		/	Methyl Fatirodide	50.5 6/.7 35.5	(ND)	
			2222	35.5		
$\parallel \rightarrow$	8/4/17	04AK403	Methyliadide	51.8 33.9	8. NB (ND)	JUN P
		<u> </u>	2222	33.9		1
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LDC #: 39385B1

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

Page:_	/ of /
Reviewer:	9
2nd Reviewer:	W

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

 $RRF = (A_x)(C_{is})/(A_{is})(C_x)$

average RRF = sum of the RRFs/number of standards %RSD = 100 * (S/X)

 $A_v =$ Area of compound,

A_{is} = Area of associated internal standard C_{is} = Concentration of internal standard

 $\hat{C_x}$ = Concentration of compound,

S = Standard deviation of the RRFs

X = Mean of the RRFs

(4th internal standard)

					Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
#	Standard ID	Calibration Date	Compound	(Reference Internal Standard)	RRF (10 std)	RRF (10 std)	Average RRF (initial)	Average RRF (initial)	%RSD	%RSD
1_1_	ICAL	7/20/17	К	(1st internal standard)	0.7797252	0.7797252	0.7571101	0.7571101	5.641054	5.641053
	(V5)		S	(2nd internal standard)	0.3603684	0.3603684	0.3434012	0.3434012	3.079274	3.079306
			EE	(3rd internal standard)	2.063766	2.063766	1.948304	1.948304	6.711166	6.711173
			BB	(4th internal standard)						
2			к	(1st internal standard)						
			s	(2nd internal standard)						
			AA	(3rd internal standard)						
			BB	(4th internal standard)						
3			К	(1st internal standard)						
			s	(2nd internal standard)						
			AA	(3rd internal standard)						
			BB	(4th internal standard)						
4		,	К	(1st internal standard)						
:			S	(2nd internal standard)						
			AA	(3rd internal standard)						

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.

AA BB LDC #: 39385B1

VALIDATION FINDINGS WORKSHEET <u>Continuing Calibration Results Verification</u>

Page:_	1 of
Reviewer:	<i>'</i>
2nd Reviewer:	M

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

Where: ave. RRF = initial calibration average RRF

 $RRF = (A_x)(C_{is})/(A_{is})(C_x)$

RRF = continuing calibration RRF

 A_x = Area of compound,

 A_{is} = Area of associated internal standard C_{is} = Concentration of internal standard

 C_x = Concentration of compound, C_{is} = C_0

·								·	
#	Standard ID	Calibration Date	Compound (R	eference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	04aug02	8/4/17	K	(1st internal standard)	0.7571101	0.7733756	0.7733756	2.1	2.1
			S	(2nd internal standard)	0.3434012	0.3649989	0.3649989	6.3	6.3
			EE	(3rd internal standard)	1.948304	2.011687	2.011687	3.3	3.3
<u> </u>			BB	(4th internal standard)					
2			К	(5th internal standard)					
			S	(2nd internal standard)					
			AA	(3rd internal standard)					
			RR	(4th internal standard)					
3			QQQ	(1st internal standard)					
			S	(2nd internal standard)				-	
		•	AA	(3rd internal standard)					
			МММ	(4th internal standard)					
4			BB	(5th internal standard)					
			S	(2nd internal standard)					
			AA	(3rd internal standard)					
		· 	ВВ	(4th internal standard)		,	·		

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.

VALIDATION FINDINGS WORKSHEET Surrogate Results Verification

Page:_	
Reviewer:	9
2nd reviewer:	W

METHOD: GC/MS VOA (EPA Method 524.2)

The percent rec	overies (%F	R) of surrogates we	ere recalculated for the	compounds identifie	ed below using t	the following	calculation:
-----------------	-------------	---------------------	--------------------------	---------------------	------------------	---------------	--------------

% Recovery: SF/SS * 100

Where: SF = Surrogate Found SS = Surrogate Spiked

8 Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.00	9.99	99.9	99.9	0
Bromofluorobenzene		10.12	101	101	/
1,2-Dichlorobenzene-d4		9.10	91.0	91.0	d
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				<u></u>	

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates Results Verification

Page:_	of
Reviewer:	0
2nd Reviewer:	W

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (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 = I MSC - MSC I * 2/(MSC + MSDC)

MSC = Matrix spike concentration

MSDC = Matrix spike duplicate concentration

MS/MSD sample:

		pike id e Øi	Sample Concentgation	Spiked S Concent	wation	Matrix	Spike	Matrix Spike	Duplicate	Ms	S/MSD
Compound	()	idedi CFC)	(Nepe)	jus	24	Percent R	ecovery	Percent R	ecovery	F	RPD
	MS	MSD		MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	25.00	2500	NO	30.78	27.20	123	123	109	109	12.	/2/
Trichloroethene			1.06	30.140	27.520	116	116	106	106	9.09	9.09
Benzene			NO	25.92	23.430	104	104	937	93.7	10.1	10.1
Toluene				27.270	26.260	109	109	105	105	3.77	3.77
Chlorobenzene			 	24.370	23,200	97.5	97.5	92.8	928	4.92	4.92

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualific	<u>ations and associated samples when repo</u>	orted results do not agree within 10.0%
of the recalculated results.		

VALIDATION FINDINGS WORKSHEET Laboratory Control Sample Results Verification

Page:_	<u></u>
Reviewer:_	9_
2nd Reviewer:	CK

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 = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: <u>BIH 0282-BS</u>

	s	pike	Spiked S	•		:s	ıc	SD	LCS	/LCSD
Compound	2	ldød L)	Concent	tration -	Percent F	Recovery	Percent F	Recovery	R	RPD
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	25.000	NÁ	28.970	NÄ	116	116				
Trichloroethene		1	27.730	1_	111	111				
Benzene			24.330		97.3	97.3				
Toluene	/		26.730		107	107				
Chlorobenzene	V		25,180	• /	101	101				

Comments:	Refer to Laborator	y Control Samp	le findings worksh	<u>eet for list of qu</u>	<u>ialifications and</u>	associated	samples when	reported re	sults do not a	gree within	10.0% of the
recalculated	results.										

VALIDATION FINDINGS WORKSHEET **Sample Calculation Verification**

Page:_	
Reviewer:_	
2nd reviewer:	PV

METHOD: GC/MS VOA (EPA Method 524.2)

N N/A Were all reported results recalculated and verified for all level IV samples? N N/A

Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Example: Concentration = $(A_s)(I_s)(DF)$ $\overline{(A_{is})(RRF)(V_o)(\%S)}$ Area of the characteristic ion (EICP) for the compound to be measured Area of the characteristic ion (EICP) for the specific internal standard Amount of internal standard added in nanograms (ng) Relative response factor of the calibration standard. **RRF** Volume or weight of sample pruged in milliliters (ml) V. or grams (g). Df Dilution factor. Percent solids, applicable to soils and solid matrices %S

#	Sample ID	Compound	Reported Concentration	Calculated Concentration ()	Qualification
	8	☆ A	0.56		
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		<u> </u>			

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 20, 2017

Parameters:

Chromium

Validation Level:

Level III

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-20934

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-4-3	1720934-02	Water	07/31/17
MW-4-2	1720934-03	Water	07/31/17
MW-4-1	1720934-04	Water	07/31/17
MW-21-5	1720934-05	Water	07/31/17
MW-21-4	1720934-06	Water	07/31/17
MVV-21-3	1720934-07	Water	07/31/17
MW-21-2**	1720934-08**	Water	07/31/17
MW-21-1	1720934-09	Water	07/31/17
EB-6-073117	1720934-10	Water	07/31/17
SB-2-073117	1720934-11	Water	07/31/17
MW-21-3MS	1720934-07MS	Water	07/31/17
MW-21-3MSD	1720934-07MSD	Water	07/31/17
MW-21-3DUP	1720934-07DUP	Water	07/31/17

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chromium by Environmental Protection Agency (EPA) Method 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

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

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

IV. ICP Interference Check Sample Analysis

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

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium	0.72300 ug/L	All samples in SDG 17-20934

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-4-1	Chromium	1.8 ug/L	1.8U ug/L
MW-21-5	Chromium	2.6 ug/L	2.6U ug/L
MW-21-4	Chromium	3.0 ug/L	3.0U ug/L
MW-21-2**	Chromium	1.8 ug/L	1.8U ug/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-21-1	Chromium	3.1 ug/L	3.1U ug/L
EB-6-073117	Chromium	2.3 ug/L	2.3U ug/L
SB-2-073117	Chromium	1.9 ug/L	1.9U ug/L

VI. Field Blanks

Sample EB-6-073117 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration		
EB-6-073117	Chromium	2.3 ug/L		

Sample SB-2-073117 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration		
SB-2-073117	Chromium	1.9 ug/L		

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

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

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

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

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Raw data were not reviewed for Level III validation.

XIII. Sample Result Verification

Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

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

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

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NASA JPL, 3Q2017 Chromium - Data Qualification Summary - SDG 17-20934

No Sample Data Qualified in this SDG

NASA JPL, 3Q2017 Chromium - Laboratory Blank Data Qualification Summary - SDG 17-20934

Sample	Analyte	Modified Final Concentration	A or P
MW-4-1	Chromium	1.8U ug/L	А
MW-21-5	Chromium	2.6U ug/L	А
MW-21-4	Chromium	3.0U ug/L	А
MW-21-2**	Chromium	1.8U ug/L	А
MW-21-1	Chromium	3.1U ug/L	А
EB-6-073117	Chromium	2.3U ug/L	А
SB-2-073117	Chromium	1.9U ug/L	А

Environmental Testing Laborato
Tidewater Inc.

Reported: 8/25/2017 1:02:11PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-4-3

Laboratory: BC Laboratories

3761 Attucks Drive Powell, OH 43065

SDG: <u>17-20934</u>

Client: <u>Tidewater Inc.</u>

Project: JPL- GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-02</u>

File ID: PE-EL3 170803R-168

Sampled: 07/31/17 07:35

Prepared: <u>08/03/17 08:00</u>

Analyzed: 08/04/17 02:28

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0275</u>

Sequence: <u>1713865</u>

55

Calibration: <u>UNASSIGNED</u>

Instrument: PE-EL3

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	8.6	1		EPA-200.8

Mg2117

Reported: 8/25/2017 1:02:11PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-4-2

Laboratory: BC Laboratories

SDG: 17-20934

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1720934-03</u>

File ID: PE-EL3 170803R-169

Sampled: 07/31/17 08:05

Prepared: 08/03/17 08:00

Analyzed: 08/04/17 02:31

Solids: 0.00 Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: BIH0275

Sequence: 1713865 Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	4.2	1.		EPA-200.8

Reported: 8/25/2017 1:02:11PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-4-1

Laboratory:

Client:

Tidewater Inc.

3761 Attucks Drive

Powell, OH 43065

BC Laboratories

Tidewater Inc.

SDG: 17-20934

Calibration: <u>UNASSIGNED</u>

Project: JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID: <u>1720934-04</u>

File ID: PE-EL3 170803R-170

Sampled:

07/31/17 08:30

Sequence:

Prepared: 08/03/17 08:00

Analyzed: 08/04/17 02:34

Solids:

0.00

Batch: <u>B[H0275</u>

Preparation: EPA 200.2 1713865

Initial/Final: 50 ml / 50 ml

Instrument: PE-EL3

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

2092117

Reported: 8/25/2017 1:02:11PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-21-5

Laboratory: BC Laboratories

SDG: <u>17-20934</u>

Client: Tidewater Inc.

Project: JPL- GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-05</u>

File ID: PE-EL3 170803R-171

Sampled: 07/31/17 10:15

Prepared: <u>08/03/17 08:00</u>

Analyzed: 08/04/17 02:38

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0275</u>

Sequence: <u>1713865</u>

Calibration: <u>UNASSIGNED</u>

Instrument: PE-EL3

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.6 U	1	J	EPA-200.8

Mapy

Reported: 8/25/2017 1:02:11PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-21-4

Laboratory: BC Laboratories

SDG: 17-20934

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water

Laboratory ID: <u>1720934-06</u>

File ID: PE-EL3 170803R-172

07/31/17 09:45 Sampled:

08/03/17 08:00 Prepared:

Analyzed: 08/04/17 02:41

Solids: <u>0.00</u>

Matrix:

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0275</u>

1713865 Sequence:

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.0 U	1		EPA-200.8

Reported: 8/25/2017 1:02:11PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-21-3

Laboratory: BC Laboratories

SDG: 17-20934

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water Laboratory ID: <u>1720934-07</u>

File ID: PE-EL3_170803R-160

Sampled: 07/31/17 10:50 Prepared: 08/03/17 08:00

Analyzed: 08/04/17 02:00

Solids: 0.00 Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0275</u>

Sequence:

<u>1713865</u>

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	4.2	1		EPA-200.8

Reported: 8/25/2017 1:02:11PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-21-2

Laboratory: BC Laboratories

SDG: 17-20934

Client: Tidewater Inc. Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-08</u>

File ID: PE-EL3 170803R-173

07/31/17 11:30 Sampled:

08/03/17 08:00 Prepared:

Analyzed: 08/04/17 02:45

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0275</u>

1713865 Sequence:

Calibration: <u>UNASSIGNED</u>

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

Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 1:02:11PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-21-1

Laboratory: BC Laboratories

SDG: 17-20934

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: 1720934-09

File ID: PE-EL3 170803R-174

Sampled: <u>07/31/17 12:00</u>

Prepared: 08/03/17 08:00

Analyzed: 08/04/17 02:48

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: B[H0275

1713865 Sequence:

Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.1 V	1		EPA-200.8

Reported: 8/25/2017 1:02:11PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

EB-6-073117

Laboratory: BC Laboratories

SDG: <u>17-20934</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-10</u>

File ID: PE-EL3 170803R-175

Sampled: 07/31/17 12:15

Prepared: 08/03/17 08:00

Analyzed: 08/04/17 02:52

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0275</u>

Sequence: <u>1713865</u>

Calibration: UNASSIGNED

Instrument: PE-EL3

	CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
Γ	7440-47-3	Total Recoverable Chromium	2.3 U	1	J	EPA-200.8

Showing

Reported: 8/25/2017 1:02:11PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

SB-2-073117

Laboratory: BC Laboratories

SDG: 17-20934

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: 1720934-11

File ID: PE-EL3 170803R-176

Sampled: 07/31/17 12:30

Prepared: 08/03/17 08:00

Analyzed: 08/04/17 02:55

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0275</u>

Sequence:

1713865

Calibration: <u>UNASSIGNED</u>

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

VALIDATION COMPLETENESS WORKSHEET

Level III

SDG #: 17-20934 Laboratory: BC Laboratories, Inc.

LDC #: 39385B4a

Date: 9/18/17 Page: of ! Reviewer: 2nd Reviewer:

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/A	
II.	ICP/MS Tune	A-	
111.	Instrument Calibration	A	·
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not Required
V.	Laboratory Blanks	SW	Ö
VI.	Field Blanks	SW	EB-9, SB= 10
VII.	Matrix Spike/Matrix Spike Duplicates	A	,
VIII.	Duplicate sample analysis	A	< 5x RL; ok by Difference
IX.	Serial Dilution	N	< 5x RL; OK by Difference
X.	Laboratory control samples	A	Les
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	+	
XIII.	Sample Result Verification	N_	
ΧIV	Overall Assessment of Data	A	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

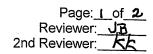
ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

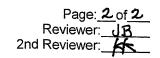
Client ID Lab ID Matrix Date 1720934-02 Water 07/31/17 MW-4-3 MW-4-2 1720934-03 Water 07/31/17 1720934-04 Water MW-4-1 07/31/17 MW-21-5 1720934-05 Water 07/31/17 4 5 MVV-21-4 1720934-06 Water 07/31/17 MW-21-3 1720934-07 Water 07/31/17 6 1720934-08** MW-21-2** Water 07/31/17 8 MW-21-1 1720934-09 Water 07/31/17 9 EB-6-073117 1720934-10 Water 07/31/17 10 SB-2-073117 1720934-11 Water 07/31/17 MW-21-3MS 1720934-07MS Water 07/31/17 11 12 1720934-07MSD Water MW-21-3MSD 07/31/17 MW-21-3DUP 1720934-07DUP Water 07/31/17 13

Notes:



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

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%?	\checkmark			
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 the low standard checks within 70-130%			✓	
Were all initial calibration correlation coefficients within limits as specified by the method?	/			
IV. Blanks				′
Was a method blank associated with every sample in this SDG?	\checkmark			
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.	1			
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were \leq 5X the RL, including when only one of the duplicate sample values were \leq 5X the RL.	/			
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	1		1	
Was an LCS analyzed per extraction batch?	1	<u> </u>	ļ	
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)?			1	
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.			1	
XIII. Field blanks				
Field blanks were identified in this SDG.	1			
Target analytes were detected in the field blanks.	7			

LDC #: 39385B4a	
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VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: NA
Associated Samples: A11

Page: 1 of 1
Reviewer: JB
2nd Reviewer: **V**J

										THE SECTION SECTION		
Analyte	Maximum PB ^a (mg/Kg)	PB ^a	Maximum ICB/CCB ^a (mg/l)		3	4	5	7	8	9	10	
Cr		0.72300		3.615	1.8	2.6	3.0	1.8	3.1	2.3	1.9	

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 #: <u>39385</u>B42 SDG #: <u>17-201</u>34

VALIDATION FINDINGS WORKSHEET <u>Field Blanks</u>

Page: 1 of 1

Reviewer: 3

2nd reviewer: K

METHOD: Trace Metals (EPA CLP SOW ILM02.1) N N/A Were field blanks identified in this SDG? Were target analytes detected in the field blanks? Sample: __ _(circle one) Concentration Sample: _____ to ____ Field Blank / Trip Blank / Rinsate / Other_ (circle one) Concentration Units (4914)

LDC #: 3 9385B4a

VALIDATION FINDINGS WORKSHEET Initial and Continuing Calibration Calculation Verification

	Page:_	1	_of_	1
	Reviewer:	,	JB	
2nd	Reviewer:	1	U	/

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:

 $%R = Found \times 100$

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 True

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)	·		1			
エでく	ICP/MS (Initial calibration)	0-	50.062 mg/L	50.000 mg 1L	10070	100%	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)		-		·		
661	ICP/MS (Continuing calibration)	Cr	39.480 mg/L	40.000 mg/L	99.27	99.27.	Y
	CVAA (Continuing calibration)		7				

Comments:			
		. <u></u>	

LDC #: 39385B4~ SDG #: 17-20934

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Reviewer: JB 2nd Reviewer: _____

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

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

 $%R = Found \times 100$ True

Where, Found = Concentration of each analyte <u>measured</u> 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:

 $RPD = |S-D| \times 100$ (S+D)/2

Where, S =

Original sample concentration

Duplicate sample concentration D =

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

 $%D = |I-SDR| \times 100$

Where, I=

Initial Sample Result (ug/L)

SDR = Serial Dilution Result (ug/L) (Instrument Reading x 5)

			Fam. 1/0/1	T (D (CDD (Recalculated	Reported	
Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	%R / RPD / %D	%R / RPD / %D	Acceptable (Y/N)
	ICP interference check						
LCS	Laboratory control sample	Cr	38.783 mg/L	اور ٥٥٥ ، 40	97.07.	97.07.	Y
MS	Matrix spike	Cr	4.237 (SSR-SR) 41.031-4.237- 34.794491L	40.000 mg/L	92-02	92.07。	Y
MSD	Duplicate	Ċ-	39.611.43	Founs: 41.021 2191-	3.52%	3.527- RPD	Y
·	ICP serial dilution			J		/	

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3938584a SDG #: 17-20934

Y N N/A

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

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

Have results been reported and calculated correctly?

Page:_ <u>I</u>	_of I
Reviewer:	UB
2nd reviewer:	kb

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

Y N	N/A Are results w N/A Are all detect	ithin the calibrated range of the instrume ion limits below the CRDL?	ents and within the line	ear range of the IC	P?			
Detec equati	ted analyte results for _ ion:	Cr	were recalculated	were recalculated and verified using the following				
RD FV In. Vol. Dil	ntration = \(\frac{(RD)(FV)(Dil)}{(ln. Vol.)}\) = Raw data concer = Final volume (ml = Initial volume (ml = Dilution factor	l)	Raw Date! 1.8	033 mg 1L				
#	Sample ID	Analyte	Reported Concentration (1141L)	Calculated Concentration	Acceptable (Y/N)			
	7	Cr	1.8	1.8	У			
	,							
Note:								

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 20, 2017

Parameters:

Wet Chemistry

Validation Level:

Level III & IV

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-20934

Sample Identification	Laboratory Sample Identification	Matrix	Collection
Sample Identification			Date
MW-4-3	1720934-02	Water	07/31/17
MW-4-2	1720934-03	Water	07/31/17
MW-4-1	1720934-04	Water	07/31/17
MW-21-5	1720934-05	Water	07/31/17
MW-21-4	1720934-06	Water	07/31/17
MW-21-3	1720934-07	Water	07/31/17
MW-21-2**	1720934-08**	Water	07/31/17
MW-21-1	1720934-09	Water	07/31/17
EB-6-073117	1720934-10	Water	07/31/17
SB-2-073117	1720934-11	Water	07/31/17
MW-21-3MS	1720934-07MS	Water	07/31/17
MW-21-3MSD	1720934-07MSD	Water	07/31/17
MW-21-3DUP	1720934-07DUP	Water	07/31/17

^{**}Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

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

Perchlorate by EPA Method 314.0

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

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

III. Continuing Calibration

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

IV. Laboratory Blanks

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

V. Field Blanks

Sample EB-6-073117 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration
EB-6-073117	Perchlorate	0.75 ug/L

Sample SB-2-073117 was identified as a source blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

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

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

NASA JPL, 3Q2017 Wet Chemistry - Data Qualification Summary - SDG 17-20934

No Sample Data Qualified in this SDG

NASA JPL, 3Q2017 Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 17-20934

No Sample Data Qualified in this SDG

Sequence:

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 12:59:28PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

MW-4-3

Laboratory: BC Laboratories

SDG: 17-20934

Calibration: <u>UNASSIGNED</u>

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-02</u>

File ID: F080917.seq-68.0000.txt

Sampled: 07/31/17 07:35

Batch: B[H0982

Prepared: <u>08/09/17 12:00</u>

Analyzed: 08/10/17 13:08

Solids: <u>0.00</u>

Preparation: No Prep 1714391

EPA-314.0

Initial/Final: 20 ml / 20 ml

Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0

129217

Tidewater Inc. 3761 Attucks Drive

Powell, OH 43065

Reported: 8/25/2017 12:59:28PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-4-2

Laboratory: BC Laboratories

SDG: 17-20934

Client: Tidewater Inc. Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-03RE2</u>

File ID: F080917.seq-98.0000.txt

Sampled: 07/31/17 08:05

Batch: <u>B[H0982</u>

Prepared: 08/09/17 12:00

Analyzed: 08/10/17 20:49

Solids: <u>0.00</u>

Preparation: No Prep

1714391

Sequence:

Initial/Final: 20 ml / 20 ml Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	4.3	1		EPA-314.0

Reported: 8/25/2017 12:59:28PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-4-1

Laboratory: BC Laboratories

SDG: 17-20934

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Tidewater Inc.

3761 Attucks Drive Powell, OH 43065

Laboratory ID: <u>1720934-04</u>

File ID: F080917.seq-71.0000.txt

07/31/17 08:30 Sampled:

08/09/17 12:00 Prepared:

Analyzed: 08/10/17 13:50

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0982</u>

Sequence:

1714391

Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0

Reported: 8/25/2017 12:59:28PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-21-5

Laboratory: BC Laboratories

SDG: <u>17-20934</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: 1720934-05

File ID: F080917.seq-72.0000.txt

Sampled: 07/31/17 10:15

Prepared: 08/09/17 12:00

Analyzed: 08/10/17 14:03

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0982</u>

Sequence: <u>1714391</u>

Calibration: <u>UNASSIGNED</u>

Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.3	1	J	EPA-314.0

5692417

Reported: 8/25/2017 12:59:28PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-21-4

Laboratory: BC Laboratories

SDG: 17-20934

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: 1720934-06

File ID: F080917.seq-74.0000.txt

Sampled: 07/31/17 09:45

Prepared: <u>08/09/17 12:00</u>

Analyzed: 08/10/17 14:31

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0982

Sequence:

1714391

Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.3	1	J	EPA-314.0

Tidewater Inc.

3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 12:59:28PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-21-3

Laboratory:

BC Laboratories

SDG: 17-20934

Client:

Tidewater Inc.

Sequence:

Project: JPL-GW Monitoring Wells

Initial/Final: 20 ml / 20 ml

Matrix:

Water

Laboratory ID: <u>1720934-07</u>

File ID: F080917.seq-76.0000.txt

Sampled:

07/31/17 10:50

Prepared: 08/09/17 12:00

Analyzed: 08/10/17 14:59

Solids:

0.00

Batch: B[H0982

Preparation: No Prep 1714391

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

260311

Environmental Testing Laboratory Since 1949

Reported: 8/25/2017 12:59:28PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-21-2

Laboratory: BC Laboratories

SDG: 17-20934

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Tidewater Inc.

3761 Attucks Drive Powell, OH 43065

Laboratory ID: <u>1720934-08</u>

File ID: F080917.seq-83.0000.txt

07/31/17 11:30 Sampled:

08/09/17 12:00 Prepared:

Analyzed: 08/10/17 16:36

0.00 Solids:

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0982

Sequence:

1714391

Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	1.1	1	J	EPA-314.0

Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 12:59:28PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-21-1

Laboratory: BC Laboratories

SDG: 17-20934

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1720934-09</u>

File ID: F080917.seq-85.0000.txt

Sampled: 07/31/17 12:00

Prepared: 08/09/17 12:00

Analyzed: 08/10/17 17:03

Solids:

0.00

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0982</u>

Sequence: 1714391 Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	7.7	1		EPA-314.0

Reported: 8/25/2017 12:59:28PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-314.0**

EB-6-073117

Laboratory: BC Laboratories

SDG: 17-20934

Client:

Tidewater Inc.

Project: JPL-GW Monitoring Wells

File ID: F080917.seq-87.0000.txt

Matrix:

Water

Laboratory ID: <u>1720934-10</u>

Prepared: 08/09/17 12:00

Analyzed: 08/10/17 17:31

Sampled: <u>07/31/17 12:15</u>

1714391

Initial/Final: 20 ml / 20 ml

Batch: B[H0982

Solids: <u>0.00</u>

Preparation: No Prep

Sequence:

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.75	1	J	EPA-314.0

Sequence:

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 12:59:28PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

SB-2-073117

Laboratory: BC Laboratories

SDG: 17-20934

Calibration: UNASSIGNED

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-11</u>

File ID: F080917.seq-88.0000.txt

Sampled: 07/31/17 12:30

Batch: B[H0982

Prepared: 08/09/17 12:00

Analyzed: <u>08/10/17 17:45</u>

Solids: <u>0.00</u>

Preparation: No Prep 1714391

Initial/Final: 20 ml / 20 ml Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0

Mul

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065 Reported: 8/25/2017 12:59:28PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-4-3

Laboratory: BC Laboratories

SDG: <u>17-20934</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-02</u>

File ID: 170731 1957 CR6-035

Sampled: <u>07/31/17 07:35</u>

Prepared: 07/31/17 19:57

Analyzed: 07/31/17 20:15

Solids: <u>0.00</u>

Batch: <u>B[H0129</u>

Preparation: <u>No Prep</u>

<u>1713707</u>

Sequence:

Initial/Final: 20 ml / 20 ml

Calibration: <u>UNASSIGNED</u>

Instrument: KONE-1

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

H092117

Reported: 8/25/2017 12:59:28PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-4-2

Laboratory: BC Laboratories

SDG: <u>17-20934</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: 1720934-03

File ID: 170731 1957 CR6-036

Sampled: <u>07/31/17 08:05</u>

Prepared: 07/31/17 19:57

Analyzed: 07/31/17 20:15

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0129

Sequence: <u>17</u>

1713707

Calibration: UNASSIGNED

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

Reported: 8/25/2017 12:59:28PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-4-1

Laboratory: BC Laboratories

SDG: 17-20934

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-04</u>

File ID: <u>170731 1957 CR6-037</u>

Sampled: 07/31/17 08:30

Prepared: 07/31/17 19:57

Analyzed: 07/31/17 20:15

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0129</u>

Sequence:

1713707

Calibration: <u>UNASSIGNED</u>

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

Reported: 8/25/2017 12:59:28PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-21-5

Laboratory: BC Laboratories

SDG: 17-20934

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-05</u>

File ID: 170731 1957 CR6-038

Sampled: 07/31/17 10:15

Prepared: <u>07/31/17 19:57</u>

Analyzed: 07/31/17 20:15

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0129

1713707 Sequence:

Calibration: <u>UNASSIGNED</u>

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

Reported: 8/25/2017 12:59:28PM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-21-4

Laboratory: BC Laboratories

SDG: <u>17-20934</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-06</u>

File ID: 170731 1957 CR6-065

Sampled: <u>07/31/17 09:45</u>

Prepared: 07/31/17 19:57

Analyzed: 07/31/17 21:01

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0129</u>

Sequence: <u>1713707</u>

Calibration: UNASSIGNED

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

Reported: 8/25/2017 12:59:28PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-21-3

Laboratory: BC Laboratories

SDG: 17-20934

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-07</u>

File ID: 170731 1957 CR6-027

Sampled: 07/31/17 10:50

Prepared: 07/31/17 19:57

Analyzed: 07/31/17 19:57

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0129</u>

Sequence:

1713707

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

A42117

Sequence:

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/25/2017 12:59:28PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-7196**

MW-21-2

Laboratory: BC Laboratories

SDG: 17-20934

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water Laboratory ID: 1720934-08

File ID: 170731 1957 CR6-040

Sampled: 07/31/17 11:30

Prepared: <u>07/31/17 19:57</u>

Analyzed: 07/31/17 20:15

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0129

1713707

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

Augan

Reported: 8/25/2017 12:59:28PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-21-1

Laboratory: BC Laboratories

SDG: 17-20934

Client: <u>Tidewater Inc.</u>

Project: JPL- GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-09</u>

File ID: 170731 1957 CR6-074

Sampled: 07/31/17 12:00

Batch: B[H0129

Prepared: 07/31/17 19:57

Analyzed: 07/31/17 21:17

Solids: <u>0.00</u>

Preparation: No Prep

1713707

Sequence:

Initial/Final: 20 ml / 20 ml

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

827211

Reported: 8/25/2017 12:59:28PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

EB-6-073117

Laboratory: BC Laboratories

SDG: 17-20934

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1720934-10</u>

File ID: 170731 1957 CR6-042

Sampled: 07/31/17 12:15

Prepared: 07/31/17 19:57

Analyzed: 07/31/17 20:15

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0129

Sequence:

1713707

Calibration: UNASSIGNED

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



Reported: 8/25/2017 12:59:28PM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

SB-2-073117

Laboratory: BC Laboratories

SDG: <u>17-20934</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1720934-11</u>

File ID: 170731 1957 CR6-075

Sampled: 07/31/17 12:30

Prepared: 07/31/17 19:57

Analyzed: 07/31/17 21:17

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0129</u>

ce: <u>1713707</u>

Sequence:

Calibration: UNASSIGNED

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

VALIDATION COMPLETENESS WORKSHEET

SDG #: 17-20934 Laboratory: BC Laboratories, Inc.

LDC #: 39385B6

Level III/IV

Page: 1 of 1
Reviewer: V3
2nd Reviewer: VV

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
l.	Sample receipt/Technical holding times	A/A	
11	Initial calibration	A	
111.	Calibration verification	A	,
IV	Laboratory Blanks	A	
V	Field blanks	SW	EB=9, SB=10 *
VI.	Matrix Spike/Matrix Spike Duplicates	A	1
VII.	Duplicate sample analysis	<u> </u>	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Sample result verification	A	Not reviewed for Level III validation.
ΧI	Overall assessment of data	A	

Note:

A = Acceptable

N = Not provided/applicable

* ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

SW = See worksheet F
** Indicates sample was underwent Level IV review

	Client ID	Lab ID	Matrix	Date
1	MW-4-3	1720934-02	Water	07/31/17
2	MW-4-2	1720934-03	Water	07/31/17
3	MW-4-1	1720934-04	Water	07/31/17
4	MW-21-5	1720934-05	Water	07/31/17
5	MW-21-4	1720934-06	Water	07/31/17
3	MW-21-3	1720934-07	Water	07/31/17
7	MW-21-2**	1720934-08**	Water	07/31/17
8	MW-21-1	1720934-09	Water	07/31/17
9	EB-6-073117	1720934-10	Water	07/31/17
10	SB-2-073117	1720934-11	Water	07/31/17
11	MW-21-3MS	1720934-07MS	Water	07/31/17
12	MW-21-3MSD	1720934-07MSD	Water	07/31/17
13	MW-21-3DUP	1720934-07DUP	Water	07/31/17
14				
15				
16				

Notes:____

Page: 1_of_2 Reviewer: JB 2nd Reviewer: Kk

Method:Inorganics (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.				
II. Calibration				
Were all instruments calibrated daily, each set-up time?	V			
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.	1			
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) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 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?				

VALIDATION FINDINGS CHECKLIST

Page: 1_of_2 Reviewer: __JB 2nd Reviewer: __K

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.			7	
X. Field blanks				·
Field blanks were identified in this SDG.	1			
Target analytes were detected in the field blanks.				

.DC #: 39335B4

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:1	_	of_	_1_
Reviewer:		JB	
2nd reviewer:		V	1

All circled methods are applicable to each sample.

Sample ID	Parameter
1-10	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC (r6+) (104)
·	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
<u> </u>	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
11-13	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ AIK CN NH ₃ TKN TOC (Cr6+) CIO ₄)
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ AIK CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CLF NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
·	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	ph TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	ph TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	ph TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	ph TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	ph TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CLE NO, NO, SO, O-PO, Alk CN NH, TKN TOC Cr6+ ClO.

Comments:	_

LDC #: 3938586 SDG #: 17-74934

VALIDATION FINDINGS WORKSHEET Field Blanks

Page: of l

Reviewer: 2nd reviewer:

N N/A	Were field blanks identified Were target analytes detec		
ample:	9 Field Blar	nk / Trip Blank / Rinsate / Other	(circle one)
		Analyte	Concentration Units (४९)
	С	104	
	·		
			,
ample:	Field Blar	nk / Trip Blank / Rinsate / Other	(circle one)
		Analyte	Concentration Units ()

网络到 中心 生生

LDC #: 39395By

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page: <i>!</i>	_ of	_1_	
Reviewer:		13	
2nd Review	ver: \	W	_

Method: Inorganics, Method	See Cover
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The correlation coefficient (r) for the calibration of $\frac{C \log w}{2}$ was recalculated. Calibration date: 8 / 1 / 12

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

%R = <u>Found X 100</u>

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

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (ug/L)	Area	r or r ²	r or r ²	(Y/N)
Initial calibration		s1	0	0.0001			
		s2	2	0.0024	99.9421%	99.9141%	
	Cloy-	s3	4	0.0044			
	८ १७५	s4	6	0.007			γ
		s5	10	0.0119			
		s6	20	0.0243			
	0		found:	TRUE!	_		
Calibration verification	Cru+	Icv	0.0498 mg/L	_0.050000 mg/L	1007.	1017	Y
Calibration verification	C 1044	GGA	FOUND;	TRUE: 10.000491L	91.4%	93.9%	Y
				0			
Calibration verification		E			****		

Comments: Refer to Calibration Verification findings worksheet for list of qualifications an	nd associated samples when reported results do not agree withir
10.0% of the recalculated results	

LDC #: 39385B4

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page:_	1	_of_	1	_
Reviewer:		JB	_	_
2nd Reviewe	er: <u>°</u>	W		_

METHOD: Inorganics, Method	Sec Cover
3 ,	

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

 $%R = Found \times 100$

Where,

Found =

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,

True 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:

 $RPD = |S-D| \times 100$

Where,

S =

Original sample concentration

(S+D)/2

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	C 104	9.9443 mg/L	10.0004911	99.77.	97.27.	4
ms	Matrix spike sample	Cr6+	0.0498 = 0.05242 mg/L	0.052632mg/L	99.67.	99.473	Y
wsD	Duplicate sample	Cr6+	tound: 0.05242mg/L	FOUND: 0.05242mg/L	07 270	0.08667.237	У

Comments:			

LDC#: 39385B4

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: <u>1</u>	of1
Reviewer:	JB
nd reviewer:	KK

				2nd review	wer: KK
METH	IOD: Inorganics, Metho	od See Cover			
Y N Y N Y N Comp	N/A Have results was Are all detection ound (analyte) results	ow for all questions answered "N". Not approper been reported and calculated correctly? within the calibrated range of the instrumention limits below the CRQL? for	ts?	e identified as "N/ orted with a positi	
	tration =	Recalculation:			
	y = mx + b y = 0.001 m = 0.0012.03 $b = 4.7 E^{-1}6$	C104 =	0.001 - 4.75	- 0.8	3269 mg (L
#	Sample ID	Analyte	Reported Concentration	Calculated Concentration (uq L_)	Acceptable (Y/N)
	7	Clo4	1.1	o∵ 8.3	Y

Note:		

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 21, 2017

Parameters:

Volatiles

Validation Level:

Level III

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-21317

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
			
TB-8-080217	1721317-01	Water	08/02/17
MVV-13	1721317-02	Water	08/02/17
DUP-6-3Q17	1721317-03	Water	08/02/17
MW-6	1721317-04	Water	08/02/17
DUP-7-3Q17	1721317-05	Water	08/02/17
MW-5	1721317-06	Water	08/02/17
MVV-8	1721317-08	Water	08/02/17
EB-8-080217	1721317-09	Water	08/02/17
MW-8MS	1721317-08MS	Water	08/02/17
MW-8MSD	1721317-08MSD	Water	08/02/17

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 nonconformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r²) were greater than or equal to 0.990.

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/07/17	Methyl iodide Pentachloroethane	52.3 (≤30) 32.8 (≤30)	TB-8-080217 MW-13 DUP-6-3Q17 MW-8	UJ (all non-detects) UJ (all non-detects)	Р
08/08/17	Bromomethane Methyl iodide Pentachloroethane	32.6 (≤30) 52.1 (≤30) 36.2 (≤30)	MW-6 DUP-7-3Q17 MW-5 EB-8-080217	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	P

V. Laboratory Blanks

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

VI. Field Blanks

Sample TB-8-080217 was identified as a trip blank. No contaminants were found.

Sample EB-8-080217 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

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

X. Field Duplicates

Samples MW-13 and DUP-6-3Q17 and samples MW-6 and DUP-73Q17 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentr	·	
Compound	MW-13	DUP-6-3Q17	RPD (Limits)
Carbon tetrachloride	0.28	0.27	4
Chloroform	2.9	2.8	4
Tetrachloroethene	0.23	0.28	20
Trichloroethene	0.31	0.31	0

	Concentr		
Compound	MW-6	DUP-7-3Q17	RPD (Limits)
Chloroform	0.48	0.50	4
Tetrachloroethene	0.57	0.49	15
Trichloroethene	2.6	2.7	4

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

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

Due to continuing calibration %D, data were qualified as estimated in eight samples.

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

NASA JPL, 2Q2017 Volatiles - Data Qualification Summary - SDG 17-21317

Sample	Compound	Flag	A or P	Reason
TB-8-080217 MW-13 DUP-6-3Q17 MW-8	Methyl iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects)	Р	Continuing calibration (%D)
MW-6 DUP-7-3Q17 MW-5 EB-8-080217	Bromomethane Methyl iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	Р	Continuing calibration (%D)

NASA JPL, 2Q2017 Volatiles - Laboratory Blank Data Qualification Summary - SDG 17-21317

No Sample Data Qualified in this SDG



Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-8-080217

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-01

File ID:

07AUG14.D

Sampled:

08/02/17 07:00

Prepared:

08/07/17 09:48

Analyzed:

08/07/17 16:57

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1 .	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-8-080217

Laboratory:

BC Laboratories

SDG:

<u>17-21317</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-01

File ID:

07AUG14.D

Sampled:

08/02/17 07:00

Prepared:

08/07/17 09:48

Analyzed:

08/07/17 16:57

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0652 Sequence: 1713910	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U-
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	. 1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	11	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	11	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-8-080217

MS-V5

U

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-01

File ID:

07AUG14.D

Sampled:

08/02/17 07:00

o-Xylene

Prepared:

08/07/17 09:48

Analyzed:

08/07/17 16:57

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

B[H0652 1713910 Calibration: 1708011 Instrument: Batch: Sequence: COMPOUND **DILUTION** CONC. (ug/L) CAS NO. 0.48 Carbon disulfide 75-15-0 trans-1,4-Dichloro-2-butene 1 110-57-6 1.8

Q U U Diethyl ether U 1 0.33 60-29-7 U Ethyl methacrylate 1 1.3 97-63-2 Ethyl t-butyl ether 1 0.32 U 637-92-3 U Hexachloroethane 1 0.11 67-72-1 2-Hexanone 1 5.0 U 591-78-6 Methacrylonitrile 1 2.3 U 126-98-7 Methyl ethyl ketone 1 3.3 U 78-93-3 Methyl iodide 1 1.1 UL 74-88-4 U Methyl isobutyl ketone 1 2.4 108-10-1 U Methyl methacrylate 1 1.2 80-62-6 U UT Pentachloroethane 1 0.63 76-01-7 1 6.2 U Propionitrile 107-12-0 Tetrahydrofuran 1 5.2 U 109-99-9 0.34 U p- & m-Xylenes 1 179601-23-1

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.4700	94.7	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7300	97.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7600	97.6	80 - 120	

1

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	231884	6.58	239780	6.57	
Chlorobenzene-d5 (IS)	92539	9.61	97357	9.62	
1,4-Difluorobenzene (IS)	349804	7.38	364372	7.38	

^{*} Values outside of QC limits

95-47-6

0.13



Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET **EPA-524.2**

TB-8-080217

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-01

File ID:

07AUG14.D

Sampled:

08/02/17 07:00

Prepared:

08/07/17 09:48

Analyzed:

08/07/17 16:57

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0652	Sequence:	<u>1713910</u>	Calibration:	1708011	Instrument:	MS-V5
CAS NO.	COMPOUND)		DILUTION	C	ONC. (ug/L)	Q
107-14-2	Chloroacetoni	trile		1			U
109-69-3	1-Chlorobutan	ne		1			U
513-88-2	1,1-Dichlorop	ropanone		1			U
96-33-3	Methyl acrylat	te		1			U
98-95-3	Nitrobenzene			1			U
79-46-9	2-Nitropropan	e		1			U

^{*} Values outside of QC limits

Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-13

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721317-02</u>

File ID:

07AUG15.D

Sampled:

08/02/17 08:50

Prepared:

08/07/17 09:48

Analyzed:

08/07/17 17:20

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Solids:	rieparation. <u>DIA 3</u>	OJO Water WIS	ilitiat/Filiai. 25 iii/ 25 iii	
Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1 .	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U.
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U U
56-23-5	Carbon tetrachloride	1	0.28	J
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	2.9	
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1 .	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U



Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-13

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-02

File ID:

07AUG15.D

Sampled:

08/02/17 08:50

Prepared:

08/07/17 09:48

Analyzed:

08/07/17 17:20

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	. U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	- 1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	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	0.17	Ū
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	Ū
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.31	J
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U .
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-13

Laboratory:

BC Laboratories

SDG:

17-21317

JPL- GW Monitoring Wells

Client: Matrix: Tidewater Inc.

Laboratory ID:

Project:

File ID:

07AUG15.D

Sampled:

<u>Water</u> 08/02/17 08:50

Prepared:

1721317-02 08/07/17 09:48

Analyzed:

08/07/17 17:20

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	Ū
97-63-2	Ethyl methacrylate	1	1.3	Ŭ
637-92-3	Ethyl t-butyl ether	1	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	Ū
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	, U
74-88-4	Methyl iodide	1	1.1	ע עס
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	1	0.63	UWJ
107-12-0	Propionitrile	1	6.2	Ū
109-99-9	Tetrahydrofuran	1	5.2	Ū
179601-23-1	p- & m-Xylenes	1	. 0.34	Ū
95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.9700	99.7	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9700	99.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6800	96.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	221801	6.57	239780	6.57	
Chlorobenzene-d5 (IS)	88784	9.62	97357	9.62	
1,4-Difluorobenzene (IS)	339157	7.38	364372	7.38	

^{*} Values outside of QC limits

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-13

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-02

File ID:

07AUG15.D

Sampled:

08/02/17 08:50

Prepared:

08/07/17 09:48

Analyzed:

08/07/17 17:20

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0652	Sequence:	<u>1713910</u>	Calibration:	<u>1708011</u>	Instrument:	MS-V5	
CAS NO.	COMPOUND			DILUTION	С	ONC. (ug/L)	Q	
107-14-2	Chloroacetoni	trile		1			U	
109-69-3	1-Chlorobutan	ıe		1			U	
513-88-2	1,1-Dichlorop	ropanone		1			U	
96-33-3	Methyl acrylat	te '		1			U	
98-95-3	Nitrobenzene			1			U	
79-46-9	2-Nitropropan	e		1			U	

^{*} Values outside of QC limits

Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-6-3Q17

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

1721317-03

File ID:

07AUG16.D

Sampled:

08/02/17 09:00

Prepared:

08/07/17 09:48

Analyzed:

08/07/17 17:43

Solids:

Preparation:

Laboratory ID:

EPA 5030 Water MS

Initial/Final:

atch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	1708011 Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.27	J
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	. 1	2.8	
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	. 1	0.18	U

Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-6-3Q17

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-03

File ID:

07AUG16.D

Sampled:

08/02/17 09:00

Prepared:

08/07/17 09:48

Analyzed:

08/07/17 17:43

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U-
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.28	J
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.31	J
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1 .	9.4	U

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-6-3Q17

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Huewater III

Water

<u>1721317-03</u>

File ID:

07AUG16.D

Sampled:

08/02/17 09:00

Prepared:

Laboratory ID:

08/07/17 09:48

Analyzed:

08/07/17 17:43

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	1	1.1	UVT
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	11	0.63	U 10
107-12-0	Propionitrile	1	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.34	U
95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.5000	95.0	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7800	97.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6800	96.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	223060	6.57	239780	6.57	
Chlorobenzene-d5 (IS)	88076	9.62	97357	9.62	
1,4-Difluorobenzene (IS)	336925	7.38	364372	7.38	!

^{*} Values outside of QC limits

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-6-3Q17

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

17-21317

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721317-03</u>

File ID:

07AUG16.D

Sampled:

08/02/17 09:00

Prepared:

08/07/17 09:48

Analyzed:

08/07/17 17:43

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0652	Sequence:	<u>1713910</u>	Calibration:	<u>1708011</u>	Instrument:	MS-V5	
CAS NO.	COMPOUND)		DILUTION	CC	ONC. (ug/L)	Q	
107-14-2	Chloroacetoni	trile		1			U	
109-69-3	1-Chlorobutan	ne		1			.U	
513-88-2	1,1-Dichlorop	ropanone		1			U	
96-33-3	Methyl acrylat	te		1			U	
98-95-3	Nitrobenzene			1			U	
79-46-9	2-Nitropropan	ie		1			U	

^{*} Values outside of QC limits

Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-6

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID: 1

1721317-04

File ID:

07AUG40.D

Sampled:

08/02/17 09:50

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 02:55

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U.
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	UUT
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.48	J
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

1092417



Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-6

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-04 08/07/17 09:48 File ID: Analyzed: 07AUG40.D 08/08/17 02:55

Sampled:

08/02/17 09:50

Prepared: Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Solids: Datah

Instrument

Batch:	B[H0652 Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	'U'
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.57	
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	2.6	
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-6

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID: <u>1721317-04</u>

.

File ID:

07AUG40.D

Sampled:

08/02/17 09:50

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 02:55

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0652 Sequence: 1713910	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	1	1.1	UUS
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	1	0.63	UU
107-12-0	Propionitrile	11	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	11	0.34	U
95-47-6	o-Xylene	11	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.160	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8400	98.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3600	93.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	190606	6.57	194267	6.58	
Chlorobenzene-d5 (IS)	77660	9.61	74707	9.62	
1,4-Difluorobenzene (IS)	283916	7.38	288644	7.38	

^{*} Values outside of QC limits

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-6

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

1 idewater in

Water

1721317-04

File ID:

07AUG40.D

Sampled:

08/02/17 09:50

Prepared:

Laboratory ID:

08/07/17 09:48

Analyzed:

08/08/17 02:55

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
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

^{*} Values outside of QC limits

Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-7-3Q17

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Laboratory ID:

1721317-05

File ID:

07AUG41.D

Sampled:

Water 08/02/17 10:00

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 03:18

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

atch:	B[H0652 Sequence: <u>1713910</u>	Calibration:	1708011 Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	לא ט
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.50	
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	. 1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U



Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-7-3Q17

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID: 1721317-05 File ID:

07AUG41.D

Sampled:

08/02/17 10:00

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 03:18

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	Ū
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.49	J
108-88-3	Toluene	1 .	0.17	Ū
87-61-6	1,2,3-Trichlorobenzene	1	0.19	Ū
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	2.7	
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	Ū
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-7-3Q17

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

1140 114101 1111

Water

Laboratory ID: <u>1721317-05</u>

110,000

File ID:

07AUG41.D

Sampled:

08/02/17 10:00

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 03:18

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	1	1.1	U中
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	1	0.63	UVJ
107-12-0	Propionitrile	1	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.34	U
95-47-6	o-Xylene	1	0.13	U
				

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.300	103	75 - 125	
Toluene-d8 (Surrogate)	. 10.000	10.230	102	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6900	96.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	201103	6.57	194267	6.58	
Chlorobenzene-d5 (IS)	80695	9.61	74707	9.62	
1,4-Difluorobenzene (IS)	288704	7.38	288644	7.38	

^{*} Values outside of QC limits

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-7-3Q17

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-05

File ID:

07AUG41.D

Sampled:

08/02/17 10:00

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 03:18

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	B[H0652 Seque	nce:	<u>1713910</u>	Calibration:	<u>1708011</u>	Instrument:	<u>MS-V5</u>	
CAS NO.	COMPOUND			DILUTION	С	ONC. (ug/L)	Q	
107-14-2	Chloroacetonitrile			1		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	

^{*} Values outside of QC limits

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-5

Laboratory:

BC Laboratories

SDG:

<u>17-21317</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721317-06</u>

File ID:

07AUG42.D

Sampled:

08/02/17 11:01

Prepared:

08/07/17 07:00

Analyzed:

08/08/17 03:41

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0523</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	UU
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

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Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-5

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-06

File ID:

07AUG42.D

Sampled:

08/02/17 11:01

Prepared:

08/07/17 07:00

Analyzed:

08/08/17 03:41

Solids:		Preparation:	EPA 5030 Water MS	Initial/Final: 25 ml / 25 ml	
Batch:	B[H0523 Sequence	ce: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND		DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene		1	0.19	U
10061-01-5	cis-1,3-Dichloropropene		1	0.14	U
10061-02-6	trans-1,3-Dichloropropene		1	0.13	U .
100-41-4	Ethylbenzene		1	0.15	U
87-68-3	Hexachlorobutadiene	·	1	0.20	U
98-82-8	Isopropylbenzene		1	0.14	U
99-87-6	p-Isopropyltoluene		1	0.14	U
75-09-2	Methylene chloride		1	0.21	U
1634-04-4	Methyl t-butyl ether		1	0.14	Ŭ
91-20-3	Naphthalene		1	0.16	U
103-65-1	n-Propylbenzene		1	0.12	U
100-42-5	Styrene		1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane		1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane		1	0.17	U
127-18-4	Tetrachloroethene		1	0.23	U
108-88-3	Toluene		1	0.17	U
87-61-6	1,2,3-Trichlorobenzene		1	0.19	U
120-82-1	1,2,4-Trichlorobenzene		1	0.15	U
71-55-6	1,1,1-Trichloroethane		1	0.21	U
79-00-5	1,1,2-Trichloroethane		1	0.21	U
79-01-6	Trichloroethene		1	0.19	U
75-69-4	Trichlorofluoromethane		1	0.14	U
96-18-4	1,2,3-Trichloropropane		1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-triflu	oroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene		1	0.17	U
108-67-8	1,3,5-Trimethylbenzene		1	0.14	U
75-01-4	Vinyl chloride		1	0.18	U
67-64-1	Acetone		1	6.6	U
107-13-1	Acrylonitrile		1	1.5	U
107-05-1	Allyl chloride		1	0.47	U
994-05-8	t-Amyl Methyl ether		1	0.19	U
75-65-0	t-Butyl alcohol		1	9.4	U



Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-5

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-06

File ID:

07AUG42.D

Sampled:

08/02/17 11:01

Prepared:

08/07/17 07:00

Analyzed:

08/08/17 03:41

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0523	Sequence:	<u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND			DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfic	le		1	0.48	U
110-57-6	trans-1,4-Dichl	loro-2-butene		1	1.8	U
60-29-7	Diethyl ether			1	0.33	U
97-63-2	Ethyl methacry	late		1	1.3	U
637-92-3	Ethyl t-butyl et	ther		1	0.32	U
67-72-1	Hexachloroetha	ane		1	0.11	U
591-78-6	2-Hexanone			1	5.0	U
126-98-7	Methacrylonitr	ile		1	2.3	U
78-93-3	Methyl ethyl ke	etone		1	3.3	U
74-88-4	Methyl iodide			1	1.1	ひり
108-10-1	Methyl isobuty	l ketone		1	2.4	U
80-62-6	Methyl methac	rylate		1	1.2	U
76-01-7	Pentachloroeth	ane		1	0.63	UU
107-12-0	Propionitrile			1	6.2	U
109-99-9	Tetrahydrofura	ın		1	5.2	U
179601-23-1	p- & m-Xylene	s		1	0.34	U
95-47-6	o-Xylene			1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.500	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6600	96.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9600	99.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	187312	6.57	194267	6.58	
Chlorobenzene-d5 (IS)	71675	9.62	74707	9.62	
1,4-Difluorobenzene (IS)	276661	7.38	288644	7.38	

^{*} Values outside of QC limits



Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-5

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

D • .

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

Project:

File ID:

07AUG42.D

Sampled:

08/02/17 11:01

Prepared:

1721317-06 08/07/17 07:00

Analyzed:

08/08/17 03:41

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0523</u> Sequence: <u>1713910</u>	Calibration: 17	708011 Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
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

^{*} Values outside of QC limits

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-8

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

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JPL- GW Monitoring Wells

Matrix:

Tidewater Inc.

Project:

File ID:

07AUG07.D

Sampled:

<u>Water</u> 08/02/17 13:01 Laboratory ID: Prepared:

Preparation:

1721317-08 08/07/17 07:00

Analyzed:

08/07/17 14:16

Solids:

EPA 5030 Water MS

Initial/Final:

Solius.		750 Water 1715	initial/i mai.	
Batch:	B[H0523 Sequence: 1713910	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	Ū.
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	. 1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	Ü
594-20-7	2,2-Dichloropropane	1	0.18	U
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Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-8

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721317-08</u>

File ID:

07AUG07.D

Sampled:

08/02/17 13:01

Prepared:

08/07/17 07:00

Analyzed:

08/07/17 14:16

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0523</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	Ū
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	. 1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	11	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	J
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

805/2117

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-8

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721317-08</u>

File ID:

07AUG07.D

Sampled:

08/02/17 13:01

Prepared:

08/07/17 07:00

Analyzed:

08/07/17 14:16

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0523</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	1	1.1	UUT
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	1	0.63	ひり
107-12-0	Propionitrile	1	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	. 1	0.34	U
95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	8.9400	89.4	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.6800	96.8	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7400	97.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	232617	6.57	239780	6.57	
Chlorobenzene-d5 (IS)	91169	9.62	97357	9.62	
1,4-Difluorobenzene (IS)	348181	7.38	364372	7.38	

^{*} Values outside of QC limits



Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-8

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-08

File ID:

07AUG07.D

Sampled:

08/02/17 13:01

Prepared:

08/07/17 07:00

Analyzed:

08/07/17 14:16

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0523	Sequence:	<u>1713910</u>	Calibration:	1708011	Instrument:	MS-V5
CAS NO.	COMPOUND			DILUTION	CC	ONC. (ug/L)	Q
107-14-2	Chloroacetoni	trile		1			U
109-69-3	1-Chlorobutan	e		1			U
513-88-2	1,1-Dichlorop	ropanone		1			U
96-33-3	Methyl acrylat	te	.:	1			U
98-95-3	Nitrobenzene			1			U
79-46-9	2-Nitropropan	е	:	1			U

^{*} Values outside of QC limits

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-8-080217

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-09

File ID:

07AUG43.D

Sampled:

08/02/17 13:15

Prepared:

08/07/17 07:00

Analyzed:

08/08/17 04:04

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0523</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	· U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	UW
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	Ū
75-34-3	1,1-Dichloroethane	11	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	11	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

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Environmental Testing Lab
Tidewater Inc.

Reported: 8/30/2017 10:31:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-8-080217

Laboratory:

3761 Attucks Drive Powell, OH 43065

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-09

File ID:

07AUG43.D

Sampled:

08/02/17 13:15

Prepared:

08/07/17 07:00

Analyzed:

08/08/17 04:04

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0523</u> Sequence: <u>1713910</u>	Calibration:	1708011 Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	-1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-8-080217

Laboratory:

BC Laboratories

SDG:

<u>17-21317</u>.

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721317-09

File ID:

07AUG43.D

Sampled:

08/02/17 13:15

Prepared:

08/07/17 07:00

Analyzed:

08/08/17 04:04

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0523</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	11	0.32	U
67-72-1	Hexachloroethane	- 1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	11	1.1	UNT
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	11	0.63	UUJ
107-12-0	Propionitrile	11	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	11	0.34	U
95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.180	102	75 - 125	· · · · · · · · · · · · · · · · · · ·
Toluene-d8 (Surrogate)	10.000	9.8400	98.4	80 - 120	_
4-Bromofluorobenzene (Surrogate)	10.000	9.8600	98.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	191839	6.58	194267	6.58	
Chlorobenzene-d5 (IS)	74543	9.61	74707	9.62	
1,4-Difluorobenzene (IS)	287431	7.38	288644	7.38	

^{*} Values outside of QC limits



Reported: 8/30/2017 10:31:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET **EPA-524.2**

EB-8-080217

Laboratory:

BC Laboratories

SDG:

17-21317

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

1721317-09

File ID:

07AUG43.D

Sampled:

08/02/17 13:15

Water

Prepared:

Laboratory ID:

08/07/17 07:00

Analyzed:

08/08/17 04:04

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0523	Sequence:	<u>1713910</u>	Calibration:	<u>1708011</u>	Instrument:	MS-V5
CAS NO.	COMPOUND)		DILUTION	CC	NC. (ug/L)	Q
107-14-2	Chloroacetoni	trile		1			U
109-69-3	1-Chlorobutar	ne		1			U
513-88-2	1,1-Dichlorop	ropanone		1			U
96-33-3	Methyl acryla	te		1			U
98-95-3	Nitrobenzene			1			U
79-46-9	2-Nitropropan	e		1			U

^{*} Values outside of QC limits

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L	.DC	#.	39300C I	

VALIDATION COMPLETENESS WORKSHEET

Level III

SDG #: 17-21317 Laboratory: BC Laboratories, Inc.

2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
<u>l.</u>	Sample receipt/Technical holding times	1	
II.	GC/MS Instrument performance check	A	
Ш.	Initial calibration/ICV	AA	(C) < 20/0. Y 2 /CV = 390
IV.	Continuing calibration	av	CCV < 300
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB=1. 23=8
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	→	105
X.	Field duplicates	W	D=2+3. 4+5
XI.	Internal standards	-8	
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	I oh ID	Matrix	Data
	Client ID	Lab ID	Matrix	Date
1	TB-8-080217	1721317-01	Water	08/02/17
2 ,	MW-13	1721317-02	Water	08/02/17
3	DUP-6-3Q17	1721317-03	Water	08/02/17
4 1	MW-6	1721317-04	Water	08/02/17
5	DUP-7-3Q17	1721317-05	Water	08/02/17
6 7	MW-5	1721317-06	Water	08/02/17
7	MW-8	1721317-08	Water	08/02/17
8)	EB-8-080217	1721317-09	Water	08/02/17
9	MW-8MS	1721317-08MS	Water	08/02/17
10	MW-8MSD	1721317-08MSD	Water	08/02/17
11				
12				
13		·		

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-lsopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. lodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT Methylcyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 39385C

VALIDATION FINDINGS WORKSHEET <u>Continuing Calibration</u>

Page: _/ of _/
Reviewer: ______
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".

Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Y(N)N/A Were all percent differences (%D) \leq 30%?

	TTOTE GIL PO	Territ differences (%D) < 3	70 70 :			
#	Date	Standard ID	Compound	Finding %D (Limit: <u>≤</u> 30.0%)	Associated Samples	Qualifications
	8/7/17	07AUG03	Methyliadide	<i>5</i> ≈.3	1-3.7.9-10.	-JAHA
	7.7.		Methyliadide	32.8	MB (ND)	717
	8/8/17	07AU433	B	32.6	4-6.8.MB (NO)	JANA
	77		Marly indide	32.6 52./ 36.2	(NO)	7 1
			Meshyl radiale	36.2		
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VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page:__of_/ Reviewer:____ 2nd Reviewer:____

METHOD: GCMS VOA (EPA Method 524.2)

		Concentrat		
	Compound	2	3	RPD
0		0.28	0.27	4
К		2.9	2.8	4
AA		0.23	0.28	20
s		0.31	0.31	0

	Concentrat	200	
Compound	4	5	RPD
К	0.48	0.50	4
AA	0.57	0.49	15
S	2.6	2.7	4

V:\FIELD DUPLICATES\Field Duplicates\FD_Organics\2017\39385C1_JPL.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 21, 2017

Parameters:

Chromium

Validation Level:

Level III

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-21317

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-13	1721317-02	Water	08/02/17
DUP-6-3Q17	1721317-03	Water	08/02/17
MW-6	1721317-04	Water	08/02/17
DUP-7-3Q17	1721317-05	Water	08/02/17
MW-5	1721317-06	Water	08/02/17
MW-15	1721317-07	Water	08/02/17
MW-8	1721317-08	Water	08/02/17
EB-8-080217	1721317-09	Water	08/02/17
MW-15MS	1721317-07MS	Water	08/02/17
MW-15MSD	1721317-07MSD	Water	08/02/17
MW-15DUP	1721317-07DUP	Water	08/02/17

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chromium by Environmental Protection Agency (EPA) Method 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

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

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

IV. ICP Interference Check Sample Analysis

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

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium	0.52500 ug/L	All samples in SDG 17-21317

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	1.2 ug/L	1.2U ug/L
MW-8	Chromium	1.9 ug/L	1.9U ug/L
EB-8-080217	Chromium	1.1 ug/L	1.1U ug/L

VI. Field Blanks

Sample EB-8-080217 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
EB-8-080217	Chromium	1.1 ug/L

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

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

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

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

XI. Field Duplicates

Samples MW-13 and DUP-6-3Q17 and samples MW-6 and DUP-7-3Q17 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Conce		Concentration (ug/L)	
Analyte	MW-13	DUP-6-3Q17	RPD
Chromium	1300	680	63

	Concentr		
Analyte	MW-6	DUP-7-3Q17	RPD
Chromium	30	120	120

XII. Internal Standards (ICP-MS)

Raw data were not reviewed for Level III validation.

XIII. Sample Result Verification

Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

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

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

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NASA JPL, 3Q2017 Metals - Data Qualification Summary - SDG 17-21317

No Sample Data Qualified in this SDG

NASA JPL, 3Q2017 Metals - Laboratory Blank Data Qualification Summary - SDG 17-21317

Sample	Analyte	Modified Final Concentration	A or P
MW-5	Chromium	1.2U ug/L	А
MW-8	Chromium	1.9U ug/L	А
EB-8-080217	Chromium	1.1U ug/L	А

Reported: 8/30/2017 10:37:01AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-13

BC Laboratories Laboratory:

SDG: 17-21317

Client: <u>Tidewater Inc.</u>

Project: JPL- GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-02</u>

File ID: PE-EL3 170808-214

Sampled:

08/02/17 08:50

Prepared: 08/04/17 09:00

Analyzed: 08/09/17 02:19

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0425</u>

Sequence:

1714081

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1300	1		EPA-200.8

Reported: 8/30/2017 10:37:01AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

SDG: <u>17-21317</u>

Calibration: <u>UNASSIGNED</u>

INORGANIC ANALYSIS DATA SHEET EPA-200.8

DUP-6-3Q17

BC Laboratories Laboratory:

Tidewater Inc.

Sequence:

Laboratory ID: <u>1721317-03</u>

Project: JPL-GW Monitoring Wells

File ID: PE-EL3_170808-215

08/02/17 09:00 Sampled:

Batch: <u>B[H0425</u>

Prepared: 08/04/17 09:00

Analyzed: 08/09/17 02:23

Solids:

Client: Matrix:

0.00

Water

Preparation: EPA 200.2 1714081

Initial/Final: 50 ml / 50 ml

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	680	1		EPA-200.8

Reported: 8/30/2017 10:37:01AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-6

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-04</u>

File ID: <u>PE-EL3 170808-216</u>

Sampled: 08/02/17 09:50

Prepared: 08/04/17 09:00

Analyzed: 08/09/17 02:26

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: B[H0425

Sequence:

1714081

Calibration: <u>UNASSIGNED</u>

Instrument: PE-EL3

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	30	1		EPA-200.8

7609-117

Reported: 8/30/2017 10:37:01AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

DUP-7-3Q17

Laboratory: BC Laboratories SDG: 17-21317

Client: Tidewater Inc. Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1721317-05</u>

File ID: PE-EL3 170808-217

08/02/17 10:00 Sampled:

Prepared: 08/04/17 09:00

Analyzed: 08/09/17 02:30

Solids: 0.00 Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0425</u>

1714081 Sequence:

Calibration: UNASSIGNED

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

Reported: 8/30/2017 10:37:01AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-5

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-06</u>

File ID: <u>PE-EL3 170808-218</u>

Sampled: 08/02/17 11:01

Prepared: 08/04/17 09:00

Analyzed: 08/09/17 02:33

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: B[H0425

Sequence: <u>1714081</u>

Calibration: UNASSIGNED

SIGNED Instrument: PE-EL3

CAS NO.	Analyte	Concentration (ug/L)		Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.2	u	1	J	EPA-200.8

Reported: 8/30/2017 10:37:01AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-15

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Calibration: <u>UNASSIGNED</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-07</u>

File ID: PE-EL3 170808-204

Sampled: 08/02/17 11:50

Batch: B[H0425

Prepared: 08/04/17 09:00

Analyzed: 08/09/17 01:45

Solids: <u>0.00</u>

Preparation: EPA 200.2

1714081

Sequence:

Initial/Final: 50 ml / 50 ml

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	5.9	1		EPA-200.8

Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/30/2017 10:37:01AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-8

Laboratory: BC Laboratories

SDG: 17-21317

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-08</u>

File ID: PE-EL3 170808-219

08/02/17 13:01 Sampled:

Prepared: 08/04/17 09:00

Analyzed: 08/09/17 02:37

Solids: 0.00 Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: B[H0425

Sequence:

1714081

Calibration: <u>UNASSIGNED</u>

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

Reported: 8/30/2017 10:37:01AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

EB-8-080217

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-09</u>

File ID: PE-EL3_170808-220

08/02/17 13:15 Sampled:

Prepared: 08/04/17 09:00

Analyzed: 08/09/17 02:40

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: B[H0425

Sequence: 1714081

Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	1.1 U	1	J	EPA-200.8

VALIDATION COMPLETENESS WORKSHEET

SDG #: 17-21317 Laboratory: BC Laboratories, Inc.

39385C4a

LDC #:

Level III

Date: 91/31+7 Page: cof 1 Reviewer:_ 2nd Reviewer:

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
l.	Sample receipt/Technical holding times	A/A	
Н.	ICP/MS Tune	A	
111.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not Require 1
V.	Laboratory Blanks	5W	0
VI.	Field Blanks	SW	EB-8
VII.	Matrix Spike/Matrix Spike Duplicates	A	·
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	N	Not performed
X	Laboratory control samples	A	Les
XI.	Field Duplicates	SW	(1,2) (3,4)
XII.	Internal Standard (ICP-MS)	N	Not Reviewed for level 111
XIII.	Sample Result Verification	N	V
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-13	1721317-02	Water	08/02/17
2	DUP-6-3Q17	1721317-03	Water	08/02/17
3	MW-6	1721317-04	Water	08/02/17
4	DUP-7-3Q17	1721317-05	Water	08/02/17
5	MW-5	1721317-06	Water	08/02/17
6	MW-15	1721317-07	Water	08/02/17
7	MW-8	1721317-08	Water	08/02/17
8	EB-8-080217	1721317-09	Water	08/02/17
9	MW-15MS	1721317-07MS	Water	08/02/17
10	MW-15MSD	1721317-07MSD	Water	08/02/17
11_	MW-15DUP	1721317-07DUP	Water	08/02/17
12				
13				
14				

Notes:

	LDC #:	39385C4a
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VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Page:1	of_	<u>1</u>	_
Reviewer:	JB		
2nd Reviewer	TAN		

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: __ug/L___

Soil preparation factor applied: NA
Associated Samples: All

				a,	ngul kasarin			are e		1000	
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (mg/L)	Action Level	5	7	8				
Cr		0.52500		2.625	1.2	1.9	1.1				
						* N.					

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 #: 39385C4a SDG #: 17-2-1317

VALIDATION FINDINGS WORKSHEET Field Blanks

Page: / of / Reviewer: // 2nd reviewer: //

METHOD: Tr	race Metals (E	PA CLP SOW ILM02.1)	
Y N N/A Y N N/A		blanks identified in this SDG? et analytes detected in the field blanks?	
Sample:	8	Field Blank / Trip Blank / Rinsate / Other(cir	cle one)
		Analyte	Concentration Units (<i>U</i> 9 1 '-)
		(r	1:1
			-
Sample:		Field Blank / Trip Blank / Rinsate / Other(circle one)
		Analyte	Concentration Units (
L			

LDC#: 39385C4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:	of_ <i>_</i> _
Reviewer:	J3
nd Raviawar.	

METHOD: Metals (EPA Method 200.8)

	Concentra			
Analyte	1	2	RPD	
Chromium	1300	680	63	

	Concentr			
Analyte	3	. 4	RPD	
Chromium	30	120	120	

V.\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2017\39385C4a.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 21, 2017

Parameters:

Wet Chemistry

Validation Level:

Level III & IV

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-21317

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MVV-13	1721317-02	Water	08/02/17
DUP-6-3Q17	1721317-03	Water	08/02/17
MW-6	1721317-04	Water	08/02/17
DUP-7-3Q17	1721317-05	Water	08/02/17
MW-5	1721317-06	Water	08/02/17
MW-15	1721317-07	Water	08/02/17
MW-8	1721317-08	Water	08/02/17
EB-8-080217	1721317-09	Water	08/02/17
MW-5MS	1721317-06MS	Water	08/02/17
MW-5MSD	1721317-06MSD	Water	08/02/17
MW-5DUP	1721317-06DUP	Water	08/02/17
MW-15MS	1721317-07MS	Water	08/02/17
MW-15MSD	1721317-07MSD	Water	08/02/17
MW-15DUP	1721317-07DUP	Water	08/02/17
MW-8MS	1721317-08MS	Water	08/02/17
MW-8MSD	1721317-08MSD	Water	08/02/17
MW-8DUP	1721317-08DUP	Water	08/02/17

^{**}Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

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

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

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

III. Continuing Calibration

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

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Nitrite as Nitrogen	0.012280 mg/L	MW-13 MW-8
ICB/CCB	Nitrite as Nitrogen	0.012586 mg/L	MVV-13 MVV-8

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	ample Analyte		Modified Final Concentration	
MW-13	Nitrite as Nitrogen	0.015 mg/L	0.015U mg/L	
MW-8	Nitrite as Nitrogen	0.014 mg/L	0.014U mg/L	

V. Field Blanks

Sample EB-8-080217 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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

Samples MW-13 and DUP-6-3Q17 and samples MW-6 and DUP-7-3Q17 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentration		Concentration		
Analyte	MW-13	DUP-6-2Q17	RPD		
Perchlorate	220 ug/L	230 ug/L	4		
Hexavalent chromium 0.0025 mg/L		0.0027 mg/L	8		

	Concer	. *	
Analyte	MW-6	DUP-7-2Q17	RPD
Perchlorate	2.7 ug/L	2.3 ug/L	16
Hexavalent chromium	0.00070U mg/L	0.0020 mg/L	96

X. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

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

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

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NASA JPL, 3Q2017 Wet Chemistry - Data Qualification Summary - SDG 17-21317

No Sample Data Qualified in this SDG

NASA JPL, 3Q2017 Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 17-21317

Sample	Analyte	Modified Final Concentration	A or P
MVV-13	Nitrite as Nitrogen	0.015U mg/L	А
MVV-8	Nitrite as Nitrogen	0.014U mg/L	А

Reported: 8/30/2017 10:34:03AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-300.0**

MW-13

Laboratory: BC Laboratories

SDG: 17-21317

Tidewater Inc. Client:

Project: JPL- GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1721317-02</u>

File ID: E080217A.seq-22

Sampled: 08/02/17 08:50

Prepared: 08/02/17 22:00

Analyzed: 08/03/17 04:39

Solids: 0.00 Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0315

Sequence:

1714191

Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	53	1		EPA-300.0
14797-55-8	Nitrate as N	4.8	1		EPA-300.0
14808-79-8	Sulfate	49	1	·	EPA-300.0

Reported: 8/30/2017 10:34:03AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-300.0

MW-8

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1721317-08</u>

File ID: <u>E080217A.seq-23</u>

08/02/17 13:01 Sampled:

08/02/17 22:00 Prepared:

Analyzed: 08/03/17 04:57

0.00 Solids:

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0315</u>

Sequence: 1714191 Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	14	1		EPA-300.0
14797-55-8	Nitrate as N	2.6	1		EPA-300.0
14808-79-8	Sulfate	42	1		EPA-300.0

Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/30/2017 10:34:03AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-314.0**

MW-13

Laboratory: BC Laboratories

SDG: 17-21317

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1721317-02RE2</u>

File ID: F081317.seq-38.0000.txt

Sampled: 08/02/17 08:50

Prepared: 08/13/17 11:00

Analyzed: 08/14/17 08:25

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H1278</u>

Sequence:

1714620

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	220	20	D	EPA-314.0

Reported: 8/30/2017 10:34:03AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

DUP-6-3Q17

Laboratory: BC Laboratories

SDG: 17-21317

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: 1721317-03RE2

File ID: F081317.seq-39.0000.txt

Sampled: 08/02/17 09:00

Prepared: 08/13/17 11:00

Analyzed: 08/14/17 08:39

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H1278

Sequence:

1714620

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	230	20	D	EPA-314.0

Reported: 8/30/2017 10:34:03AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-6

Laboratory: BC Laboratories

SDG: 17-21317

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-04RE4</u>

File ID: F081617.seq-42.0000.txt

Sampled: 08/02/17 09:50

Prepared: 08/13/17 11:00

Analyzed: 08/16/17 11:37

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H1593</u>

1714795 Sequence:

Calibration: <u>UNASSIGNED</u>

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

Reported: 8/30/2017 10:34:03AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

DUP-7-3Q17

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-05RE4</u>

File ID: F081617.seq-43.0000.txt

Sampled: 08/02/17 10:00

Prepared: 08/13/17 11:00

Analyzed: 08/16/17 11:51

Solids: <u>0.00</u>

Preparation: No Prep

1714795

Initial/Final: 20 ml / 20 ml

Batch: B[H1593

Sequence:

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

Dog417

Reported: 8/30/2017 10:34:03AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-5

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-06</u>

File ID: F081317.seq-22.0000.txt

Sampled: <u>08/02/17 11:01</u>

02/17 11:01 Prepared: 08/13/17 11:00

Analyzed: 08/13/17 15:56

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H1278

Sequence:

1714620

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0

Reported: 8/30/2017 10:34:03AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-8

Laboratory: BC Laboratories

SDG: 17-21317

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-08RE3</u>

File ID: F081317.seq-47.0000.txt

Sampled: 08/02/17 13:01

Prepared: 08/13/17 11:00

Analyzed: 08/14/17 11:01

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H1278</u>

Sequence:

1714620

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	Ū	EPA-314.0

Reported: 8/30/2017 10:34:03AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

EB-8-080217

Laboratory: BC Laboratories

SDG: 17-21317

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: 1721317-09RE2

File ID: F081317.seq-42.0000.txt

Sampled: 08/02/17 13:15

Prepared: 08/13/17 11:00

Analyzed: 08/14/17 09:20

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H1278</u>

Sequence:

1714620

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0

Environmental Testing Laboratory

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065 Reported: 8/30/2017 10:34:03AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-353,2

MW-13

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-02</u>

File ID: 170803 0842 NO2-032

Sampled: 08/02/17 08:50

Prepared: 08/03/17 08:42

Analyzed: 08/03/17 08:42

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: BIH0398

Sequence: <u>1713831</u>

Calibration: <u>UNASSIGNED</u>

Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.015 U	1	J	EPA-353.2

Tidewater Inc.

Reported: 8/30/2017 10:34:03AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-353.2

MW-8

Laboratory: BC Laboratories

SDG: 17-21317

Calibration: UNASSIGNED

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

3761 Attucks Drive Powell, OH 43065

Laboratory ID: 1721317-08

File ID: 170803 0842 NO2-028

Sampled: 08/02/17 13:01

Sequence:

Prepared: 08/03/17 08:42

Analyzed: 08/03/17 08:42

Solids: 0.00

Batch: B[H0398

Preparation: No Prep 1713831

Initial/Final: 20 ml / 20 ml

Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.014 V	1	J	EPA-353.2

Reported: 8/30/2017 10:34:03AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-365.1

MW-13

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-02</u>

1713938

File ID: 170803 0956 PO4-095

Sampled: 08

08/02/17 08:50

Prepared: 08/03/17 09:56

Analyzed: 08/03/17 09:57

Solids: <u>0.00</u>

Batch: <u>B[H0397</u>

Preparation: No Prep

Sequence:

Initial/Final: 20 ml / 20 ml

Calibration: UNASSIGNED Instrumen

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
	ortho-Phosphate as P	0.044	1	· J	EPA-365.1



Reported: 8/30/2017 10:34:03AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-365.1

MW-8

Laboratory: BC Laboratories

Water

Client: Tidewater Inc.

08/02/17 13:01

Project: JPL-GW Monitoring Wells

Laboratory ID: <u>1721317-08</u>

File ID: 170803 0956 PO4-091

Solids: 0.00

Matrix:

Sampled:

Preparation: No Prep

Prepared: 08/03/17 09:56

Analyzed: 08/03/17 09:57 Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0397</u>

Sequence:

<u>1713938</u>

Calibration: <u>UNASSIGNED</u>

SDG: <u>17-21317</u>

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

Reported: 8/30/2017 10:34:03AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-13

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: 1721317-02

File ID: 170802 2014 CR6-027

Sampled: 08/02/17 08:50

Prepared: 08/02/17 20:14

Analyzed: 08/02/17 20:32

Solids: <u>0.00</u>

Batch: B[H0293

Preparation: No Prep

1713798

Sequence:

Initial/Final: 20 ml / 20 ml

Calibration: UNASSIGNED

ai. <u>20 iii / 20 iii</u>

Instrument: KONE-1

CAS NO. Analyte Concentration (mg/L) Factor Q Method

18540-29-9 Hexavalent Chromium 0.0025 1 EPA-7196



Reported: 8/30/2017 10:34:03AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

DUP-6-3Q17

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-03</u>

File ID: 170802 2014 CR6-006

Sampled:

08/02/17 09:00

Prepared: 08/02/17 20:14

Analyzed: 08/02/17 20:14

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0293

Sequence:

<u>1713798</u>

Calibration: <u>UNASSIGNED</u>

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

Reported: 8/30/2017 10:34:03AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-6

Laboratory: BC Laboratories

SDG: 17-21317

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-04</u>

File ID: 170802 2014 CR6-007

Sampled: <u>08/02/17 09:50</u>

Prepared: <u>08/02/17 20:14</u>

Analyzed: 08/02/17 20:14

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0293</u>

Sequence:

1713798

Calibration: <u>UNASSIGNED</u>

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



Reported: 8/30/2017 10:34:03AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

DUP-7-3Q17

Laboratory: BC Laboratories

SDG: 17-21317

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-05</u>

File ID: 170802 2014 CR6-008

Sampled:

08/02/17 10:00

Prepared: 08/02/17 20:14

Analyzed: 08/02/17 20:14

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0293</u>

<u>1713798</u> Sequence:

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0020	1		EPA-7196

Reported: 8/30/2017 10:34:03AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-5

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: 1721317-06

File ID: 170802 2014 CR6-009

Sampled: <u>08/02/17 11:01</u>

Prepared: <u>08/02/17 20:14</u>

Analyzed: <u>08/02/17 20:14</u>

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0293</u>

Sequence: 17

1713798

Calibration: <u>UNASSIGNED</u>

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

Reported: 8/30/2017 10:34:03AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-15

Laboratory: BC Laboratories

SDG: 17-21317

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1721317-07</u>

File ID: 170802 2014 CR6-010

Sampled: <u>08/02/17 11:50</u>

Prepared: 08/02/17 20:14

Analyzed: 08/02/17 20:14

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0293</u>

Sequence:

1713798

Calibration: <u>UNASSIGNED</u>

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: 8/30/2017 10:34:03AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-8.

Laboratory: BC Laboratories

SDG: 17-21317

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1721317-08</u>

File ID: 170802 2014 CR6-018

Sampled: 08/02/17 13:01

Prepared: 08/02/17 20:14

Analyzed: 08/02/17 20:20

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0295</u>

Sequence:

1713798

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.00083	1	J	EPA-7196

Reported: 8/30/2017 10:34:03AM
Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

EB-8-080217

Laboratory: BC Laboratories

SDG: <u>17-21317</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721317-09</u>

File ID: 170802 2014 CR6-022

Sampled: 08/02/17 13:15

Prepared: 08/02/17 20:14

Analyzed: 08/02/17 20:21

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0295

Sequence: <u>1713798</u>

Calibration: <u>UNASSIGNED</u>

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

VALIDATION COMPLETENESS WORKSHEET

Level III

Page: 1 of 2 Reviewer: 13 2nd Reviewer: 14

SDG #: 17-21317 Laboratory: BC Laboratories, Inc.

LDC #: 39385C6

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA SW846 Method 7196), Orthophosphate-P (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 /A	
11	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	NP	EB=8
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	·
VIII.	Laboratory control samples	A	Las ,
IX.	Field duplicates	SW	(1,2) (3,4)
X	Sample result verification	N	/ / /
LxL	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	MVV-13	1721317-02	Water	08/02/17
2	DUP-6-3Q17	1721317-03	Water	08/02/17
3	MVV-6	1721317-04	Water	08/02/17
4	DUP-7-3Q17	1721317-05	Water	08/02/17
5	MW-5	1721317-06	Water	08/02/17
6	MW-15	1721317-07	Water	08/02/17
7	MW-8	1721317-08	Water	08/02/17
8	EB-8-080217	1721317-09	Water	08/02/17
9	MW-5MS 4	1721317-06MS	Water	08/02/17
10	MW-5MSD	1721317-06MSD	Water	08/02/17
11	MW-5DUP	1721317-06DUP	Water	08/02/17
12	MVV-15MS *	1721317-07MS	Water	08/02/17
13	MW-15MSD	1721317-07MSD	Water	08/02/17
14	MW-15DUP	1721317-07DUP	Water	08/02/17
15	MW-8MS-*	1721317-08MS	Water	08/02/17
16	MW-8MSD	1721317-08MSD	Water	08/02/17
17	MW-8DUP	1721317-08DUP	Water	08/02/17

LDC	#: <u>39385C6</u>	VALIDATION COMPLET	ENESS WORKSHE	EI	Date: <u>4 / 18/1</u>
SDG	6 #: <u>17-21317</u>	Leve			Page: 2of 2
Labo	oratory: <u>BC Laboratori</u>	es, Inc.		R 2nd R	Reviewer: 13
		ride, Nitrate-N, Sulfate (EPA Method 6), Orthophosphate-P (EPA Method			valent Chromium
	Client ID		Lab ID	Matrix	Date
18					
19					
20					
21_					
22				·	
Note	es:				
					·

DC#: <u>39395C</u>4

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:1	_of	1_
Reviewer:	JB	
2nd reviewer:_	n	

\ll circled methods are applicable to each sample.

Sample ID	Parameter
	pH TDS (CI) F (NO ₃ (NO), SO ₄ O-PO ₄) Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
1-8	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
0C	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
9-11	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
12-14	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
1517	pH TDS CI)F (NO) (NO) (SO4) (O-PO4) AIK CN NH3 TKN TOC (Cr6+) CIO4
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH_TDS_CI_F_NO3_NO2_SO4_O-PO4_Alk_CN_NH3_TKN_TOC_Cr6+_ClO4_
	pH TDS CI F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
<u> </u>	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CLF NO, NO, SO, O-PO, Alk CN NH, TKN TOC Cr6+ ClO,

mments:	

LDC #: 39385C6

VALIDATION FINDINGS WORKSHEET Blanks

Page: 1_of_1_	
Reviewer: \3	
2nd Reviewer:	_
	_

METHOD:Inorganics, Method See Cover

Conc. units: mg/L Associated Samples: 1, 7

Analyte	Blank ID	Blank ID	Blank		_				
	РВ	ICB/CCB (mg/L)	Action Limit	1	7	,			
Nitrite as N	0.012280	0.012586	0.06293	0.015	0.014				

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#: 39385C6

VALIDATION FINDINGS WORKSHEET Field Duplicates

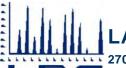
Page:	1	_of_	1
Reviewer:		V.	3
2nd Reviewer:		A	

Inorganics, Method_See Cover

	Conce			
Analyte	1	2	RPD	
Perchlorate (ug/L)	220	230	4	
Hexavalent Chromium (mg/L)	0.0025	0.0027	8	

	Concentration		Concentration		Concentration			
Analyte	3	4	RPD					
Perchlorate (ug/L)	2.7	2.3	16					
Hexavalent Chromium (mg/L)	0.00070U	0.0020	96					

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2017\39385C6.wpd



LABORATORY DATA CONSULTANTS, INC.

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

Tidewater, Inc. 3761 Attucks Drive Powell, OH 43065 September 22, 2017

ATTN: Mr. David Conner

SUBJECT: NASA JPL, 3Q2017, Data Validation

Dear Mr. Conner,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on September 1, 2017. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #39394:

SDG # Fraction

17-21091, 17-21528 Volatiles, Chromium, Wet Chemistry

The data validation was performed under 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, update V, July 2014

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

Sincerely,

Pei Geng

Project Manager/Senior Chemist

Attachment 1 HC LDC #39394 (Tidewater- Powell, OH / NASA JPL, 3Q2017) 90/10 (client select) (3) CI,SO4 0-NO₂-N NO₃-N PO₄-P Cr CLO₄ Cr(VI) DATE DATE VOA LDC SDG# **REC'D** DUE (524.2)(200.8) (300.0) (353.2) (365.1) (314.0) (7196) | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | w | s | w | s | w | s | w | w s w s w s w s w s w s Matrix: Water/Soil 09/01/17 09/25/17 12 17-21091 Α 17-21091 09/01/17 09/25/17 0 0 0 0 0 5 В 09/01/17 09/25/17 17-21528 13 0 0 0 0 0 0 0 0 16 Total T/PG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 20, 2017

Parameters:

Volatiles

Validation Level:

Level III & IV

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-21091

Commis Islandisiastica	Laboratory Sample	B4 - 4-1	Collection
Sample Identification	Identification	Matrix	Date
TB-7-080117	1721091-01	Water	08/01/17
MW-12-5	1721091-02	Water	08/01/17
MW-12-4**	1721091-03**	Water	08/01/17
MW-12-3	1721091-04	Water	08/01/17
DUP-4-3Q17	1721091-05	Water	08/01/17
MW-12-2	1721091-06	Water	08/01/17
MW-12-1	1721091-07	Water	08/01/17
MW-11-4	1721091-08	Water	08/01/17
MW-11-3	1721091-09	Water	08/01/17
MW-11-2	1721091-10	Water	08/01/17
DUP-5-3Q17	1721091-11	Water	08/01/17
MW-11-1	1721091-12	Water	08/01/17
EB-7-080117	1721091-13	Water	08/01/17
MW-12-5MS	1721091-02MS	Water	08/01/17
MW-12-5MSD	1721091-02MSD	Water	08/01/17

^{**}Indicates sample underwent Level IV review

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV evaluation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to nonconformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r²) were greater than or equal to 0.990.

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/04/17	Methyl iodide Pentachloroethane	51.8 (≤30) 33.9 (≤30)	All samples in SDG 17-21091	UJ (all non-detects) UJ (all non-detects)	P

V. Laboratory Blanks

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

VI. Field Blanks

Sample TB-7-080117 was identified as a trip blank. No contaminants were found.

Sample EB-7-080117 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

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

X. Field Duplicates

Samples MW-12-3 and DUP-4-3Q17 and samples MW-11-2 and DUP-5-3Q17 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentr		
Analyte	MW-12-3	DUP-4-3Q17	RPD
Carbon tetrachloride	0.40	0.32	22
Chloroform	0.78	0.63	21

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

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

Due to continuing calibration %D, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (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, 3Q2017 Volatiles - Data Qualification Summary - SDG 17-21091

Sample	Compound	Flag	A or P	Reason
TB-7-080117 MW-12-5 MW-12-4** MW-12-3 DUP-4-3Q17	Methyl iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects)	Р	Continuing calibration (%D)
MW-12-2 MW-12-1 MW-11-4 MW-11-3 MW-11-2 DUP-5-3Q17 MW-11-1 EB-7-080117				

NASA JPL, 3Q2017

Volatiles - Laboratory Blank Data Qualification Summary - SDG 17-21091

No Sample Data Qualified in this SDG



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-7-080117

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-01</u>

File ID:

<u>04AUG14.D</u>

Sampled:

08/01/17 07:00

Prepared: 08/0

<u>08/04/17 07:00</u> Analyzed:

.....

08/04/17 14:17 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	1707017 Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U ·
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

269217

Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project: JPL- GVV Wonitoring

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-7-080117

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-01</u>

File ID:

04AUG14.D

Sampled:

08/01/17 07:00

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 14:17

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	1707017 Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	TQ
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1′	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET **EPA-524.2**

TB-7-080117

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-01

File ID:

04AUG14.D

Sampled:

08/01/17 07:00

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 14:17

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

1713791 1707017 B[H0384 Calibration: Instrument: MS-V5 Batch: Sequence: COMPOUND DILUTION CONC. (ug/L) CAS NO. Q Carbon disulfide 0.48 U 75-15-0 1 trans-1,4-Dichloro-2-butene 1.8 U 110-57-6 Diethyl ether 1 0.33 U 60-29-7 1 1.3 U 97-63-2 Ethyl methacrylate 1 0.32 Ethyl t-butyl ether U 637-92-3 Hexachloroethane 1 0.11 U 67-72-1 1 5.0 U 2-Hexanone 591-78-6 1 2.3 U Methacrylonitrile 126-98-7 1 3.3 U 78-93-3 Methyl ethyl ketone U UJ 1 1.1 Methyl iodide 74-88-4 Methyl isobutyl ketone 1 2.4 U 108-10-1 1 1.2 U Methyl methacrylate 80-62-6 Pentachloroethane 1 0.63 U M 76-01-7 1 6.2 U 107-12-0 Propionitrile Tetrahydrofuran 1 5.2 U 109-99-9 1 p- & m-Xylenes 0.34 U 179601-23-1 1 0.13 U o-Xylene 95-47-6

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	8.3600	83.6	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.2000	92.0	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	11.220	112	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	223610	6.58	230753	6.57	
Chlorobenzene-d5 (IS)	76251	9.61	81486	9.61	
1,4-Difluorobenzene (IS)	312335	7.38	338008	7.38	

^{*} Values outside of QC limits



Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET **EPA-524.2**

TB-7-080117

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-01</u>

File ID:

04AUG14.D

Sampled:

08/01/17 07:00

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 14:17

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Datah

B[H0384

1713791

1707017 Calibration

Instrument MC VIS

Batch:	<u>DITIO384</u> Sequence: <u>1713731</u>	Cambration;	1707017 Instrument:	<u>1V15- V 5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
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

^{*} Values outside of QC limits

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-5

Laboratory:

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-02

File ID:

04AUG07.D

Sampled:

08/01/17 07:30

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 11:36

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	1707017 Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	<u> </u>	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.28	J
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-5

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-02

File ID:

04AUG07.D

Sampled:

08/01/17 07:30

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 11:36

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Solids:	Preparation: <u>Er</u>	A 3030 water MS	Initial/Final: 25 mi / 25 mi	
Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	Ŭ
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	Ŭ
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-5

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-02

File ID:

04AUG07.D

Sampled:

08/01/17 07:30

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 11:36

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0384 Sequence:	<u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND		DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide		1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene		1	1.8	U
60-29-7	Diethyl ether		1	0.33	U
97-63-2	Ethyl methacrylate		1	1.3	U
637-92-3	Ethyl t-butyl ether		1	0.32	U
67-72-1	Hexachloroethane		1	0.11	U
591-78-6	2-Hexanone		1	5.0	U
126-98-7	Methacrylonitrile		1	2.3	U
78-93-3	Methyl ethyl ketone		1	3.3	U
74-88-4	Methyl iodide		1	1.1	υ / /3
108-10-1	Methyl isobutyl ketone		1	2.4	U
80-62-6	Methyl methacrylate		1	1.2	U
76-01-7	Pentachloroethane		1	0.63	U MZ
107-12-0	Propionitrile		1	6.2	U
109-99-9	Tetrahydrofuran		11	5.2	U
179601-23-1	p- & m-Xylenes		1	0.34	U
95-47-6	o-Xylene		1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.6400	96.4	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.3200	93.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.7700	87.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	221283	6.57	230753	6.57	
Chlorobenzene-d5 (IS)	79776	9.62	81486	9.61	
1,4-Difluorobenzene (IS)	303623	7.38	338008	7.38	

^{*} Values outside of QC limits

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-5

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Water

Project:

JPL- GW Monitoring Wells

Matrix: Sampled:

Prepared:

08/04/17 07:00

1721091-02

File ID: Analyzed:

08/04/17 11:36

Solids:

08/01/17 07:30

Preparation:

Laboratory ID:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

04AUG07.D

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
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
70-46-9	2-Nitropropage	1		U

^{*} Values outside of QC limits

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-4

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-03

File ID:

04AUG15.D

Sampled:

08/01/17 08:00

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 14:40

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

atch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.30	J
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.41	J
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-4

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

Prepared:

1721091-03

File ID:

04AUG15.D

Sampled:

08/01/17 08:00

08/04/17 07:00

Analyzed:

08/04/17 14:40 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration: 1	707017 Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-4

Laboratory:

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-03</u>

File ID:

<u>04AUG15.D</u>

Sampled:

08/01/17 08:00

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 14:40

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

108-10-1 Methyl isobutyl ketone 1 2.4 U 80-62-6 Methyl methacrylate 1 1.2 U	Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
110-57-6 trans-1,4-Dichloro-2-butene 1 1.8 U	CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
60-29-7 Diethyl ether 1 0.33 U 97-63-2 Ethyl methacrylate 1 1.3 U 637-92-3 Ethyl t-butyl ether 1 0.32 U 67-72-1 Hexachloroethane 1 0.11 U 591-78-6 2-Hexanone 1 5.0 U 126-98-7 Methacrylonitrile 1 2.3 U 78-93-3 Methyl ethyl ketone 1 3.3 U 74-88-4 Methyl isobutyl ketone 1 1.1 U 108-10-1 Methyl isobutyl ketone 1 2.4 U 80-62-6 Methyl methacrylate 1 1.2 U 76-01-7 Pentachloroethane 1 0.63 U U 107-12-0 Propionitrile 1 6.2 U 109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p-& m-Xylenes 1 0.34 U	75-15-0	Carbon disulfide	1	0.48	U
97-63-2 Ethyl methacrylate 1 1.3 U 637-92-3 Ethyl t-butyl ether 1 0.32 U 67-72-1 Hexachloroethane 1 0.11 U 591-78-6 2-Hexanone 1 5.0 U 126-98-7 Methacrylonitrile 1 2.3 U 78-93-3 Methyl ethyl ketone 1 3.3 U 74-88-4 Methyl iodide 1 1.1 U 108-10-1 Methyl isobutyl ketone 1 2.4 U 80-62-6 Methyl methacrylate 1 1.2 U 76-01-7 Pentachloroethane 1 0.63 U U 107-12-0 Propionitrile 1 6.2 U 109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p-& m-Xylenes 1 0.34 U	110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
637-92-3 Ethyl t-butyl ether 1 0.32 U 677-72-1 Hexachloroethane 1 0.11 U 591-78-6 2-Hexanone 1 5.0 U 126-98-7 Methacrylonitrile 1 2.3 U 78-93-3 Methyl ethyl ketone 1 3.3 U 74-88-4 Methyl iodide 1 1.1 U 108-10-1 Methyl isobutyl ketone 1 2.4 U 80-62-6 Methyl methacrylate 1 1.2 U 76-01-7 Pentachloroethane 1 0.63 U U 107-12-0 Propionitrile 1 6.2 U 109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p- & m-Xylenes 1 0.34 U	60-29-7	Diethyl ether	1	0.33	U
67-72-1 Hexachloroethane 1 0.11 U 591-78-6 2-Hexanone 1 5.0 U 126-98-7 Methacrylonitrile 1 2.3 U 78-93-3 Methyl ethyl ketone 1 3.3 U 74-88-4 Methyl iodide 1 1.1 U 108-10-1 Methyl isobutyl ketone 1 2.4 U 80-62-6 Methyl methacrylate 1 1.2 U 76-01-7 Pentachloroethane 1 0.63 U U 107-12-0 Propionitrile 1 6.2 U 109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p- & m-Xylenes 1 0.34 U	97-63-2	Ethyl methacrylate	1	1.3	U
591-78-6 2-Hexanone 1 5.0 U 126-98-7 Methacrylonitrile 1 2.3 U 78-93-3 Methyl ethyl ketone 1 3.3 U 74-88-4 Methyl iodide 1 1.1 U 108-10-1 Methyl isobutyl ketone 1 2.4 U 80-62-6 Methyl methacrylate 1 1.2 U 76-01-7 Pentachloroethane 1 0.63 U U 107-12-0 Propionitrile 1 6.2 U 109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p- & m-Xylenes 1 0.34 U	637-92-3	Ethyl t-butyl ether	11	0.32	U
126-98-7 Methacrylonitrile 1 2.3 U 78-93-3 Methyl ethyl ketone 1 3.3 U 74-88-4 Methyl iodide 1 1.1 U 108-10-1 Methyl isobutyl ketone 1 2.4 U 80-62-6 Methyl methacrylate 1 1.2 U 76-01-7 Pentachloroethane 1 0.63 U U 107-12-0 Propionitrile 1 6.2 U 109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p- & m-Xylenes 1 0.34 U	67-72-1	Hexachloroethane	11	0.11	U
78-93-3 Methyl ethyl ketone 1 3.3 U 74-88-4 Methyl iodide 1 1.1 U 108-10-1 Methyl isobutyl ketone 1 2.4 U 80-62-6 Methyl methacrylate 1 1.2 U 76-01-7 Pentachloroethane 1 0.63 U U 107-12-0 Propionitrile 1 6.2 U 109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p- & m-Xylenes 1 0.34 U	591-78-6	2-Hexanone	1	5.0	U
74-88-4 Methyl iodide 1 1.1 U 108-10-1 Methyl isobutyl ketone 1 2.4 U 80-62-6 Methyl methacrylate 1 1.2 U 76-01-7 Pentachloroethane 1 0.63 U U 107-12-0 Propionitrile 1 6.2 U 109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p- & m-Xylenes 1 0.34 U	126-98-7	Methacrylonitrile	1	2.3	U
108-10-1 Methyl isobutyl ketone 1 2.4 U 80-62-6 Methyl methacrylate 1 1.2 U 76-01-7 Pentachloroethane 1 0.63 U U 107-12-0 Propionitrile 1 6.2 U 109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p- & m-Xylenes 1 0.34 U	78-93-3	Methyl ethyl ketone	1	3.3	U
80-62-6 Methyl methacrylate 1 1.2 U 76-01-7 Pentachloroethane 1 0.63 U U 107-12-0 Propionitrile 1 6.2 U 109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p- & m-Xylenes 1 0.34 U	74-88-4	Methyl iodide	1	1.1	UU
76-01-7 Pentachloroethane 1 0.63 U 107-12-0 Propionitrile 1 6.2 U 109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p- & m-Xylenes 1 0.34 U	108-10-1	Methyl isobutyl ketone	11	2.4	U
107-12-0 Propionitrile 1 6.2 U 109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p- & m-Xylenes 1 0.34 U	80-62-6	Methyl methacrylate	1	1.2	
109-99-9 Tetrahydrofuran 1 5.2 U 179601-23-1 p- & m-Xylenes 1 0.34 U	76-01-7	Pentachloroethane	1	0.63	UU
179601-23-1 p- & m-Xylenes 1 0.34 U	107-12-0	Propionitrile	1	6.2	U
177001 25 1 F	109-99-9	Tetrahydrofuran	1	5.2	U
95-47-6 o-Xylene 1 0.13 U	179601-23-1	p- & m-Xylenes	1	0.34	U
	95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.8300	98.3	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8100	98.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.1600	91.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	215534	6.57	230753	6.57	
Chlorobenzene-d5 (IS)	78546	9.61	81486	9.61	
1,4-Difluorobenzene (IS)	329340	7.38	338008	7.38	

^{*} Values outside of QC limits

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-4

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project: 1721091-03 File ID:

JPL- GW Monitoring Wells

Matrix: Sampled:

08/01/17 08:00

Water

Prepared:

Laboratory ID:

08/04/17 07:00

Analyzed:

08/04/17 14:40

04AUG15.D

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	11		U
513-88-2	1,1-Dichloropropanone	111		U
96-33-3	Methyl acrylate	11		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1	<u> </u>	U

^{*} Values outside of QC limits



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

oot Number: 3017

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-3

Laboratory:

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-04

File ID:

<u>04AUG16.D</u>

Sampled:

08/01/17 08:15

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 15:03

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

sonus.	•	11 5050 Water Mis	mittan mai.	
Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.40	J
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.78	
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-3

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-04

File ID:

04AUG16.D

Sampled:

08/01/17 08:15

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 15:03

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Solids:	Preparation:	EPA 3030 Water MS	Initial/Final: 23 ml / 23 ml	
Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	-1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	11	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	11	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-3

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-04

File ID:

04AUG16.D

Sampled:

08/01/17 08:15

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 15:03

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0384 Sequence:	<u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND		DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide		1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene		1	1.8	U
60-29-7	Diethyl ether		11	0.33	U
97-63-2	Ethyl methacrylate		11	1.3	U
637-92-3	Ethyl t-butyl ether		1	0.32	U .
67-72-1	Hexachloroethane		1	0.11	U
591-78-6	2-Hexanone		1	5.0	U
126-98-7	Methacrylonitrile		11	2.3	U
78-93-3	Methyl ethyl ketone		1	3.3	U
74-88-4	Methyl iodide		1	1.1	ע אָן
108-10-1	Methyl isobutyl ketone		11	2.4	U
80-62-6	Methyl methacrylate		1	1.2	U
76-01-7	Pentachloroethane		11	0.63	UU
107-12-0	Propionitrile		1	6.2	U
109-99-9	Tetrahydrofuran		11	5.2	U
179601-23-1	p- & m-Xylenes		1	0.34	U
95-47-6	o-Xylene		1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.100	101	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9400	99.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6400	96.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	209327	6.58	230753	6.57	
Chlorobenzene-d5 (IS)	85919	9.61	81486	9.61	
1,4-Difluorobenzene (IS)	312102	7.38	338008	7.38	

^{*} Values outside of QC limits



Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-3

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-04

File ID:

04AUG16.D

Sampled:

08/01/17 08:15

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 15:03

Solids:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:

ВГН0384

Preparation: 1713791

Calibration:

1707017

Instrument: MS-V5

Batch:	B[H0384 Sequence:	<u>1713791</u>	Calibration:	<u>1707017</u>	Instrument:	MS-V5
CAS NO.	COMPOUND		DILUTION	CC	ONC. (ug/L)	Q
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

^{*} Values outside of QC limits

Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-4-3Q17

Laboratory:

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-05</u> File ID:

04AUG17.D

Sampled:

08/01/17 08:25

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 15:26

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Solids:	Preparation:	EFA 3030 Water MIS	Initial/Final: 25 IIII / 25 IIII	
Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	1707017 Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1 .	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	11	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.32	J
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.63	
74-87-3	Chloromethane	11	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95 - 3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-4-3Q17

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-05</u>

File ID:

04AUG17.D

Sampled:

08/01/17 08:25

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 15:26

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Sonds:		rrepa	iration:	LIA JU	oo water wis	mmar mar.	<u>25 mi / 25 mi</u>	
Batch:	B[H0384	Sequence:	<u>1713791</u>		Calibration:	<u>1707017</u>	Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND				DILUTION	СО	NC. (ug/L)	Q
563-58-6	1,1-Dichloroproper	ne			1		0.19	U
10061-01-5	cis-1,3-Dichloropro	pene			1		0.14	U
10061-02-6	trans-1,3-Dichlorop	oropene			1		0.13	U
100-41-4	Ethylbenzene				1		0.15	Ŭ
87-68-3	Hexachlorobutadie	ne			1		0.20	Ŭ
98-82-8	Isopropylbenzene				1		0.14	U
99-87-6	p-Isopropyltoluene				1		0.14	U
75-09-2	Methylene chloride				1		0.21	U
1634-04-4	Methyl t-butyl ethe	r			1		0.14	U
91-20-3	Naphthalene				1		0.16	U
103-65-1	n-Propylbenzene				1		0.12	U
100-42-5	Styrene				1		0.12	U
630-20-6	1,1,1,2-Tetrachloro	ethane			1		0.21	U
79-34-5	1,1,2,2-Tetrachloro	ethane			1		0.17	U
127-18-4	Tetrachloroethene				1		0.23	U
108-88-3	Toluene				1		0.17	U
87-61-6	1,2,3-Trichlorobenz	zene			1		0.19	U
120-82-1	1,2,4-Trichlorobenz	zene			1		0.15	U
71-55-6	1,1,1-Trichloroetha	ne			1		0.21	U
79-00-5	1,1,2-Trichloroetha	ne			1		0.21	Ŭ
79-01-6	Trichloroethene				1		0.19	U
75-69-4	Trichlorofluoromet	hane			1		0.14	U
96-18-4	1,2,3-Trichloroprop	ane			11		0.78	U
76-13-1	1,1,2-Trichloro-1,2	,2-trifluoroetha	ne		1		0.19	U
95-63-6	1,2,4-Trimethylben	zene			1		0.17	U
108-67-8	1,3,5-Trimethylben	zene			1		0.14	U
75-01-4	Vinyl chloride				1		0.18	U
67-64-1	Acetone				1		6.6	U
107-13-1	Acrylonitrile				1		1.5	U
107-05-1	Allyl chloride				1		0.47	U
994-05-8	t-Amyl Methyl ethe	er			1		0.19	U
75-65-0	t-Butyl alcohol				1		9.4	U

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-4-3Q17

Laboratory:

Tidewater Inc.

3761 Attucks Drive Powell, OH 43065

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Laboratory ID:

Water

1721091-05

File ID:

04AUG17.D

Sampled:

08/01/17 08:25

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 15:26

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml Instrument: MS-V5

Batch:	B[H0384 Sequen	nce: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND		DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide		1	0.48	U
110-57-6	trans-1,4-Dichloro-2-bute	ene	1	1.8	U
60-29-7	Diethyl ether		1	0.33	U
97-63-2	Ethyl methacrylate		1	1.3	U
637-92-3	Ethyl t-butyl ether		1	0.32	U
67-72-1	Hexachloroethane		1	0.11	U
591-78-6	2-Hexanone		1	5.0	U
126-98-7	Methacrylonitrile		1	2.3	U
78-93-3	Methyl ethyl ketone		1	3.3	U
74-88-4	Methyl iodide		1	1.1	UV
108-10-1	Methyl isobutyl ketone		1	2.4	U
80-62-6	Methyl methacrylate		1	1.2	U ,
76-01-7	Pentachloroethane		11	0.63	UU
107-12-0	Propionitrile		1	6.2	U
109-99-9	Tetrahydrofuran		1	5.2	U
179601-23-1	p- & m-Xylenes		1	0.34	U
95-47-6	o-Xylene		1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.8900	98.9	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7300	97.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	8.6200	86.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	210733	6.57	230753	6.57	
Chlorobenzene-d5 (IS)	81341	9.61	81486	9.61	
1,4-Difluorobenzene (IS)	317100	7.38	338008	7.38	

^{*} Values outside of QC limits



Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-4-3Q17

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-05

File ID:

04AUG17.D

Sampled:

08/01/17 08:25

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 15:26

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u>	Sequence:	<u>1713791</u>	Calibration:	<u>1707017</u>	Instrument:	MS-V5
CAS NO.	COMPOUND			DILUTION	C	ONC. (ug/L)	Q
107-14-2	Chloroacetoni	trile		1			U
109-69-3	1-Chlorobutan	ie		1			U
513-88-2	1,1-Dichlorop	ropanone		1			U
96-33-3	Methyl acrylat	te		1			U
98-95-3	Nitrobenzene			1			U
79-46-9	2-Nitropropan	е		1			U

^{*} Values outside of QC limits



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-2

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

110,000

File ID: 04AUG18.D

Sampled:

Prepared:

Preparation:

1721091-06 08/04/17 07:00 File ID:
Analyzed:

08/04/17 15:49

Solids:

08/01/17 09:15

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U



Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-2

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-06

File ID:

04AUG18.D

Sampled:

08/01/17 09:15

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 15:49

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	1707017 Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Environmental Testing Laboratory Since 1949

Tidewater Inc.

Reported: 8/31/2017 11:08:10AM

3761 Attucks Drive

Project: JPL- GW Monitoring We

Project: JPL- GW Monitoring Wells
Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-2

Laboratory:

Powell, OH 43065

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID: <u>1721091-06</u>

File ID:

04AUG18.D

Sampled:

08/01/17 09:15

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 15:49

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0384	Sequence:	<u>1713791</u>		Calibration:	<u>1707017</u>	Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND)			DILUTION	C	ONC. (ug/L)	Q
75-15-0	Carbon disulf	ide		:	1		0.48	U
110-57-6	trans-1,4-Dich	nloro-2-butene			1		1.8	U
60-29-7	Diethyl ether				1		0.33	U
97-63-2	Ethyl methacr	ylate			1		1.3	U
637-92-3	Ethyl t-butyl e	ether			1		0.32	U
67-72-1	Hexachloroetl	nane			1		0.11	U
591-78-6	2-Hexanone				11		5.0	U
126-98-7	Methacrylonit	rile			11		2.3	U
78-93-3	Methyl ethyl l	cetone			11		3.3	U
74-88-4	Methyl iodide				1		1.1	CNA
108-10-1	Methyl isobut	yl ketone			1		2.4	U
80-62-6	Methyl metha	crylate			· 1		1.2	U
76-01-7	Pentachloroet	hane			1		0.63	UW
107-12-0	Propionitrile				1		6.2	U
109-99-9	Tetrahydrofur	an			11		5.2	U
179601-23-1	p- & m-Xylen	es			1		0.34	U
95-47-6	o-Xylene				1		0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.310	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.9000	99.0	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7700	97.7	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	214627	6.57	230753	6.57	
Chlorobenzene-d5 (IS)	85142	9.61	81486	9.61	
1,4-Difluorobenzene (IS)	318108	7.38	338008	7.38	

^{*} Values outside of QC limits



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-2

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

Flojeci.

File ID:

04AUG18.D

Sampled:

08/01/17 09:15

Prepared:

Preparation:

<u>1721091-06</u> <u>08/04/17 07:00</u>

Analyzed:

08/04/17 15:49

Solids:

00/01/1/ 05/12

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

B[H0384 1713791 1707017 Batch: Sequence: Calibration: Instrument: MS-V5 DILUTION CONC. (ug/L) CAS NO. COMPOUND Q 107-14-2 Chloroacetonitrile U 1-Chlorobutane 1 U 109-69-3 1,1-Dichloropropanone 1 U 513-88-2 1 Methyl acrylate U 96-33-3 1 U Nitrobenzene 98-95-3 2-Nitropropane 1 U 79-46-9

^{*} Values outside of QC limits



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-1

Laboratory:

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-07</u>

File ID:

04AUG19.D

Sampled:

08/01/17 09:45

08/04/17 07:00

Analyzed:

08/04/17 16:12

Solids:

Prepared:
Preparation:

EPA 5030 Water MS

Initial/Final:

Solias:	Preparation:	EFA 5050 Water MS	Initial/Final: 23 IIII / 23 IIII	
Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-12-1

Laboratory:

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-07</u>

File ID:

04AUG19.D

Sampled:

08/01/17 09:45

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 16:12

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	11	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	11	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	11	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	11	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	11	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1111	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	Ū
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	Ŭ
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET **EPA-524.2**

MW-12-1

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-07 File ID:

04AUG19.D

Sampled:

08/01/17 09:45

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 16:12

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	B[H0384	Sequence:	<u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND)		DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulf	ide		1	0.48	U
110-57-6	trans-1,4-Dicl	hloro-2-butene		1	1.8	U
60-29-7	Diethyl ether			1	0.33	U
97-63-2	Ethyl methaci	rylate		 1	1.3	U
637-92-3	Ethyl t-butyl	ether		11	0.32	U
67-72-1	Hexachloroet	hane		1	0.11	U
591-78-6	2-Hexanone			 11	5.0	Ŭ
126-98-7	Methacryloni	trile		1	2.3	U
78-93-3	Methyl ethyl	ketone		 1	3.3	U
74-88-4	Methyl iodide	· ,		 1	1.1	UUI
108-10-1	Methyl isobut	yl ketone		 1	2.4	U
80-62-6	Methyl metha	crylate		 1	1.2	Ŭ
76-01-7	Pentachloroet	hane		 1	0.63	UUT
107-12-0	Propionitrile			1	6.2	Ŭ
109-99-9	Tetrahydrofur	an		 1	5.2	U
179601-23-1	p- & m-Xylen	ies		 1	0.34	U
95-47-6	o-Xylene			11	0.13	Ŭ

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.380	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8200	98.2	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.8200	98.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	209239	6.57	230753	6.57	
Chlorobenzene-d5 (IS)	83261	9.62	81486	9.61	
1,4-Difluorobenzene (IS)	311271	7.38	338008	7.38	

^{*} Values outside of QC limits

86072117



Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET **EPA-524.2**

MW-12-1

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-07</u>

File ID:

04AUG19.D

Sampled:

08/01/17 09:45

Nitrobenzene

2-Nitropropane

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 16:12

Solids:

Preparation:

EPA 5030 Water MS

1

Initial/Final:

25 ml / 25 ml

Q

U

U

U

U

U

U

1707017 MS-V5 B[H0384 1713791 Calibration: Batch: Sequence: Instrument: COMPOUND DILUTION CONC. (ug/L) CAS NO. Chloroacetonitrile 107-14-2 1-Chlorobutane 1 109-69-3 1 1,1-Dichloropropanone 513-88-2 1 96-33-3 Methyl acrylate 1

98-95-3

79-46-9

^{*} Values outside of QC limits

Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-4

Laboratory:

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-08</u>

File ID:

04AUG20.D

Sampled:

08/01/17 11:00

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 16:35

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Solius:	Freparation.	1 3030 Water 1915		
Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U -
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	11	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	11	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

SURYHIT



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-4

Laboratory:

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

110,000

File ID:

04AUG20.D

Sampled:

08/01/17 11:00

Prepared:

08/04/17 07:00

1721091-08

Analyzed:

08/04/17 16:35

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Solids:	Preparation: <u>Er</u>	A 3030 Water MS	Initial/Final: 23 mi / 23 mi	
Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	11	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	11	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	11	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U



Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-4

Laboratory:

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

17 21051

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-08

File ID:

<u>04AUG20.D</u>

Sampled:

08/01/17 11:00

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 16:35

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	11	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	111	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	11	3.3	U
74-88-4	Methyl iodide	11	1.1	UV
108-10-1	Methyl isobutyl ketone	11	2.4	U
80-62-6	Methyl methacrylate	111	1.2	U
76-01-7	Pentachloroethane	1	0.63	UVI
107-12-0	Propionitrile	11	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	11	0.34	U
95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.410	104	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7400	97.4	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6000	96.0	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	205701	6.58	230753	6.57	
Chlorobenzene-d5 (IS)	85483	9.62	81486	9.61	
1,4-Difluorobenzene (IS)	316984	7.38	338008	7.38	

^{*} Values outside of QC limits



Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-4

Laboratory:

BC Laboratories

SDG:

17-21091

Tidewater Inc.

Client: Matrix:

Laboratory ID:

Project:

File ID:

JPL- GW Monitoring Wells

04AUG20.D

Sampled:

08/01/17 11:00

Water

Prepared:

08/04/17 07:00

1721091-08

Analyzed:

08/04/17 16:35

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0384	Sequence:	<u>1713791</u>	Calibration:	<u>1707017</u>	Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND			DILUTION	C	ONC. (ug/L)	Q
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

^{*} Values outside of QC limits



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-3

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

Prepared:

<u>1721091-09</u>

File ID:

<u>04AUG21.D</u>

Sampled:

08/01/17 11:30

08/04/17 07:00

Analyzed:

08/04/17 16:58 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	1707017 Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	. 1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

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Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-3

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-09

File ID:

04AUG21.D

Sampled:

08/01/17 11:30

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 16:58 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

olias:	Preparation: <u>El P</u>	1 JUJU Water MIS	Initial/Final: 25 ini/25 ini	
Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.13	J
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	11	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	Ŭ
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-3

Laboratory:

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-09</u>

File ID:

04AUG21.D

Sampled:

08/01/17 11:30

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 16:58 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

1111 / 20 III

Batch:	B[H0384 Sequence:	<u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND		DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide		1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene		1	1.8	U
60-29-7	Diethyl ether		1	0.33	U
97-63-2	Ethyl methacrylate		1	1.3	U
637-92-3	Ethyl t-butyl ether		1	0.32	U
67-72-1	Hexachloroethane		11	0.11	U
591-78-6	2-Hexanone		11	5.0	U
126-98-7	Methacrylonitrile		11	2.3	U
78-93-3	Methyl ethyl ketone		1	3.3	U
74-88-4	Methyl iodide		1	1.1	בא ט
108-10-1	Methyl isobutyl ketone		11	2.4	U
80-62-6	Methyl methacrylate		1	1.2	U
76-01-7	Pentachloroethane		1	0.63	CN n
107-12-0	Propionitrile		1	6.2	U
109-99-9	Tetrahydrofuran		11	5.2	Ŭ
179601-23-1	p- & m-Xylenes		1	0.34	U
95-47-6	o-Xylene		1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.210	102	75 - 125	
Toluene-d8 (Surrogate)	10.000	8.7100	87.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.6400	96.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	210850	6.57	230753	6.57	
Chlorobenzene-d5 (IS)	76849	9.62	81486	9.61	
1,4-Difluorobenzene (IS)	317066	7.38	338008	7.38	

^{*} Values outside of QC limits

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-3

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

<u>1721091-09</u>

File ID:

04AUG21.D

Sampled:

08/01/17 11:30

Prepared:

Preparation:

Laboratory ID:

08/04/17 07:00

Analyzed:

08/04/17 16:58

Solids:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0384	Sequence:	<u>1713791</u>	Calibration:	<u>1707017</u>	Instrument:	MS-V5
CAS NO.	COMPOUND)		DILUTION	CC	NC. (ug/L)	Q
107-14-2	Chloroacetonitrile			1			U
109-69-3	1-Chlorobutane			1			U
513-88-2	1,1-Dichlorop	1,1-Dichloropropanone					U
96-33-3	Methyl acryla	Methyl acrylate					U
98-95-3	Nitrobenzene			1			U
79-46-9	2-Nitropropan	e		1			U

^{*} Values outside of QC limits

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-2

Laboratory:

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-10

File ID:

04AUG22.D 08/04/17 17:21

Sampled:

08/01/17 11:50

Prepared: <u>08/04/</u>

<u>08/04/17 07:00</u> Analyzed:

•

25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Solids:	Preparation: <u>Er</u>	A 3030 Water MS	Initial/Final: 23 ml / 23 ml	
Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U '
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	Ū



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-2

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-10</u>

File ID:

04AUG22.D

Sampled:

08/01/17 11:50

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 17:21

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Solids:	Freparation.	LIA 3030 Water MS		
Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-2

Laboratory:

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-10</u>

File ID:

04AUG22.D

Sampled:

08/01/17 11:50

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 17:21

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0384	Sequence:	<u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND			DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfic	de		1	0.48	U
110-57-6	trans-1,4-Dich	loro-2-butene		1	1.8	U
60-29-7	Diethyl ether			1	0.33	U
97-63-2	Ethyl methacry	ylate		1	1.3	U
637-92-3	Ethyl t-butyl et	ther		1	0.32	U
67-72-1	Hexachloroeth	ane		11	0.11	U
591-78-6	2-Hexanone			1	5.0	U
126-98-7	Methacrylonitr	rile		1	2.3	U
78-93-3	Methyl ethyl k	etone		1	3.3	U
74-88-4	Methyl iodide			1	1,1	U (U
108-10-1	Methyl isobuty	yl ketone		1	2.4	U
80-62-6	Methyl methac	erylate		1	1.2	U
76-01-7	Pentachloroeth	nane		1	0.63	UUJ
107-12-0	Propionitrile			1	6.2	U
109-99-9	Tetrahydrofura	an		1	5.2	U
179601-23-1	p- & m-Xylene	es		11	0.34	U
95-47-6	o-Xylene			1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.6900	96.9	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.0900	90.9	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.2600	92.6	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	205299	6.58	230753	6.57	
Chlorobenzene-d5 (IS)	73221	9.61	81486	9.61	
1,4-Difluorobenzene (IS)	296757	7.38	338008	7.38	

^{*} Values outside of QC limits

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-2

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-10</u>

File ID:

04AUG22.D

Sampled:

08/01/17 11:50

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 17:21

Solids:

25 ml / 25 ml

Datah.

BIH0384

Preparation:

EPA 5030 Water MS

Initial/Final: 1707017

Instrument MS-V5

Batch:	B[H0384	Sequence:	<u>1713791</u>	Calibration:	<u>1707017</u>	Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND			DILUTION	CC	ONC. (ug/L)	Q
107-14-2	Chloroacetonit	rile		1		· · · · · · · · · · · · · · · · · · ·	U
109-69-3	1-Chlorobutane	е		1			U
513-88-2	1,1-Dichloropr	opanone		1			U
96-33-3	Methyl acrylate	e		1			U
98-95-3	Nitrobenzene			1			U
79-46-9	2-Nitropropane	e		1			U

^{*} Values outside of QC limits

Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-5-3Q17

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

<u>1721091-11</u>

File ID:

04AUG23.D

Sampled:

08/01/17 12:00

Laboratory ID: Prepared:

08/04/17 07:00

Analyzed:

08/04/17 17:44

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Solids.	1 Toparation.	BITT 5050 Water WIS		
Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

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Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-5-3Q17

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID: Prepared:

1721091-11

File ID:

04AUG23.D

Sampled:

08/01/17 12:00

08/04/17 07:00 Analyzed:

08/04/17 17:44 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Solius:	rieparation.	1 JOJO Water IVIS	ilitial/Filiai. 25 mi / 25 mi	
Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	11	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	11	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	. 1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-5-3Q17

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-11

File ID:

04AUG23.D

Sampled:

08/01/17 12:00

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 17:44

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0384	Sequence:	<u>1713791</u>	Calibration:	<u>1707017</u>	Instrument:	MS-V5
CAS NO.	COMPOUND			DILUTION	CON	IC. (ug/L)	Q
75-15-0	Carbon disulfic	le		1		0.48	U
110-57-6	trans-1,4-Dichl	oro-2-butene		1		1.8	U
60-29-7	Diethyl ether			11		0.33	U
97-63-2	Ethyl methacry	late		1		1.3	U
637-92-3	Ethyl t-butyl et	her		11		0.32	U
67-72-1	Hexachloroetha	ane		11		0.11	U
591-78-6	2-Hexanone			11		5.0	U
126-98-7	Methacrylonitr	ile		1		2.3	U
78-93-3	Methyl ethyl ke	etone		1		3.3	U
74-88-4	Methyl iodide			11	<u> </u>	1.1	U 45
108-10-1	Methyl isobuty	l ketone		11		2.4	U
80-62-6	Methyl methac	rylate		1		1.2	U
76-01-7	Pentachloroeth	ane		11		0.63	UU
107-12-0	Propionitrile			1		6.2	U
109-99-9	Tetrahydrofura	n		1		5.2	U
179601-23-1	p- & m-Xylene	S		1		0.34	U
95-47-6	o-Xylene			11	<u> </u>	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.470	105	75 - 125	
Toluene-d8 (Surrogate)	10.000	8.8100	88.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.0200	90.2	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	203436	6.58	230753	6.57	
Chlorobenzene-d5 (IS)	74414	9.61	81486	9.61	
1,4-Difluorobenzene (IS)	301075	7.38	338008	7.38	

^{*} Values outside of QC limits

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

DUP-5-3Q17

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

Matrix:

Water

Laboratory ID:

1721091-11

File ID:

04AUG23.D

Sampled:

08/01/17 12:00

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 17:44

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
107-14-2	Chloroacetonitrile	1		U
109-69-3	1-Chlorobutane	1		U
513-88-2	1,1-Dichloropropanone	11		U
96-33-3	Methyl acrylate	11		Ŭ
98-95-3	Nitrobenzene	11		U
79-46-9	2-Nitropropane	11		U

^{*} Values outside of QC limits



Environmental Testing Laborator

Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-1

Laboratory:

Tidewater Inc.

3761 Attucks Drive Powell, OH 43065

BC Laboratories

SDG:

<u>17-21091</u>

Client:

Tidewater Inc.

08/01/17 12:50

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721091-12</u>

File ID:

04AUG24.D

Sampled:

water

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 18:07

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	111	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

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Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-1

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-12

File ID:

04AUG24.D

Sampled:

08/01/17 12:50

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 18:07 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Solids:	Preparation	n: <u>EPA 303</u>	0 Water MS	Initial/Final:	25 ml / 25 ml	
Batch:	<u>B[H0384</u> Sequence: <u>1</u>	713791	Calibration:	<u>1707017</u>	Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND		DILUTION	CON	C. (ug/L)	Q
563-58-6	1,1-Dichloropropene		1		0.19	U
10061-01-5	cis-1,3-Dichloropropene		1		0.14	U
10061-02-6	trans-1,3-Dichloropropene		1		0.13	U
100-41-4	Ethylbenzene		1		0.15	U
87-68-3	Hexachlorobutadiene		1		0.20	U
98-82-8	Isopropylbenzene		1		0.14	U
99-87-6	p-Isopropyltoluene		1		0.14	U
75-09-2	Methylene chloride		1		0.21	U
1634-04-4	Methyl t-butyl ether		1		0.14	U
91-20-3	Naphthalene		1		0.16	U
103-65-1	n-Propylbenzene		1		0.12	U
100-42-5	Styrene		1		0.12	U
630-20-6	1,1,1,2-Tetrachloroethane		1		0.21	U
79-34-5	1,1,2,2-Tetrachloroethane		1		0.17	U
127-18-4	Tetrachloroethene		1		0.23	U
108-88-3	Toluene		1		0.17	U
87-61-6	1,2,3-Trichlorobenzene		1		0.19	U
120-82-1	1,2,4-Trichlorobenzene		1		0.15	U
71-55-6	1,1,1-Trichloroethane		1		0.21	U
79-00-5	1,1,2-Trichloroethane		1		0.21	U
79-01-6	Trichloroethene		1		0.19	U
75-69-4	Trichlorofluoromethane		1		0.14	U
96-18-4	1,2,3-Trichloropropane		1		0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		1		0.19	U
95-63-6	1,2,4-Trimethylbenzene		1		0.17	U
108-67-8	1,3,5-Trimethylbenzene		1		0.14	U
75-01-4	Vinyl chloride		1		0.18	U
67-64-1	Acetone		1		6.6	U
107-13-1	Acrylonitrile		1		1.5	U
107-05-1	Allyl chloride		1		0.47	U
994-05-8	t-Amyl Methyl ether		1		0.19	U
75-65-0	t-Butyl alcohol		1		9.4	U

Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-1

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID: 1721091-12

File ID:

04AUG24.D

Sampled:

08/01/17 12:50

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 18:07

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	Ŭ
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	Ŭ
126-98-7	Methacrylonitrile	1	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	1	1.1	CNA
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	1	0.63	ששט
107-12-0	Propionitrile	11	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.34	U
95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	8.9500	89.5	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.3300	93.3	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7300	97.3	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	186961	6.58	230753	6.57	
Chlorobenzene-d5 (IS)	70099	9.61	81486	9.61	
1,4-Difluorobenzene (IS)	273784	7.38	338008	7.38	

^{*} Values outside of QC limits



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-11-1

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

3

File ID:

04AUG24.D

Sampled:

Prepared:

Preparation:

<u>1721091-12</u> <u>08/04/17 07:00</u>

Analyzed:

08/04/17 18:07

Solids:

08/01/17 12:50

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
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	11		U
98-95-3	Nitrobenzene	1		U
79-46-9	2-Nitropropane	1		U

^{*} Values outside of QC limits



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET **EPA-524.2**

EB-7-080117

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-13

File ID:

04AUG25.D 08/04/17 18:30

Sampled:

08/01/17 13:00

08/04/17 07:00 Analyzed:

25 ml / 25 ml

Solids:

Prepared: Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration: 1	Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	. U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U.
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	1 0.17	
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U

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Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-7-080117

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID: Prepared:

<u>1721091-13</u>

File ID:

<u>04AUG25.D</u>

Sampled:

08/01/17 13:00

08/04/17 07:00

Analyzed:

08/04/17 18:30 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U



Reported: 8/31/2017 11:08:10AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-7-080117

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-13

File ID:

04AUG25.D

Sampled:

08/01/17 13:00

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 18:30

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	atch: B[H0384 Sequence: 1713791 Calibration:		<u>1707017</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	1	0.33	U
97-63-2	Ethyl methacrylate	1	1.3	U
637-92-3	Ethyl t-butyl ether	11	0.32	U
67-72-1	Hexachloroethane	11	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	11	2.3	U
78-93-3	Methyl ethyl ketone	11	3.3	U
74-88-4	Methyl iodide	11	1.1	UUS
108-10-1	Methyl isobutyl ketone	1	2.4	U
80-62-6	Methyl methacrylate	11	1.2	U
76-01-7	Pentachloroethane	11	0.63	ひじ
107-12-0	Propionitrile	1	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.34	U
95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.580	106	75 - 125	
Toluene-d8 (Surrogate)	10.000	8.5600	85.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.640	106	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	203237	6.57	230753	6.57	
Chlorobenzene-d5 (IS)	70099	9.62	81486	9.61	
1,4-Difluorobenzene (IS)	302514	7.38	338008	7.38	

^{*} Values outside of QC limits

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Reported: 8/31/2017 11:08:10AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager. David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-7-080117

Laboratory:

BC Laboratories

SDG:

17-21091

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721091-13

File ID:

04AUG25.D

Sampled:

08/01/17 13:00

Prepared:

08/04/17 07:00

Analyzed:

08/04/17 18:30

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>BIH0384</u> Sequence: <u>1713791</u>	Calibration:	<u>1707017</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
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

^{*} Values outside of QC limits

VALIDATION COMPLETENESS WORKSHEET LDC #: 39394A1 Level III/IV SDG #: 17-21091 Laboratory: BC Laboratories, Inc.

Reviewer 2nd Reviewer

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
. l.	Sample receipt/Technical holding times	-A	
11.	GC/MS Instrument performance check	\triangle	
· III.	Initial calibration/ICV	AA	RSD = 2070. 82 101 = 380
IV.	Continuing calibration	w	RSO≤2070.82 1CN≤3590
V.	Laboratory Blanks	A	
VI.	Field blanks	NO	78=1. 2/3=/3
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	Ā	109
X.	Field duplicates	w	109 D=4+5. 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	&	Not reviewed for Level III validation.
XV.	Overall assessment of data	\blacksquare	

Note:

A = Acceptable

ND = No compounds detected

D = Duplicate

SB=Source blank OTHER:

N = Not provided/applicable

R = Rinsate FB = Field blank

TB = Trip blank EB = Equipment blank

SW = See worksheet ** Indicates sample was underwent Level IV review

	cates sample was underwent bever to review			
	Client ID	Lab ID	Matrix	Date
1	TB-7-080117	1721091-01	Water	08/01/17
2	MW-12-5	1721091-02	Water	08/01/17
3	MW-12-4**	1721091-03**	Water	08/01/17
4 1	MVV-12-3	1721091-04	Water	08/01/17
5	DUP-4-3Q17	1721091-05	Water	08/01/17
6	MVV-12-2	1721091-06	Water	08/01/17
7	MVV-12-1	1721091-07	Water	08/01/17
8	MVV-11-4	1721091-08	Water	08/01/17
9	MVV-11-3	1721091-09	Water	08/01/17
10 /	MVV-11-2	1721091-10	Water	08/01/17
11	DUP-5-3Q17	1721091-11	Water	08/01/17
12	MVV-11-1	1721091-12	Water	08/01/17
13	ÉB-7-080117	1721091-13	Water	08/01/17

LDC #: 39394A1 VALIDATION COMPLETENESS WORKSHEET SDG #: 17-21091 Level III/IV Laboratory: BC Laboratories, Inc. METHOD: GC/MS Volatiles (EPA Method 524.2)							Date: 9/14/1/ Page: 2012 Reviewer: 7 Reviewer: 1/2
	Client ID				Lab ID	Matrix	Date
14	MW-12-5MS				1721091-02 M S	Water	08/01/17
15	MW-12-5MSD				1721091-02 M SD	Water	08/01/17
16						·	
17							
18							
19							
20							
Note	S.						



VALIDATION FINDINGS CHECKLIST

Page: /of A Reviewer: 9 2nd Reviewer: 7

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?				·
Was cooler temperature criteria met?				
II. GC/MS Instrument performance check				
Was a tune check performed prior to establishing and/or re-establishing an initial calibration?				
Were the BFB performance results reviewed and found to be within the specified criteria?				
III. Initial calibration				
Did the laboratory perform at least 5 point calibration prior to sample analysis?				
Were all percent relative standard deviations (%RSD) ≤ 20%?				
IIIa. Initial Calibration Verification calibration				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	/			
Were all percent differences (%D) ≤ 30%?				
IV. Continuing calibration		ž.		
Was a continuing calibration standard analyzed at the beginning of each analysis batch?				
Were all percent differences (%D) of continuing calibration ≤ 30%?				
V.Laboratory Blanks		ı		
Was a laboratory blank associated with every sample in this SDG?				
Was a laboratory blank analyzed with each analysis batch?	/	<u> </u>		
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.				
VI. Field blanks				
Field blanks were identified in this SDG.				·
Target compounds were detected in the field blanks.				
VII. Surrogate spikes	1		d.	
Were all surrogate %R within the 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?				
VIII. Matrix spike/Matrix spike duplicates	20. 10. 10.			
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	/	1		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?				
IX. Laboratory control samples	T /	/ T	i i	
Was an LCS analyzed for this SDG?	/			

LDC #: 39394A

VALIDATION FINDINGS CHECKLIST

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

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per analytical batch?		/		
Were the LCS percent recoveries (%R) within 70-130%?				
X, Field duplicates				Belletine as a second of the s
Field duplicate pairs were identified in this SDG.				
Target compounds were detected in the field duplicates.				
XI Internal standards				
Were internal standard area counts within +/-30% of the area of the most recent continuing calibration standard and +/-50% of the average peak area in the initial calibration?				
Were retention times within +/-30 seconds of the associated calibration standard?				
XII. Compound quantitation/CRQLs	i e e ie			
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) or regression equations used to quantitate the compound?	/			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XIII. 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?				
XIV. System performance			197	
System performance was found to be acceptable.	/			
XV. Overall assessment of data				100 (100 m) (1
Overall assessment of data was found to be acceptable.				

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-lsopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. lodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Ťrichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methylcyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 393441

VALIDATION FINDINGS WORKSHEET Continuing Calibration

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".

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% ?

ſΫ		Cent differences (76D) < 30		Finding %D (Limit: ≤30.0%)		
#	Date	Standard ID	Compound	(Limit: <30.0%)	Associated Samples	Qualifications
	Date 8/4/17	0444403	Methyliodide	5/.8 33.9	All (NO)	VIND
		•	2222	33.9		1/1/
				•		0/
\vdash						
 						
						
 						
\vdash						



VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

METHOD: GCMS VOA (EPA Method 524.2)

	Concentra	tion (ug/L)	
Compound	44	5	RPD
0	0.40	0.32	22
K	0.78	0.63	21

V:\FIELD DUPLICATES\Field Duplicates\FD_Organics\2017\39394A1_JPL.wpd

LDC #: 39394A1

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

Page:_	of/_
Reviewer:	9
2nd Reviewer:	X

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

 $RRF = (A_x)(C_{is})/(A_{is})(C_x)$

average RRF = sum of the RRFs/number of standards %RSD = 100 * (S/X)

 A_{\star} = Area of compound,

A_{is} = Area of associated internal standard C_{is} = Concentration of internal standard

 C_x = Concentration of compound,

S = Standard deviation of the RRFs

X = Mean of the RRFs

			A - Wear of the RRI	l					
				Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	RRF (10 std)	RRF (10 std)	Average RRF (initial)	Average RRF (initial)	%RSD	%RSD
1	ICAL	7/20/17	K (1st internal standard)	0.7797252	0.7797252	0.7571101	0.7571101	5.641054	5.641053
ļ	(V5)		S (2nd internal standard)	0.3603684	0.3603684	0.3434012	0.3434012	3.079274	3.079306
			EE (3rd internal standard)	2.063766	2.063766	1.948304	1.948304	6.711166	6.711173
			BB (4th internal standard)						
2	•		K (1st internal standard)				-		
	·		S (2nd internal standard)						
			AA (3rd internal standard)						
			BB (4th internal standard)						
3		·	K (1st internal standard)						
			S (2nd internal standard)						
			AA (3rd internal standard)						
			BB (4th internal standard)						
4			K (1st internal standard)						
			S (2nd internal standard)	-					
			AA (3rd internal standard)						
			BB (4th internal standard)						

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 #: 39394A1

VALIDATION FINDINGS WORKSHEET <u>Continuing Calibration Results Verification</u>

Page:_	of
Reviewer:_	<u>'</u>
2nd Reviewer:	×

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF

RRF = continuing calibration RRF

 A_x = Area of compound, C = Concentration of compound A_{is} = Area of associated internal standard

 C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (R	eference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	04aug02	8/4/17	K	(1st internal standard)	0.7571101	0.7733756	0.7733756	2.1	2.1
			S	(2nd internal standard)	0.3434012	0.3649989	0.3649989	6.3	6.3
		·	EE	(3rd internal standard)	1.948304	2.011687	2.011687	3.3	3.3
			BB	(4th internal standard)					·
2			K	(5th internal standard)					
			S	(2nd internal standard)		9			
			AA	(3rd internal standard)					
			RR	(4th internal standard)					
3			QQQ	(1st internal standard)					
			S	(2nd internal standard)					
			AA	(3rd internal standard)				·	
			MMM	(4th internal standard)					
4			ВВ	(5th internal standard)					
			S	(2nd internal standard)					
			AA	(3rd internal standard)		1			
			BB	(4th internal standard)					

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.



VALIDATION FINDINGS WORKSHEET Surrogate Results Verification

Page:_	
Reviewer:	8
2nd reviewer:	
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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:__

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	10.000	9.81	98.1	98.	0
Bromofluorobenzene	/	9.16	91.6	916	1
1,2-Dichlorobenzene-d4		9.83	98.3	983	

Sample ID:

Dibromofluoromethane

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

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					

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates Results Verification

Page:_	
Reviewer:_	α
2nd Reviewer:_	OX.

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (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

SC = Sample concentration

RPD = IMSC - MSC I * 2/(MSC + MSDC)

MSC = Matrix spike concentration

SA = Spike added

MSDC = Matrix spike duplicate concentration

MS/MSD sample: 14/15

		Sp Ad	ike ded	Sample Concentration	Spiked S Concen	•	Matrix	Spike	Matrix Spike	Duplicate	M.S	S/MSD
Compound	<u> </u>	(pe	64	174	(/4)	60	Percent R	Recovery	Percent R	Recovery	l i	RPD
72	MS	s	MSD		MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	25!	œ	25,000	ND	29.760	26.350	119	119	105	105	122	η <u>.</u>
Trichloroethene		1			2T.320	26.70	109	109	105	105	4.15	4.15
Benzene					22850	24,750	914	914	97.0	97.0	5.94	5.94
Toluene					2(150	25,800	109	109	103	103	5.10	5.10
Chlorobenzene					22,550	22.730	40.	90°	90.9	70.9	0.795	

Comments: Refer to Matrix Spike/Matrix Spike Duplicate	s findings worksheet for list o	f qualifications and as	ssociated samples when re	ported results do not agree within 10.09
of the recalculated results.				

VALIDATION FINDINGS WORKSHEET Laboratory Control Sample Results Verification

Page:_	_ _ f_f
Reviewer:_	9
2nd Reviewer:	N

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory 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 = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

	Sp	oike	Spiked S	•	LC	:s	L	SD	L CS/	LCSD
Compound	Ad گر)	deal	Concent	tration	Percent i	Recovery	Percent F	Recovery	R	PD
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	25000	KN	26.790	NA	107	10T				
Trichloroethene		(25,T10		103	103				
Benzene			24:370		97.5	975				
Toluene	/		23.760	/	95.0	950	·			
Chlorobenzene	J.	V	23320	· /	93.3	93.3				

Comments:	Refer to Laboratory	Control Sample finding	s worksheet for list of	qualifications a	nd associated sa	mples when rep	orted results do i	not agree within 10	.0% of the
recalculated	results.								

LDC #:393944/

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page:_	
Reviewer:_	9
2nd reviewer:_	1

YN 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 = $\frac{(A_s)(I_s)(DF)}{(A_{ts})(RRF)(V_o)(\%S)}$ A_x = Area of the characteristic ion (EICP) for the compound to be measured A_{ts} = 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

only.

Percent solids, applicable to soils and solid matrices

Example:

Conc. = (4672) (10.00) () () () () (

#	Sample ID	Compound	Reported Concentration	Calculated Concentration ()	Qualification
	3	K	0.41		
		,			
			<u> </u>		
ļ					<u> </u>
		· · · ·			

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 21, 2017

Parameters:

Chromium

Validation Level:

Level III

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-21091

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-12-3	1721091-04	Water	08/01/17
DUP-4-3Q17	1721091-05	Water	08/01/17
MW-12-2	1721091-06	Water	08/01/17
MW-12-1	1721091-07	Water	08/01/17
MVV-11-3	1721091-09	Water	08/01/17
MW-11-2	1721091-10	Water	08/01/17
DUP-5-3Q17	1721091-11	Water	08/01/17
MVV-11-1	1721091-12	Water	08/01/17
EB-7-080117	1721091-13	Water	08/01/17
MW-12-3MS	1721091-04MS	Water	08/01/17
MW-12-3MSD	1721091-04MSD	Water	08/01/17
MW-12-3DUP	1721091-04DUP	Water	08/01/17

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chromium by Environmental Protection Agency (EPA) Method 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

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

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

IV. ICP Interference Check Sample Analysis

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

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium	1.2170 ug/L	All samples in SDG 17-21091
ICB/CCB	Chromium	0.1700 ug/L	DUP-4-3Q17 MW-12-2 MW-12-1 MW-11-3 MW-11-2 DUP-5-3Q17 MW-11-1 EB-7-080117

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-12-3	Chromium	1.8 ug/L	1.8U ug/L
DUP-4-3Q17	Chromium	2.4 ug/L	2.4U ug/L
MW-12-2	Chromium	1.9 ug/L	1.9U ug/L
MW-12-1	Chromium	2.9 ug/L	2.9U ug/L
MW-11-3	Chromium	2.9 ug/L	2.9U ug/L
MW-11-2	Chromium	2.1 ug/L	2.1U ug/L
DUP-5-3Q17	Chromium	2.0 ug/L	2.0U ug/L
MVV-11-1	Chromium	2.2 ug/L	2.2U ug/L
EB-7-080117	Chromium	2.4 ug/L	2.4U ug/L

VI. Field Blanks

Sample EB-7-080117 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration
EB-7-080117	Chromium	2.4 ug/L

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

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

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

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

XI. Field Duplicates

Samples MW-12-3 and DUP-4-3Q17 and samples MW-11-2 and DUP-5-3Q17 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentrat		
Analyte	MW-12-3	DUP-4-3Q17	RPD_
Chromium	1.8	2.4	29

	Concentration (ug/L)		
Analyte	MW-11-2	DUP-5-3Q17	RPD
Chromium	2.1	2.0	5

XII. Internal Standards (ICP-MS)

Raw data were not reviewed for Level III validation.

XIII. Sample Result Verification

Raw data were not reviewed for Level III validation.

XIV. Overall Assessment of Data

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

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

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NASA JPL, 3Q2017 Chromium - Data Qualification Summary - SDG 17-21091

No Sample Data Qualified in this SDG

NASA JPL, 3Q2017 Chromium - Laboratory Blank Data Qualification Summary - SDG 17-21091

Sample	Analyte	Modified Final Concentration	A or P
MW-12-3	Chromium	1.8U ug/L	А
DUP-4-3Q17	Chromium	2.4U ug/L	А
MW-12-2	Chromium	1.9U ug/L	А
MW-12-1	Chromium	2.9U ug/L	А
MW-11-3	Chromium	2.9U ug/L	А
MW-11-2	Chromium	2.1U ug/L	Α
DUP-5-3Q17	Chromium	2.0U ug/L	А
MW-11-1	Chromium	2.2U ug/L	А
EB-7-080117	Chromium	2.4U ug/L	А

Reported: 8/31/2017 11:54:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-200.8**

MW-12-3

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: 1721091-04

File ID: PE-EL3 170803R-181

Sampled: <u>08/01/17 08:15</u>

Prepared: 08/03/17 11:00

Analyzed: 08/04/17 03:12

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0281</u>

Sequence:

1713866

Calibration: <u>UNASSIGNED</u>

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

Reported: 8/31/2017 11:54:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

DUP-4-3Q17

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-05</u>

File ID: PE-EL3_170803R-189

Sampled: 08/01/17 08:25

Prepared: 08/03/17 11:00

Analyzed: 08/04/17 03:39

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0281</u>

Sequence: <u>1713866</u>

Calibration: <u>UNASSIGNED</u>

Instrument: PE-EL3

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.4 U	1	J	EPA-200.8

M93117

Reported: 8/31/2017 11:54:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-12-2

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-06</u>

File ID: PE-EL3 170803R-190

Sampled: <u>08/01/17 09:15</u>

Prepared: 08/03/17 11:00

Analyzed: 08/04/17 03:43

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: B[H0281

Sequence:

<u>1713866</u> Calibra

Calibration: <u>UNASSIGNED</u>

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

Reported: 8/31/2017 11:54:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-12-1

Laboratory: BC Laboratories

SDG: 17-21091

Client:

Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix:

08/01/17 09:45

Laboratory ID: <u>1721091-07</u>

File ID: PE-EL3 170803R-191

Sampled:

Water

Preparation: EPA 200.2

Prepared: 08/03/17 11:00

Analyzed: 08/04/17 03:46 Initial/Final: 50 ml / 50 ml

Solids: <u>0.00</u>

Batch: <u>B[H0281</u>

Sequence:

1713866

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.9 U	1	J	EPA-200.8

Reported: 8/31/2017 11:54:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-200.8**

MW-11-3

Laboratory: BC Laboratories

SDG: 17-21091

Client: <u>Tidewater Inc.</u>

Project: JPL- GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-09</u>

File ID: PE-EL3 170803R-192

Sampled: 08/01/17 11:30

Prepared: 08/03/17 11:00

Analyzed: 08/04/17 03:50

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: B[H0281

Sequence:

1713866

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.9 V	1	J	EPA-200.8

Reported: 8/31/2017 11:54:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-200.8**

MW-11-2

Laboratory: BC Laboratories

SDG: 17-21091

Client:

Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-10</u>

File ID: PE-EL3 170803R-193

Sampled: 08/01/17 11:50

Prepared:

08/03/17 11:00

Analyzed: 08/04/17 03:53

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0281</u>

Sequence:

1713866

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.1 V	1	J	EPA-200.8

Reported: 8/31/2017 11:54:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-200.8**

DUP-5-3Q17

Laboratory: BC Laboratories

SDG: 17-21091

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-11</u>

File ID: PE-EL3_170803R-194

Sampled: 08/01/17 12:00

Prepared: 08/03/17 11:00

Analyzed: 08/04/17 03:56

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0281</u>

Sequence:

1713866

Calibration: <u>UNASSIGNED</u>

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



Reported: 8/31/2017 11:54:52AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-200.8**

MW-11-1

Laboratory: BC Laboratories

SDG: 17-21091

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-12</u>

File ID: PE-EL3 170803R-195

Sampled: 08/01/17 12:50

Batch: <u>B[H0281</u>

Prepared: 08/03/17 11:00

Analyzed: 08/04/17 04:00

Solids: <u>0.00</u>

Preparation: EPA 200.2

1713866

Sequence:

Initial/Final: 50 ml / 50 ml Calibration: <u>UNASSIGNED</u>

Instrument: PE-EL3

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

209111

Reported: 8/31/2017 11:54:52AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

EB-7-080117

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-13</u>

File ID: PE-EL3 170803R-196

Sampled: <u>08/01/17 13:00</u>

Prepared: 08/03/17 11:00

Analyzed: <u>08/04/17 04:03</u>

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: B[H0281

Sequence: <u>1713866</u>

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	2.4 U	1	J	EPA-200.8

VALIDATION COMPLETENESS WORKSHEET LDC #: 39394A4a SDG #: 17-21091

Level III

Date: <u>0</u> 9	15	ľ
Page: <u>l</u> of	1	
Reviewer: #1	_	
2nd Reviewer: 13		

Laboratory: BC Laboratories, Inc.

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
1.	Sample receipt/Technical holding times	AIA	
11.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	SW/	
VI.	Field Blanks	SW	9=EB
VII.	Matrix Spike/Matrix Spike Duplicates	A	
VIII.	Duplicate sample analysis	A	·
IX.	Serial Dilution	N	
Χ.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	(1,2), (6,7)
XII.	Internal Standard (ICP-MS)	N.	
XIII.	Sample Result Verification	N	
LXIV	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-12-3	1721091-04	Water	08/01/17
2	DUP-4-3Q17	1721091-05	Water	08/01/17
3	MW-12-2	1721091-06	Water	08/01/17
4	MW-12-1	1721091-07	Water	08/01/17
5	MW-11-3	1721091-09	Water	08/01/17
6	MW-11-2	1721091-10	Water	08/01/17
7	DUP-5-3Q17	1721091-11	Water	08/01/17
8	MW-11-1	1721091-12	Water	08/01/17
9	EB-7-080117	1721091-13	Water	08/01/17
10	MW-12-3MS	1721091-04MS	Water	08/01/17
11	MW-12-3MSD	1721091-04 M SD	Water	08/01/17
12	MW-12-3DUP	1721091-04DUP	Water	08/01/17
13				
14				

Notes:

LDC #: 39394A4a

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: NA
Associated Samples: All

Page: 1 of 1

Reviewer: ATL 2nd Reviewer: 33

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: _ug/L ___

											Autorität		
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)		1	2	3	4	5	6	7	8	9
Cr		1.2170		6.085	1.8	2.4	1.9	2.9	2.9	2.1	2.0	2.2	2.4

Sample Concentration units, unless otherwise noted: ug/L Associated Samples: 2 to 9											
		in the second							And the second s		
Analyte	Maximum PB ^a (mg/Kg)	PB ^a	Maximum ICB/CCB ^a (ug/L)		·						
Cr			0.1700	0.85							

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 #: 39394A4a	
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VALIDATION FINDINGS WORKSHEET <u>Field Blanks</u>

Page: <u>1</u> of <u>1</u>	
Reviewer: ATL	
2nd Reviewer: 🕊	

METHOD: Trace Metals (EPA SW846 6010B/7000)

Blank units: ug/L Associated sample units: ug/L Sampling date: 08/01/17 Soil factor applied ______

Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: X report

Analyte Blank ID Sample Identification

Analyte	Blank ID			Sa	mple Identifica	ation		
144		Action Limit						
Cr	2.4	12 U³						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC#:	39394A4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:_1of_	_1_
Reviewer:_ATL	
2nd Reviewer: 12	

METHOD: Metals (EPA Method 6010B/6020A7000)

	Concentra				
Analyte	1	2	RPD		
Chromium	1.8	2.4	29		

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2017\39394A4a.wpd

	Concentra			
Analyte	6	7	RPD	
Chromium	2.1	2.0	5	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 21, 2017

Parameters:

Wet Chemistry

Validation Level:

Level III & IV

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-21091

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-12-5	1721091-02	Water	08/01/17
MW-12-4**	1721091-03**	Water	08/01/17
MW-12-3	1721091-04	Water	08/01/17
DUP-4-3Q17	1721091-05	Water	08/01/17
MW-12-2	1721091-06	Water	08/01/17
MW-12-1	1721091-07	Water	08/01/17
MW-11-4	1721091-08	Water	08/01/17
MW-11-3	1721091-09	Water	08/01/17
MW-11-2	1721091-10	Water	08/01/17
DUP-5-3Q17	1721091-11	Water	08/01/17
MVV-11-1	1721091-12	Water	08/01/17
EB-7-080117	1721091-13	Water	08/01/17
MW-12-5MS	1721091-02MS	Water	08/01/17
MW-12-5MSD	1721091-02MSD	Water	08/01/17
MW-12-5DUP	1721091-02DUP	Water	08/01/17
MW-12-3MS	1721091-04MS	Water	08/01/17
MW-12-3MSD	1721091-04MSD	Water	08/01/17
MW-12-3DUP	1721091-04DUP	Water	08/01/17
MW-11-1MS	1721091-12MS	Water	08/01/17
MW-11-1MSD	1721091-12MSD	Water	08/01/17
MW-11-1DUP	1721091-12DUP	Water	08/01/17

^{**}Indicates sample underwent Level IV validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

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

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

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

III. Continuing Calibration

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

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Nitrite as Nitrogen	0.012671 mg/L	MVV-11-1
ICB/CCB	Nitrite as Nitrogen	0.013528 mg/L	MW-11-1

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-11-1	Nitrite as Nitrogen	0.022 mg/L	0.022U mg/L

V. Field Blanks

Sample EB-7-080117 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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

Samples MW-12-3 and DUP-4-3Q17 and samples MW-11-2 and DUP-5-3Q17 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concent		
Analyte	MW-12-3	DUP-4-2Q17	RPD
Perchlorate	3.2	2.9	10

X. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

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

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

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NASA JPL, 3Q2017 Wet Chemistry - Data Qualification Summary - SDG 17-21091

No Sample Data Qualified in this SDG

NASA JPL, 3Q2017 Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 17-21091

Sample	Compound	Modified Final Concentration	A or P
MW-11-1	Nitrite as Nitrogen	0.022U mg/L	Α



Reported: 8/31/2017 11:11:15AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-300.0

MW-11-1

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-12</u>

File ID: E080117.seq-45

Sampled: 08/01/17 12:50

Prepared: 08/01/17 18:00

Analyzed: 08/02/17 07:50

Solids: <u>0.00</u>

Preparation: No Prep 1714072

Initial/Final: 20 ml / 20 ml

Batch: B[H0197

Sequence:

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	21	1		EPA-300.0
14797-55-8	Nitrate as N	0.53	1		EPA-300.0
14808-79-8	Sulfate	41	1		EPA-300.0

Reported: 8/31/2017 11:11:15AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-353.2

MW-11-1

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: Tidewater Inc.

Project: JPL- GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-12</u>

File ID: <u>170802 0752 NO2-025</u>

Sampled: 08/01/17 12:50

Prepared: <u>08/02/17 07:52</u>

Analyzed: 08/02/17 08:14

Solids: <u>0.00</u>

Preparation: No Prep

rrep

Initial/Final: 20 ml / 20 ml

Batch: B[H0292

Sequence:

1713792

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (mg/L)		Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.022	1	1	J	EPA-353.2



Reported: 8/31/2017 11:11:15AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-365.1**

MW-11-1

Laboratory: BC Laboratories

SDG: 17-21091

Client:

Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-12</u>

File ID: 170802 0839 PO4-045

Sampled: <u>08/01/17 12:50</u>

Prepared: 08/02/17 08:39

Analyzed: 08/02/17 08:39

Solids:

0.00

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0288</u>

Sequence:

1713795

Calibration: UNASSIGNED

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

Reported: 8/31/2017 11:11:15AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-12-3

Laboratory: BC Laboratories

SDG: 17-21091

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water Laboratory ID: <u>1721091-04</u>

File ID: 170801 2142 CR6-005

08/01/17 08:15 Sampled:

Prepared: 08/01/17 21:42

Analyzed: 08/01/17 21:42

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0140</u>

1713713 Sequence:

Calibration: <u>UNASSIGNED</u>

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





Reported: 8/31/2017 11:11:15AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

DUP-4-3Q17

Laboratory: BC Laboratories

SDG: 17-21091

Project: JPL-GW Monitoring Wells

Client:

Tidewater Inc.

Matrix: Water

Laboratory ID: <u>1721091-05</u>

File ID: 170801 2142 CR6-009

Sampled: 08/01/17 08:25

Prepared: 08/01/17 21:42

Analyzed: 08/01/17 21:42

Solids: 0.00 Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0140

Sequence:

1713713

Calibration: <u>UNASSIGNED</u>

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



Reported: 8/31/2017 11:11:15AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-12-2

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-06</u>

File ID: 170801 2142 CR6-028

Sampled: <u>08/01/17 09:15</u>

Prepared: 08/01/17 21:42

Analyzed: 08/01/17 22:41

Solids: <u>0.00</u>

Preparation: No Prep

Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0140</u>

Sequence: <u>1713713</u>

Calibration: <u>UNASSIGNED</u>

Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0014	2	UD	EPA-7196

Sugging

Reported: 8/31/2017 11:11:15AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-12-1

Laboratory: BC Laboratories

SDG: 17-21091

Client: <u>Tidewater Inc.</u>

Matrix: Water

Project: JPL-GW Monitoring Wells

File ID: 170801 2142 CR6-011

Sampled:

08/01/17 09:45

Laboratory ID: <u>1721091-07</u>

Analyzed: 08/01/17 21:43

Solids: <u>0.00</u>

Preparation: No Prep

Prepared:

08/01/17 21:42

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0140</u>

Sequence:

1713713

Calibration: <u>UNASSIGNED</u>

Instrument: KONE-1

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

TOGH17



Reported: 8/31/2017 11:11:15AM
Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-11-3

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: <u>Tidewater Inc.</u>

Project: JPL- GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-09</u>

File ID: 170801 2142 CR6-012

Sampled: <u>08/01/17 11:30</u>

Prepared: 08/01/17 21:42

Analyzed: 08/01/17 21:43

Solids: <u>0.00</u>

Preparation: No Prep

ħ

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0140</u>

Sequence: <u>1713713</u>

Calibration: <u>UNASSIGNED</u>

Instrument: KONE-1

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

Stognin



Reported: 8/31/2017 11:11:15AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-11-2

Laboratory: BC Laboratories

SDG: 17-21091

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-10</u>

File ID: 170801 2142 CR6-015

Sampled: <u>08/01/17 11:50</u>

Prepared: 08/01/17 21:42

Analyzed: 08/01/17 21:46

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0140</u>

<u>1713713</u>

Sequence:

Calibration: <u>UNASSIGNED</u>

Instrument: KONE-1

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

8092117

Reported: 8/31/2017 11:11:15AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

DUP-5-3Q17

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-11</u>

File ID: 170801 2142 CR6-016

Sampled: 08/01/17 12:00

Prepared: 08/01/17 21:42

Analyzed: 08/01/17 21:46

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0140

Sequence: <u>1713713</u>

Calibration: UNASSIGNED

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



Reported: 8/31/2017 11:11:15AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-7196**

MW-11-1

Laboratory: BC Laboratories

SDG: 17-21091

Client:

Tidewater Inc.

08/01/17 12:50

Project: JPL-GW Monitoring Wells

Matrix:

Laboratory ID: <u>1721091-12</u>

File ID: 170801 2142 CR6-017

Sampled:

Water

Prepared: 08/01/17 21:42

Analyzed: 08/01/17 21:46

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0140</u>

Sequence:

1713713

Calibration: <u>UNASSIGNED</u>

Instrument: KONE-1

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

BC Laboratories, Inc, Page 101 of 118



Reported: 8/31/2017 11:11:15AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

EB-7-080117

Laboratory: BC Laboratories

SDG: 17-21091

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-13</u>

File ID: 170801 2142 CR6-018

Sampled: 08/01/17 13:00

Prepared: 08/01/17 21:42

Analyzed: 08/01/17 21:46

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0140

Sequence: <u>1713713</u>

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

Story17

Tidewater Inc. 3761 Attucks Drive

Powell, OH 43065



Reported: 8/31/2017 11:13:18AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-12-5

Laboratory: BC Laboratories

SDG: 17-21091

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-02</u>

File ID: F081117.seq-11.0000.txt

Sampled: 08/01/17 07:30

Prepared: 08/11/17 14:00

Solids: <u>0.00</u>

Preparation: No Prep

Analyzed: <u>08/11/17 16:40</u> Initial/Final: 20 ml / 20 ml

Batch: <u>B[H1247</u>

1714506 Sequence:

Calibration: UNASSIGNED

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

Reported: 8/31/2017 11:13:18AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-12-4

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: Tidewater Inc.

Matrix: Water

Project: JPL-GW Monitoring Wells

File ID: F081117.seq-15.0000.txt

Sampled: 08/01/17 08:00

Laboratory ID: <u>1721091-03</u> Prepared: 08/11/17 14:00

Analyzed: 08/11/17 17:36

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H1247

Sequence:

1714506

Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.6	1	J	EPA-314.0



Reported: 8/31/2017 11:13:18AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-12-3

Laboratory: BC Laboratories

SDG: 17-21091

Client:

Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-04</u>

File ID: F081117.seq-16.0000.txt

Sampled:

08/01/17 08:15

Prepared: 08/11/17 14:00

Analyzed: 08/11/17 17:49

Solids:

0.00

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H1247

Sequence:

1714506

Calibration: <u>UNASSIGNED</u>

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



Reported: 8/31/2017 11:13:18AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

DUP-4-3Q17

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-05</u>

File ID: F081117.seq-19.0000.txt

Sampled: 08/01/17 08:25

Prepared: 08/11/17 14:00

Analyzed: 08/11/17 18:31

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H1247

Sequence: <u>1714506</u>

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	2.9	1	J	EPA-314.0



Reported: 8/31/2017 11:13:18AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-12-2

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1721091-06</u>

File ID: F081117.seq-20.0000.txt

Sampled: <u>08/01/17 09:15</u>

Prepared: 08/11/17 14:00

Solids: 0.00 Preparation: No Prep

Analyzed: 08/11/17 18:45 Initial/Final: 20 ml / 20 ml

Batch: B[H1247

1714506

Sequence:

Calibration: UNASSIGNED

Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0

809217



Reported: 8/31/2017 11:13:18AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-12-1

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-07</u>

File ID: F081117.seq-21.0000.txt

Sampled: <u>08/01/17 09:45</u>

Prepared: 08/11/17 14:00

Analyzed: 08/11/17 18:59

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H1247</u> Sequence: <u>1714506</u> Calibration: <u>UNASSIGNED</u> Instrument: <u>IC6</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0



Reported: 8/31/2017 11:13:18AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-11-4

Laboratory: BC Laboratories

SDG: 17-21091

Calibration: <u>UNASSIGNED</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-08</u>

File ID: F081117.seq-22.0000.txt

Sampled: 08/01/17 11:00

Batch: <u>B[H1247</u>

Prepared: 08/11/17 14:00

Analyzed: 08/11/17 19:13

Solids: <u>0.00</u>

Preparation: No Prep

1714506

Sequence:

Initial/Final: 20 ml / 20 ml

Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.94	1	J	EPA-314.0

809417



Reported: 8/31/2017 11:13:18AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-11-3

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-09</u>

File ID: F081117.seq-23.0000.txt

Sampled: 08/01/17 11:30

Prepared: 08/11/17 14:00

Analyzed: 08/11/17 19:26

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H1247</u>

1714506

Sequence:

Calibration: UNASSIGNED

Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0

SO MIN

Reported: 8/31/2017 11:13:18AM

Project: JPL-GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-314.0**

MW-11-2

Laboratory: BC Laboratories

SDG: 17-21091

Tidewater Inc. Client:

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-10</u>

File ID: F081117.seq-24.0000.txt

Sampled: 08/01/17 11:50

Prepared: 08/11/17 14:00

Analyzed: 08/11/17 19:40

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H1247

1714506 Sequence:

Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0



Reported: 8/31/2017 11:13:18AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

DUP-5-3Q17

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-11</u>

File ID: F081117.seq-25.0000.txt

Sampled: 08/01/17 12:00

Prepared: 08/11/17 14:00

Analyzed: 08/11/17 19:54

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H1247

Sequence: <u>1714506</u>

Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0



Reported: 8/31/2017 11:13:18AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-314.0**

MW-11-1

Laboratory: BC Laboratories

SDG: 17-21091

Client:

Tidewater Inc.

Matrix:

Project: JPL-GW Monitoring Wells

Sampled: 08/01/17 12:50

Water

Laboratory ID: <u>1721091-12</u>

Prepared: 08/11/17 14:00

File ID: F081117.seq-26.0000.txt

Preparation: No Prep

1714506

Analyzed: 08/11/17 20:08 Initial/Final: 20 ml / 20 ml

Solids: <u>0.00</u>

Batch: B[H1247

Sequence:

Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.71	1	J	EPA-314.0

Reported: 8/31/2017 11:13:18AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

EB-7-080117

Laboratory: BC Laboratories

SDG: <u>17-21091</u>

Calibration: UNASSIGNED

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721091-13</u>

File ID: F081117.seq-27.0000.txt

Sampled: <u>08/01/17 13:00</u>

Batch: BIH1247

Prepared: 08/11/17 14:00

Analyzed: <u>08/11/17 20:22</u>

Solids: <u>0.00</u>

Preparation: <u>No Prep</u>

<u>1714506</u>

Sequence:

ջ .

Initial/Final: 20 ml / 20 ml

Instrument: IC6

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0

Scog2117

_____ VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: <u>9115/1</u> 7
Page: 1_of_2
Reviewer: ATU
2nd Reviewer: 48

SDG #: 17-21091 Laboratory: <u>BC Laboratories</u>, Inc.

LDC #: 39394A6

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA SW846 Method 7196), Orthophosphate-P (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
1.	Sample receipt/Technical holding times	AIA	
Ш	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	3W	
V	Field blanks	MD	12=EB
VI.	Matrix Spike/Matrix Spike Duplicates	A	·
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	3W	(3,4); (9,10)
X.	Sample result verification	A	Not reviewed for Level III validation.
XL	Overall assessment of data	A.	

Note:

A = Acceptable

ND = No compounds detected

d D = Duplicate

SB=Source blank

N = Not provided/applicable SW = See worksheet R = Rinsate FB = Field blank TB = Trip blank
EB = Equipment blank

OTHER:

** Indicates sample was underwent Level IV review

	Client ID	Lab ID	Matrix	Date
1	MW-12-5	1721091-02	Water	08/01/17
2	MW-12-4**	1721091-03**	Water	08/01/17
3	MW-12-3	1721091-04	Water	08/01/17
4	DUP-4-3Q17	1721091-05	Water	08/01/17
5	MW-12-2	1721091-06	Water	08/01/17
6	MW-12-1	1721091-07	Water	08/01/17
7	MW-11-4	1721091-08	Water	08/01/17
8	MVV-11-3	1721091-09	Water	08/01/17
9	MVV-11-2	1721091-10	Water	08/01/17
10	DUP-5-3Q17	1721091-11	Water	08/01/17
11	MVV-11-1	1721091-12	Water	08/01/17
12	EB-7-080117	1721091-13	Water	08/01/17
13	MW-12-5MS	1721091-02MS	Water	08/01/17
14	MW-12-5MSD	1721091-02MSD	Water	08/01/17
15	MW-12-5DUP	1721091-02DUP	Water	08/01/17
16	MW-12-3MS	1721091-04MS	Water	08/01/17
17	MW-12-3MSD	1721091-04MSD	Water	08/01/17

LDC	#: <u>39394A6</u>	Ī	Date: <u>0</u> 9		
SDG	6 #: <u>17-21091</u>	Level I	II/IV		Page: <u>2</u> of
Labo	oratory: <u>BC Laborator</u>	ries, Inc.			Reviewer: 41
		oride, Nitrate-N, Sulfate (EPA Method 3 96), Orthophosphate-P (EPA Method 3			avalent Chrom
	Client ID		Lab ID	Matrix	Date
18	MW-12-3DUP		1721091-04DUP	Water	08/01/17
19	MW-11-1MS		1721091-12MS	Water	08/01/17
20	MW-11-1MSD		1721091-12MSD	Water	08/01/17
21	MW-11-1DUP		1721091-12DUP	Water	08/01/17
	,		ļ.	1	

Notes:	

 LDC#: 39394A6

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2 Reviewer: 410 2nd Reviewer: 33

Method:Inorganics (EPA Method ເປ ເວນ ຄົນ)				
Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	V			
II. Calibration				
Were all instruments calibrated daily, each set-up time?		_		
Were the proper number of standards used?	V			
Were all initial calibration correlation coefficients ≥ 0.995?	\checkmark			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	\checkmark			
Were titrant checks performed as required? (Level IV only)			V	
Were balance checks performed as required? (Level IV only)			<u> </u>	
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.	\checkmark			
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.	\checkmark			
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.	\checkmark			
Were the MS/MSD or duplicate relative percent differences (RPD) \leq 20% for waters and \leq 35% for soil samples? A control limit of \leq CRDL(\leq 2X CRDL for soil) was used for samples that were \leq 5X the CRDL, including when only one of the duplicate sample values were \leq 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	1			
Was an LCS analyzed per extraction batch?	V			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	V			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		\checkmark		
Were the performance evaluation (PE) samples within the acceptance limits?				

LDC#: 39394AG

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2 Reviewer: 410 2nd Reviewer: 38

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?	\checkmark			
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.		$\sqrt{}$		

LDC #: 39394AG

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: 1 of 1

Reviewer: ATC

2nd reviewer: 18

All circled methods are applicable to each sample.

Sample ID	Parameter
11	ph TDS(CI) F (NO) (NO) (SO) (6-PO) AIK CN NH ₃ TKN TOC Cr6+ CIO ₄
3+6,8+12	PH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC C16+ C104
1-12	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ AIK CN NH ₃ TKN TOC Cr6+(CIO ₄)
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
QC	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ AIK CN NH ₃ TKN TOC Cr6+ CIO ₄
19,20,21	PH TDS CI F NO3 (NO) SO4(O-PO) AIK CN NH3 TKN TOC Cr6+ CIO4
1C,17,18	PH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
13,14,15	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ AIK CN NH ₃ TKN TOC Cr6+CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CLF NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CLF NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CLF NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CLF NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
:	pH TDS CLF NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CLF NO ₂ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₂ TKN TOC Cr6+ ClO ₄

Comments:		

LDC #: 39394A6

VALIDATION FINDINGS WORKSHEET Blanks

Page:_	1	_of_1	
Reviewer: <i>A</i>	١T	L	
nd Reviewer		B	-

METHOD:Inorganics, Method See Cover

Conc. units: mg/L Associated Samples: 11

Analyte	Blank ID	Blank ID	Blank						
	РВ	ICB/CCB (mg/L)	Action Limit	11				·	
Nitrite as N	0.012671		0.063355	0.022					
Nitrite as N		0.013528	0.06764	see above					

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#<u>39394A6</u>

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:_1of_1	
Reviewer:ATL	
2nd Reviewer: 🗸 😼	

Inorganics: Method See Cover

	Concentra			
Analyte	3	44	RPD	
Perchlorate	3.2	2.9	10	

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2017\39394A6.wpd

LDC #: 39394A6

Validation Findings Worksheet Initial and Continuing Calibration Calculation Verification

Page:	of_	1
Reviewer:_	ATT	
2nd Reviewe	er: 🗸	ß

Method:	Inorganics,	Method	See Cover	

The correlation coefficient (r) for the calibration of Clou was recalculated.Calibration date: 12 0 1 1 7

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

%R = <u>Found X 100</u>

Where,

Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True

True = concentration of each analyte in the ICV or CCV source

					Recalculated	Reported	Acceptable
Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	r or r ²	r orr ²	(Y/N)
Initial calibration		s 1	0.0	0.0001			
		s2	2	0.0024	0.99942	0.99986	
	0104	s3	4	0.0044			Y
	0104	s4	6	0.007			
		s5	10	0.0119			
		s6	20	0.0243			
TCV (8/11 @ 15:17) Calibration verification	c104 ⁻	70VIVD 9.1773	TRUE 10,000		91.8	92.2	Y
CCV _I (8 @ 8:03) Calibration verification	C104 ⁻	10.8205	10.000		108.2	110	У
$CCV_2(8 11@22:33)$ Calibration verification	cl 04	9.1773	10'00)		91.8	95.6	У

Comments: Refer to Calibration Veri	fication findings worksheet for lis	st of qualifications and associa	ted samples when reported	results do not agree within
10.0% of the recalculated results				· · · · · · · · · · · · · · · · · · ·

LDC #: 39394A6

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page:of	1
Reviewer: AT	レ
2nd Reviewer: 😘	

METHOD: Inorganics, Method	see cover
----------------------------	-----------

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

 $%R = Found \times 100$

Where,

Found =

concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,

True 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:

 $RPD = \underline{[S-D]} \times 100$

Where,

S =

Original sample concentration

(S+D)/2

D =

Duplicate sample concentration

			(Mg/L) Found/S	(Mg/L) True/D	Recalculated	Reported	Acceptable
Sample ID	Type of Analysis	Element	(units)	(units)	%R / RPD	%R / RPD	(Y/N)
LCS	Laboratory control sample	C104	9.133	10	91.3	89.5	У
MS 13	Matrix spike sample (8/11 © 17.08)	Cl04-	(SSR-SR) 9,754	10.101	96.6	96.8	Y
MS/MSD 13/14	Duplicate sample	Cl04	13.285	12.461	6.41	4.99	ý

Comments:		 	 	
	 	 	 	

LDC #: 39394 AG

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page:	of
Reviewer:_	ATU
2nd reviewer:_	16

METHOD: Inor	ganics, Method3	ze cover	
Please see qua Y N N/A Y N N/A Y N N/A	Have results been re Are results within the	all questions answered "N". Not applica eported and calculated correctly? e calibrated range of the instruments? its below the CRQL?	ble questions are identified as "N/A".
	alyte) results for d verified using the fo		reported with a positive detect were
Concentration =		Recalculation:	

AX 830, 28416209

 $0.00261 \times 830.28416209 = 2.167$

#	Sample ID	Analyte	Reported Concentration (MgL)	Calculated Concentration (Mg/L) 2, 2	Acceptable (Y/N)
	2	C10y-	2.6	2,2	4
			.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		/
-					
				·	
			-		
	·				

Note:	 	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 21, 2017

Parameters:

Volatiles

Validation Level:

Level III

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-21528

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-9-080317	1721528-01	Water	08/03/17
MW-10	1721528-02	Water	08/03/17
MW-16	1721528-03	Water	08/03/17
MVV-7	1721528-04	Water	08/03/17
EB-9-080317	1721528-05	Water	08/03/17
MW-10MS	1721528-02MS	Water	08/03/17
MW-10MSD	1721528-02MSD	Water	08/03/17
MW-16MS	1721528-03MS	Water	08/03/17
MW-16MSD	1721528-03MSD	Water	08/03/17

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-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r²) were greater than or equal to 0.990.

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

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
08/08/17	Bromomethane Methyl iodide Pentachloroethane	32.6 (≤30) 52.1 (≤30) 36.2 (≤30)	TB-9-080317 MW-10 MW-7 EB-9-080317	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	Р
08/08/17	Methyl iodide Pentachloroethane	54.1 (≤30) 41.0 (≤30)	MW-16	UJ (all non-detects) UJ (all non-detects)	Р

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-9-080317 was identified as a trip blank. No contaminants were found.

Sample EB-9-080317 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

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

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Level III validation.

XIV. System Performance

Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

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

Due to continuing calibration %D, data were qualified as estimated in five samples.

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

NASA JPL, 3Q2017 Volatiles - Data Qualification Summary - SDG 17-21528

Sample	Compound	Flag	A or P	Reason
TB-9-080317 MW-10 MW-7 EB-9-080317	Bromomethane Methyl iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	Р	Continuing calibration (%D)
MW-16	Methyl iodide Pentachloroethane	UJ (all non-detects) UJ (all non-detects)	Р	Continuing calibration (%D)

NASA JPL, 3Q2017 Volatiles - Laboratory Blank Data Qualification Summary - SDG 17-21528

No Sample Data Qualified in this SDG



Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-9-080317

Laboratory:

BC Laboratories

SDG:

17-21528

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721528-01

File ID:

<u>07AUG46.D</u>

Sampled:

08/03/17 07:00

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 05:13

Solids:

Preparation:

EPA 5030 Water MS In

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U,
74-83-9	Bromomethane	1	0.20	UUS
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	11	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U



Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-9-080317

Laboratory:

BC Laboratories

SDG:

<u>17-21528</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721528-01

File ID:

07AUG46.D

Sampled:

08/03/17 07:00

08/07/17 09:48

Analyzed:

08/08/17 05:13 25 ml / 25 ml

Solids:

Prepared: Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-9-080317

Laboratory:

BC Laboratories

SDG:

<u>17-21528</u>

Client:

Tidewater Inc.

Project:

JPL-GW Monitoring Wells

Matrix:

Water

Laboratory ID:

110,000

or L- Gw Wilding Wen

Sampled:

Tratel

Lateratory

<u>1721528-01</u>

File ID:

<u>07AUG46.D</u>

bumpiou.

08/03/17 07:00

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 05:13

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

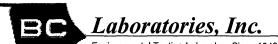
25 ml / 25 ml

Batch:	<u>B[H0652</u>	Sequence:	<u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND)	·	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfi	ide		1	0.48	U
110-57-6	trans-1,4-Dich	nloro-2-butene		1	1.8	U
60-29-7	Diethyl ether			1	0.33	U
97-63-2	Ethyl methacr	ylate		11	1.3	U
637-92-3	Ethyl t-butyl e	ether		1	0.32	U
67-72-1	Hexachloroeth	hane		1	0.11	U
591-78-6	2-Hexanone			1	5.0	U
126-98-7	Methacrylonit	trile		11	2.3	U
78-93-3	Methyl ethyl k	Methyl ethyl ketone		1	3.3	U
74-88-4	Methyl iodide	Methyl iodide		11	1.1	UUJ
108-10-1	Methyl isobut	yl ketone		11	2.4	U
80-62-6	Methyl metha	crylate		1	1.2	U
76-01-7	Pentachloroeth	hane		11	0.63	UUS
107-12-0	Propionitrile			1	6.2	U
109-99-9	Tetrahydrofur	an		1	5.2	U
179601-23-1	p- & m-Xylen	es		1	0.34	U
95-47-6	o-Xylene			1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.310	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7100	97.1	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	10.270	103	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	189670	6.57	194267	6.58	
Chlorobenzene-d5 (IS)	70616	9.61	74707	9.62	
1,4-Difluorobenzene (IS)	275781	7.38	288644	7.38	

^{*} Values outside of QC limits



Environmental Testing Laboratory Since 1949

Tidewater Inc. 3761 Attucks Drive Powell, OH 43065

Reported: 8/31/2017 11:18:16AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

TB-9-080317

Laboratory:

BC Laboratories

SDG:

<u>17-21528</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID: Prepared:

1721528-01

File ID:

07AUG46.D

Sampled:

08/03/17 07:00

08/07/17 09:48

Analyzed:

08/08/17 05:13

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml 3.60 375

Batch:	B[H0652	Sequence:	<u>1713910</u>	Calibration:	<u>1708011</u>	Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND			DILUTION	C	ONC. (ug/L)	Q
107-14-2	Chloroacetonitr	rile		1			U
109-69-3	1-Chlorobutane	>		1			U
513-88-2	1,1-Dichloropro	opanone		1			U
96-33-3	Methyl acrylate)		1			U
98-95-3	Nitrobenzene			1			U
79-46-9	2-Nitropropane			1			U

^{*} Values outside of QC limits



Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-10

Laboratory:

BC Laboratories

SDG:

<u>17-21528</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721528-02

File ID:

07AUG39.D

Sampled:

08/03/17 07:15

08/07/17 09:48

Analyzed:

08/08/17 02:32 25 ml / 25 ml

Solids:

Prepared: Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	TNU
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	. 1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	11	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U



Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524,2

MW-10

Laboratory:

BC Laboratories

SDG:

<u>17-21528</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:
Prepared:

1721528-02

File ID:

<u>07AUG39.D</u>

Sampled:

08/03/17 07:15

08/07/17 09:48

Analyzed:

08/08/17 02:32

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-10

Laboratory:

BC Laboratories

SDG:

17-21528

Client:

Tidewater Inc.

Matrix:

Laboratory ID:

Project:

JPL- GW Monitoring Wells

Water

1721528-02

File ID:

07AUG39.D

Sampled:

08/03/17 07:15

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 02:32 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Seq	uence:	<u>1713910</u>	Calibration:	<u>1708011</u>	Instrument:	MS-V5
CAS NO.	COMPOUND			DILUTION	CC	ONC. (ug/L)	Q
75-15-0	Carbon disulfide			1		0.48	U
110-57-6	trans-1,4-Dichloro-2-bi	ıtene		1		1.8	U
60-29-7	Diethyl ether			11		0.33	U
97-63-2	Ethyl methacrylate			1		1.3	U
637-92-3	Ethyl t-butyl ether			1		0.32	U
67-72-1	Hexachloroethane			1		0.11	U
591-78-6	2-Hexanone		·	1		5.0	U
126-98-7	Methacrylonitrile			1	2.3		U
78-93-3	Methyl ethyl ketone			1	3.3		U
74-88-4	Methyl iodide			11	1.1		UUJ
108-10-1	Methyl isobutyl ketone			1	2.4		U
80-62-6	Methyl methacrylate			1		1.2	U
76-01-7	Pentachloroethane			. 1		0.63	UU
107-12-0	Propionitrile			1	1 6.2		U
109-99-9	Tetrahydrofuran			1		5.2	U
179601-23-1	p- & m-Xylenes			1		0.34	U
95-47-6	o-Xylene			1		0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.310	103	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.8600	98.6	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3900	93.9	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	199350	6.57	194267	6.58	
Chlorobenzene-d5 (IS)	80964	9.62	74707	9.62	
1,4-Difluorobenzene (IS)	296052	7.38	288644	7.38	

^{*} Values outside of QC limits

Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-10

Laboratory:

BC Laboratories

SDG:

17-21528

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721528-02

File ID:

07AUG39.D

Sampled:

08/03/17 07:15

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 02:32 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	B[H0652	Sequence:	<u>1713910</u>	Calibration:	<u>1708011</u>	Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND)		DILUTION	C	ONC. (ug/L)	Q
107-14-2	Chloroaceton	itrile		1			U
109-69-3	1-Chlorobutar	ne		1			U
513-88-2	1,1-Dichlorop	oropanone		1			U
96-33-3	Methyl acryla	ite		1			U
98-95-3	Nitrobenzene			1			U
79-46-9	2-Nitropropar	ne		1			U

^{*} Values outside of QC limits

Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-16

Laboratory:

BC Laboratories

SDG:

17-21528

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721528-03</u>

File ID:

08AUG08.D

Sampled:

08/03/17 08:30

Prepared:

Preparation:

08/08/17 07:00

Analyzed:

08/08/17 14:02

Solids:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0789</u> Sequence: <u>1714016</u>	Calibration:	<u>1708011</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	3.8	
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	U
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	3.1	
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	1.6	
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U



Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-16

Laboratory:

BC Laboratories

SDG:

<u>17-21528</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

Prepared:

1721528-03

File ID:

08AUG08.D

Sampled:

08/03/17 08:30

08/08/17 07:00

Analyzed:

08/08/17 14:02

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0789</u> Sequence: <u>1714016</u>	Calibration:	1708011 Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-16

Laboratory:

BC Laboratories

SDG:

17-21528

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721528-03

File ID:

08AUG08.D

Sampled:

08/03/17 08:30

Prepared:

08/08/17 07:00

Analyzed:

08/08/17 14:02

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0789</u> Sequence: <u>1714016</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulfide	1	0.48	U
110-57-6	trans-1,4-Dichloro-2-butene	1	1.8	U
60-29-7	Diethyl ether	11	0.33	U
97-63-2	Ethyl methacrylate	11	1.3	U
637-92-3	Ethyl t-butyl ether	1	0.32	U
67-72-1	Hexachloroethane	1	0.11	U
591-78-6	2-Hexanone	1	5.0	U
126-98-7	Methacrylonitrile	11	2.3	U
78-93-3	Methyl ethyl ketone	1	3.3	U
74-88-4	Methyl iodide	11	1.1	UU
108-10-1	Methyl isobutyl ketone	11	2.4	U
80-62-6	Methyl methacrylate	1	1.2	U
76-01-7	Pentachloroethane	1	0.63	UUJ
107-12-0	Propionitrile	1	6.2	U
109-99-9	Tetrahydrofuran	1	5.2	U
179601-23-1	p- & m-Xylenes	1	0.34	U
95-47-6	o-Xylene	1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	9.4900	94.9	75 - 125	
Toluene-d8 (Surrogate)	10.000	10.090	101	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.7400	97.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	209541	6.58	209334	6.57	
Chlorobenzene-d5 (IS)	78377	9.62	82669	9.61	
1,4-Difluorobenzene (IS)	301975	7.38	305008	7.38	

^{*} Values outside of QC limits



Reported: 8/31/2017 11:18:16AM

Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-16

Laboratory:

BC Laboratories

SDG:

17-21528

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721528-03</u>

File ID:

08AUG08.D

Sampled:

08/03/17 08:30

Prepared:

08/08/17 07:00

Analyzed:

08/08/17 14:02

Solids:

Preparation:

EPA 5030 Water MS

25 ml / 25 ml

Initial/Final:

Batch:	B[H0789	Sequence:	<u>1714016</u>	Calibration:	<u>1708011</u>	Instrument:	MS-V5
CAS NO.	COMPOUND)		DILUTION	C	ONC. (ug/L)	Q
107-14-2	Chloroacetoni	itrile		1			U
109-69-3	1-Chlorobutar	ne	-	1			U
513-88-2	1,1-Dichlorop	propanone		1			U
96-33-3	Methyl acryla	ite		1			U
98-95-3	Nitrobenzene			1			U
79-46-9	2-Nitropropan	ne		1			U

^{*} Values outside of QC limits

Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-7

Laboratory:

BC Laboratories

SDG:

<u>17-21528</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721528-04

File ID:

07AUG48.D

Sampled:

08/03/17 09:35

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 05:59

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	1	0.27	U
75-27-4	Bromodichloromethane	1	0.20	J
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	UW
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	11	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	2.4	
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	11	0.89	U
106-93-4	1,2-Dibromoethane	1	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	Ŭ
75-34-3	1,1-Dichloroethane	1	0.15	U
107-06-2	1,2-Dichloroethane	1	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U



Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-7

Laboratory:

BC Laboratories

SDG:

<u>17-21528</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

1721528-04

File ID:

<u>07AUG48.D</u>

Sampled:

Laboratory ID:

08/07/17 09:48

Analyzed:

08/08/17 05:59

Solids:

08/03/17 09:35

Preparation:

Prepared:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	. 1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U

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Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-7

Laboratory:

BC Laboratories

SDG:

17-21528

Client:

Tidewater Inc.

08/03/17 09:35

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

File ID:

07AUG48.D

Sampled:

1721528-04 08/07/17 09:48

Analyzed:

08/08/17 05:59

Solids:

Initial/Final:

25 ml / 25 ml

Prepared: Preparation:

EPA 5030 Water MS

Instrument MS-V5

Batch:	<u>B[H0652</u>	Sequence:	<u>1713910</u>	Calibration:	<u>1708011</u>	Instrument:	MS-V5	
CAS NO.	COMPOUND			DILUTION	CON	CONC. (ug/L)		
75-15-0	Carbon disulfide	e		1		0.48	U	
110-57-6	trans-1,4-Dichlo	oro-2-butene		1		1.8	U	
60-29-7	Diethyl ether			1		0.33	U	
97-63-2	Ethyl methacryl	ate		1		1.3	U	
637-92-3	Ethyl t-butyl eth	ier		1		0.32	U	
67-72-1	Hexachloroethan	ne		1		0.11	U	
591-78-6	2-Hexanone			1		5.0		
126-98-7	Methacrylonitril	le		11		2.3		
78-93-3	Methyl ethyl ket	tone		1		3.3		
74-88-4	Methyl iodide			11		1.1		
108-10-1	Methyl isobutyl	ketone		1		2.4		
80-62-6	Methyl methacr	ylate		1		1.2		
76-01-7	Pentachloroetha	ne		1		0.63	th u	
107-12-0	Propionitrile			11		U		
109-99-9	Tetrahydrofuran			1	5.2		U	
179601-23-1	p- & m-Xylenes			11		U		
95-47-6	o-Xylene			1		0.13	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	10.040	100	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.3800	93.8	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	175844	6.57	194267	6.58	
Chlorobenzene-d5 (IS)	71112	9.61	74707	9.62	
1,4-Difluorobenzene (IS)	255796	7.38	288644	7.38	

^{*} Values outside of QC limits

Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

MW-7

Laboratory:

BC Laboratories

SDG:

17-21528

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721528-04

File ID:

07AUG48.D

Sampled:

08/03/17 09:35

Prepared:

Preparation:

08/07/17 09:48

Analyzed:

08/08/17 05:59

Solids:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

MS-V5

Batch:	B[H0652	Sequence:	<u>1713910</u>	Calibration:	<u>1708011</u>	Instrument:
CAS NO.	COMPOUND			DILUTION	CC	NC. (ug/L)

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
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		Ū

^{*} Values outside of QC limits



Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-9-080317

Laboratory:

BC Laboratories

SDG:

<u>17-21528</u>

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

<u>1721528-05</u>

File ID:

07AUG49.D

Sampled:

08/03/17 09:45

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 06:22 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	MS-V5
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
71-43-2	Benzene	1	0.11	U
108-86-1	Bromobenzene	1	0.15	U
74-97-5	Bromochloromethane	11	0.27	U
75-27-4	Bromodichloromethane	1	0.20	U
75-25-2	Bromoform	1	0.46	U
74-83-9	Bromomethane	1	0.20	בט ט
104-51-8	n-Butylbenzene	1	0.15	U
135-98-8	sec-Butylbenzene	1	0.13	U
98-06-6	tert-Butylbenzene	1	0.18	U
56-23-5	Carbon tetrachloride	1	0.17	U
108-90-7	Chlorobenzene	1	0.14	U
75-00-3	Chloroethane	1	0.17	U
67-66-3	Chloroform	1	0.14	U
74-87-3	Chloromethane	1	0.11	U
95-49-8	2-Chlorotoluene	1	0.14	U
106-43-4	4-Chlorotoluene	1	0.093	U
124-48-1	Dibromochloromethane	1	0.22	U
96-12-8	1,2-Dibromo-3-chloropropane	1	0.89	U
106-93-4	1,2-Dibromoethane	11	0.22	U
74-95-3	Dibromomethane	1	0.23	U
95-50-1	1,2-Dichlorobenzene	1	0.21	U
541-73-1	1,3-Dichlorobenzene	1	0.16	U
106-46-7	1,4-Dichlorobenzene	1	0.15	U
75-71-8	Dichlorodifluoromethane	1	0.15	U
75-34-3	1,1-Dichloroethane	11	0.15	U
107-06-2	1,2-Dichloroethane	11	0.17	U
75-35-4	1,1-Dichloroethene	1	0.27	U
156-59-2	cis-1,2-Dichloroethene	1	0.27	U
156-60-5	trans-1,2-Dichloroethene	1	0.17	U
78-87-5	1,2-Dichloropropane	1	0.15	U
142-28-9	1,3-Dichloropropane	1	0.13	U
594-20-7	2,2-Dichloropropane	1	0.18	U



Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17
Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-9-080317

Laboratory:

BC Laboratories

SDG:

17-21528

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721528-05

File ID:

07AUG49.D

Sampled:

08/03/17 09:45

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 06:22 25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

Batch:	<u>B[H0652</u> Sequence: <u>1713910</u>	Calibration:	1708011 Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q
563-58-6	1,1-Dichloropropene	1	0.19	U
10061-01-5	cis-1,3-Dichloropropene	1	0.14	U
10061-02-6	trans-1,3-Dichloropropene	1	0.13	U
100-41-4	Ethylbenzene	1	0.15	U
87-68-3	Hexachlorobutadiene	1	0.20	U
98-82-8	Isopropylbenzene	1	0.14	U
99-87-6	p-Isopropyltoluene	1	0.14	U
75-09-2	Methylene chloride	1	0.21	U
1634-04-4	Methyl t-butyl ether	1	0.14	U
91-20-3	Naphthalene	1	0.16	U
103-65-1	n-Propylbenzene	1	0.12	U
100-42-5	Styrene	1	0.12	U
630-20-6	1,1,1,2-Tetrachloroethane	1	0.21	U
79-34-5	1,1,2,2-Tetrachloroethane	1	0.17	U
127-18-4	Tetrachloroethene	1	0.23	U
108-88-3	Toluene	1	0.17	U
87-61-6	1,2,3-Trichlorobenzene	1	0.19	U
120-82-1	1,2,4-Trichlorobenzene	1	0.15	U
71-55-6	1,1,1-Trichloroethane	1	0.21	U
79-00-5	1,1,2-Trichloroethane	1	0.21	U
79-01-6	Trichloroethene	1	0.19	U
75-69-4	Trichlorofluoromethane	1	0.14	U
96-18-4	1,2,3-Trichloropropane	1	0.78	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.19	U
95-63-6	1,2,4-Trimethylbenzene	1	0.17	U
108-67-8	1,3,5-Trimethylbenzene	1	0.14	U
75-01-4	Vinyl chloride	1	0.18	U
67-64-1	Acetone	1	6.6	U
107-13-1	Acrylonitrile	1	1.5	U
107-05-1	Allyl chloride	1	0.47	U
994-05-8	t-Amyl Methyl ether	1	0.19	U
75-65-0	t-Butyl alcohol	1	9.4	U



Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17 Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-9-080317

Laboratory:

BC Laboratories

SDG:

17-21528

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Laboratory ID:

File ID:

07AUG49.D

Sampled:

Water

1721528-05

08/08/17 06:22

08/03/17 09:45

Prepared:

08/07/17 09:48

Analyzed:

25 ml / 25 ml

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final: 1700011

Batch:	B[H0652	Sequence:	<u>1713910</u>	Calibration:	<u>1708011</u> Instrument:	<u>MS-V5</u>
CAS NO.	COMPOUND)		DILUTION	CONC. (ug/L)	Q
75-15-0	Carbon disulf	ide		1	0.48	U
110-57-6	trans-1,4-Dich	nloro-2-butene		1	1.8	U
60-29-7	Diethyl ether			1	0.33	U
97-63-2	Ethyl methacr	ylate		1	1.3	U
637-92-3	Ethyl t-butyl e	ether		1	0.32	U
67-72-1	Hexachloroeth	nane		1	0.11	U
591-78-6	2-Hexanone			1	5.0	U
126-98-7	Methacrylonit	rile		1	2.3	U
78-93-3	Methyl ethyl l	ketone		1	3.3	U
74-88-4	Methyl iodide			1	1.1	ZN n
108-10-1	Methyl isobut	yl ketone		1	2.4	U
80-62-6	Methyl metha	crylate		1	1.2	U
76-01-7	Pentachloroet	hane		1	0.63	עט ט עס
107-12-0	Propionitrile			1	6.2	U
109-99-9	Tetrahydrofuran			1	5.2	Ŭ
179601-23-1	p- & m-Xylen	ies		1	0.34	U
95-47-6	o-Xylene			1	0.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4 (Surrogate)	10.000	10.810	108	75 - 125	
Toluene-d8 (Surrogate)	10.000	9.7700	97.7	80 - 120	
4-Bromofluorobenzene (Surrogate)	10.000	9.9400	99.4	80 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene (IS)	177588	6.58	194267	6.58	
Chlorobenzene-d5 (IS)	71073	9.61	74707	9.62	
1,4-Difluorobenzene (IS)	269335	7.38	288644	7.38	

^{*} Values outside of QC limits

Reported: 8/31/2017 11:18:16AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

ORGANIC ANALYSIS DATA SHEET EPA-524.2

EB-9-080317

Laboratory:

BC Laboratories

SDG:

17-21528

Client:

Tidewater Inc.

Project:

JPL- GW Monitoring Wells

Matrix:

Water

Laboratory ID:

1721528-05

File ID:

07AUG49.D

Sampled:

08/03/17 09:45

Prepared:

08/07/17 09:48

Analyzed:

08/08/17 06:22

Solids:

Preparation:

EPA 5030 Water MS

Initial/Final:

25 ml / 25 ml

BIH0652 Sequence:

1708011

MS-V5 Instrument:

Batch:	B[H0652	Sequence:	<u>1713910</u>	Calibration:	<u>1708011</u>	Instrument:	MS-V5
CAS NO.	COMPOUND			DILUTION	CC	ONC. (ug/L)	Q
107-14-2	Chloroacetonitrile			1			Ū
109-69-3	1-Chlorobutane			1			U
513-88-2	1,1-Dichlorop	ropanone		1			U
96-33-3	Methyl acrylate			1			U
98-95-3	Nitrobenzene			1			U
79-46-9	2-Nitropropane			1			U

^{*} Values outside of QC limits

LDC #:_	39394B1	VALIDATION COMPLETENESS WORKSHEET	
SDG #:	17-21528	Level III	
Laborat	ory: <u>BC Labo</u>	oratories, Inc.	2n/

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	
11.	GC/MS Instrument performance check	1-4	
III.	Initial calibration/ICV	AA	250 ≈ 20%. Y2 /CV ≈ 30% CCV ≈ 30%
IV.	Continuing calibration	M	ec/ = 30%
V.	Laboratory Blanks	\	
VI.	Field blanks	NO	73=/. ZB=5
VII.	Surrogate spikes	1	
VIII.	Matrix spike/Matrix spike duplicates	I A	
IX.	Laboratory control samples	A	105
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-9-080317	1721528-01	Water	08/03/17
2	MW-10	1721528-02	Water	08/03/17
3 > -	MW-16	1721528-03	Water	08/03/17
4	MW-7	1721528-04	Water	08/03/17
5	EB-9-080317	1721528-05	Water	08/03/17
6	MW-10MS	1721528-02MS	Water	08/03/17
7	MW-10MSD	1721528-02MSD	Water	08/03/17
8 7	MW-16MS	1721528-03MS	Water	08/03/17
97	MW-16MSD	1721528-03MSD	Water	08/03/17
10				
11				
12				
13				

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-lsopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. lodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methylcyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.



VALIDATION FINDINGS WORKSHEET <u>Continuing Calibration</u>

Page:__/of_/ Reviewer:_____ 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".

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%?

	<u>N/A</u> vvere all pe	ercent diπerences (%D) ≤ 30			1	
#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	8/8/17	07AU433	B.	32.6	1-2.4-7.MB	VMP
	, ,	/	Methyliodide	52./ 36.2	(NO)	
	,		2222	36.7		2
	8/8/17	08AU403	Methy Todide	34.1 41.0	3,8-9.MB (ND)	VMA
	, ,	,	2222	41.0	(ND)	
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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 20, 2017

Parameters:

Chromium

Validation Level:

Level III

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-21528

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MVV-10	1721528-02	Water	08/03/17
MVV-16	1721528-03	Water	08/03/17
MVV-7	1721528-04	Water	08/03/17
EB-9-080317	1721528-05	Water	08/03/17
MW-10MS	1721528-02MS	Water	08/03/17
MW-10MSD	1721528-02MSD	Water	08/03/17
MW-10DUP	1721528-02DUP	Water	08/03/17

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Chromium by Environmental Protection Agency (EPA) Method 200.8

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

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

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

IV. ICP Interference Check Sample Analysis

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

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Chromium	1.6670 ug/L	MW-7

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

Sample EB-9-080317 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration
EB-9-080317	Chromium	0.78 ug/L

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

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

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

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

XI. Field Duplicates

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, 3Q2017 Chromium - Data Qualification Summary - SDG 17-21528

No Sample Data Qualified in this SDG

NASA JPL, 3Q2017 Chromium - Laboratory Blank Data Qualification Summary - SDG 17-21528

No Sample Data Qualified in this SDG

Reported: 8/31/2017 11:22:46AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-200.8**

MW-10

Laboratory: BC Laboratories

SDG: 17-21528

Client: Tidewater Inc.

08/03/17 07:15

Project: JPL-GW Monitoring Wells

Laboratory ID: <u>1721528-02</u>

Prepared: 08/07/17 09:30

File ID: PE EL2 170807-248

Analyzed: 08/07/17 23:59

Sampled:

Matrix: Water

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0588</u> Sequence: 1713993

Calibration: UNASSIGNED

Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	3.8	1		EPA-200.8

Reported: 8/31/2017 11:22:46AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET

EPA-200.8

MW-16

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-03</u>

File ID: PE EL2 170807-259

Sampled: 08/03/17 08:30

Prepared: 08/07/17 09:30

Analyzed: 08/08/17 00:38

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Instrument: PE-EL2

Batch: <u>B[H0588</u>

Sequence: <u>1713993</u>

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
7440-47-3	Total Recoverable Chromium	76	1		EPA-200.8

Reported: 8/31/2017 11:22:46AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-200.8

MW-7

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-04</u>

File ID: PE EL2 170808-225

Sampled: 08/03/17 09:35

Prepared: 08/07/17 09:30

Analyzed: 08/09/17 05:40

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0588</u>

Sequence: <u>1714090</u>

Calibration: UNASSIGNED

Instrument: PE-EL2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method	
7440-47-3	Total Recoverable Chromium	7400	10	D	EPA-200.8	

Reported: 8/31/2017 11:22:46AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-200.8**

EB-9-080317

Laboratory: BC Laboratories

SDG: 17-21528

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-05</u>

File ID: PE EL2 170807-261

Sampled: <u>08/03/17 09:45</u>

Prepared: 08/07/17 09:30

Analyzed: 08/08/17 00:44

Solids: <u>0.00</u>

Preparation: EPA 200.2

Initial/Final: 50 ml / 50 ml

Batch: <u>B[H0588</u>

Sequence:

1713993

Calibration: <u>UNASSIGNED</u>

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

LDC #:	39394B4a	VALIDATION COMPLETENESS WORKSHEET
SDG #:_	17-21528	Level III

	Date:	09	18	11-
	Page:_	$L_{\sf of}$		
	Reviewer:	AI		
2nd	Reviewer:	13		

Laboratory: BC Laboratories, Inc.

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	AA	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	4=EB
VII.	Matrix Spike/Matrix Spike Duplicates	A	
VIII.	Duplicate sample analysis	A	
IX.	Serial Dilution	N	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	_ N	
XIII.	Sample Result Verification	N	
XIV	Overall Assessment of Data	<u> A.</u>	

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-10	1721528-02	Water	08/03/17
2	MW-16	1721528-03	Water	08/03/17
3	MW-7	1721528-04	Water	08/03/17
4	EB-9-080317	1721528-05	Water	08/03/17
5	MW-10MS	1721528-02MS	Water	08/03/17
6	MW-10MSD	1721528-02MSD	Water	08/03/17
7	MW-10DUP	1721528-02DUP	Water	08/03/17
8				
9				
10				
11				
12				
13				
14_				

Notes:

LDC #: 39394B4a

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: NA
Associated Samples: 3

Page: 1 of 1
Reviewer: ATL
2nd Reviewer:

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: <u>ug/L</u>

				10 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C	Service Property of the Control of t			
Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)						
Cr		1.6670	8.335					

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.

ī	DC	#.	39394B4a	
L	JU.	#.	39394D4a	

VALIDATION FINDINGS WORKSHEET <u>Field Blanks</u>

Page: <u>1</u> of_	1	_
Reviewer: ATL		
2nd Reviewer: الكافر		

METHOD: Trace Metals (EPA SW846 6010B/7000)

Blank units: ug/L Associated sample units: ug/L

Sampling date: 08/03/17 Soil factor applied ______

Field blank type: (circle one) Field Blank / Rinsate / Other: FB

Fleiu blank u	ype. (circle c	rie) Field Blank / Kinsale / Other. LD	Associated Samples. A report	
Analyte	Blank ID		Sample Identification	
		Action Limit		
Cr	0.78	290		

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL, 3Q2017

LDC Report Date:

September 20, 2017

Parameters:

Wet Chemistry

Validation Level:

Level III

Laboratory:

BC Laboratories, Inc.

Sample Delivery Group (SDG): 17-21528

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MVV-10	1721528-02	Water	08/03/17
MW-16	1721528-03	Water	08/03/17
MW-7	1721528-04	Water	08/03/17
EB-9-080317	1721528-05	Water	08/03/17
MW-10MS	1721528-02MS	Water	08/03/17
MW-10MSD	1721528-02MSD	Water	08/03/17
MW-10DUP	1721528-02DUP	Water	08/03/17
MW-16MS	1721528-03MS	Water	08/03/17
MW-16MSD	1721528-03MSD	Water	08/03/17
MW-16DUP	1721528-03DUP	Water	08/03/17

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, Sulfate Environmental Protection Agency (EPA) Method 300.0

Nitrite as Nitrogen EPA Method 353.2 Hexavalent Chromium by EPA SW 846 Method 7196 Orthophosphate-Phosphorus by EPA Method 365.1 Perchlorate by EPA Method 314.0

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

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

III. Continuing Calibration

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

IV. Laboratory Blanks

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

V. Field Blanks

Sample EB-9-080317 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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Level III validation.

XI. Overall Assessment of Data

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

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

NASA JPL, 3Q2017 Wet Chemistry - Data Qualification Summary - SDG 17-21528

No Sample Data Qualified in this SDG

NASA JPL, 3Q2017 Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 17-21528

No Sample Data Qualified in this SDG

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-300.0

MW-16

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-03</u>

File ID: <u>E080417.seq-20</u>

Sampled: 08/03/17 08:30

Prepared: 08/04/17 17:00

Analyzed: 08/04/17 18:29

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0502</u>

Sequence: <u>1714411</u>

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	86	1		EPA-300.0
14797-55-8	Nitrate as N	1.4	1		EPA-300.0
14808-79-8	Sulfate	54	1		EPA-300.0

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-300.0**

MW-7

Laboratory: BC Laboratories

SDG: 17-21528

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-04</u>

File ID: E080417.seq-21

08/03/17 09:35 Sampled:

Prepared: <u>08/04/17 17:00</u>

Analyzed: 08/04/17 18:47

0.00 Solids:

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0502</u>

Sequence:

1714411

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
16887-00-6	Chloride	86	1		EPA-300.0
14797-55-8	Nitrate as N	1.5	1		EPA-300.0
14808-79-8	Sulfate	. 55	1		EPA-300.0

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-10

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-02</u>

File ID: F081417.seq-49.0000.txt

Sampled: <u>08/03/17 07:15</u>

Prepared: 08/15/17 01:00

Analyzed: 08/15/17 08:45

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H1387

Sequence: <u>1714797</u>

Calibration: <u>UNASSIGNED</u>

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

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-16

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-03</u>

File ID: F081417.seq-97.0000.txt

Sampled: 08/03/17 08:30

Prepared: 08/15/17 01:00

Analyzed: 08/15/17 21:54

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H1591</u>

Sequence: <u>1714797</u>

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

MW-7

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client:

Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: 1721528-04RE2

File ID: F081417.seq-105.0000.txt

Sampled: 08/03/17 09:35

Prepared: <u>08/15/17 01:00</u>

Analyzed: 08/15/17 23:49

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H1387</u>

Sequence:

1714797

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	12	1		EPA-314.0

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-314.0

EB-9-080317

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client: Tidewater Inc. Project: JPL-GW Monitoring Wells

Water Matrix:

Laboratory ID: <u>1721528-05</u>

File ID: F081417.seq-62.0000.txt

08/03/17 09:45 Sampled:

Prepared: <u>08/15/17 01:00</u>

Analyzed: 08/15/17 11:45

Solids: 0.00

Batch: <u>B[H1387</u>

Preparation: No Prep

1714797

Sequence:

Initial/Final: 20 ml / 20 ml Calibration: UNASSIGNED

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	Q	Method
14797-73-0	Perchlorate	0.58	1	U	EPA-314.0

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-353.2

MW-16

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-03</u>

File ID: 170804 0816 NO2-025

Sampled: 08/03/17 08:30

Prepared: <u>08/04/17 08:16</u>

Analyzed: 08/04/17 08:39

Solids: <u>0.00</u>

Preparation: No Prep

rep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0564</u>

Sequence: <u>1713981</u>

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.010	1	U	EPA-353.2

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-353.2

MW-7

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: 1721528-04

File ID: 170804 0816 NO2-029

Sampled: <u>08/03/17 09:35</u>

Prepared: 08/04/17 08:16

Analyzed: 08/04/17 08:39

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0564</u>

Sequence: <u>1713981</u>

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
14797-65-0	Nitrite as N	0.010	1	U	EPA-353.2

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-365.1

MW-16

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client:

Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-03</u>

File ID: 170804 0909 PO4-045

Sampled: <u>08/03/17 08:30</u>

Prepared: 08/04/17 09:09

Analyzed: <u>08/04/17 09:09</u>

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0566</u>

Sequence:

1713984

Calibration: <u>UNASSIGNED</u> Instrument: KONE-1

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
	ortho-Phosphate as P	0.30	1		EPA-365.1

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-365.1

MW-7

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: 1721528-04

File ID: 170804 0909 PO4-049

Sampled: <u>08/03/17 09:35</u>

Prepared: <u>08/04/17 09:09</u>

Analyzed: <u>08/04/17 09:09</u>

Initial/Final: 20 ml / 20 ml

Solids: <u>0.00</u>

Batch: <u>B[H0566</u>

Preparation: No Prep

1713984

Sequence:

Calibration: <u>UNASSIGNED</u>

Instrument: KONE-1

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

TIMPOR

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-10

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client: <u>Tidewater Inc.</u>

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-02</u>

File ID: 170803 2110 CR6-005

Sampled: <u>08/03/17 07:15</u>

Prepared: 08/03/17 21:10

Analyzed: 08/03/17 21:10

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0395

Sequence: <u>1713941</u>

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method
18540-29-9	Hexavalent Chromium	0.0029	1		EPA-7196

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-16

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-03</u>

File ID: 170803 2110 CR6-011

Sampled: 08/03/17 08:30

Prepared: 08/03/17 21:10

Analyzed: 08/03/17 21:10

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: <u>B[H0396</u>

Sequence:

1713941

Calibration: <u>UNASSIGNED</u>

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	Q	Method	
18540-29-9	Hexavalent Chromium	0.0016	1	J	EPA-7196	

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET EPA-7196

MW-7

Laboratory: BC Laboratories

SDG: <u>17-21528</u>

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-04</u>

File ID: 170803 2110 CR6-023

Sampled: <u>08/03/17 09:35</u>

Prepared: 08/03/17 21:10

Analyzed: 08/03/17 21:31

Solids: <u>0.00</u>

Batch: B[H0396

Preparation: No Prep

1713941

Sequence:

Initial/Final: 20 ml / 20 ml
Calibration: UNASSIGNED Instrumen

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

Reported: 8/31/2017 11:20:22AM Project: JPL- GW Monitoring Wells

Project Number: 3Q17

Project Manager: David Conner

INORGANIC ANALYSIS DATA SHEET **EPA-7196**

EB-9-080317

Laboratory: BC Laboratories

SDG: 17-21528

Client: Tidewater Inc.

Project: JPL-GW Monitoring Wells

Matrix: Water

Laboratory ID: <u>1721528-05</u>

File ID: 170803 2110 CR6-018

Sampled: 08/03/17 09:45

Prepared: 08/03/17 21:10

Analyzed: 08/03/17 21:14

Solids: <u>0.00</u>

Preparation: No Prep

Initial/Final: 20 ml / 20 ml

Batch: B[H0396

Sequence:

1713941

Calibration: UNASSIGNED

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

LDC #: 39394B6 VALIDATION COMPLETENESS WORKSHEET SDG #: 17-21528 Level III Laboratory: BC Laboratories, Inc.

Date: <u>09/18</u> /17	7
Page: <u></u> of <u></u> _	
Reviewer:_ <i>ATV_</i>	
2nd Reviewer:_ <u>\$</u>	

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA Method 300.0), Nitrite-N (EPA Method 353.2), Hexavalent Chromium (EPA SW846 Method 7196), Orthophosphate-P (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
1.	Sample receipt/Technical holding times	AIA	
- 11	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	ND	4=EB
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Sample result verification	N ·	
x	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	MVV-10	1721528-02	Water	08/03/17
2	MVV-16	1721528-03	Water	08/03/17
3	MVV-7	1721528-04	Water	08/03/17
4	EB-9-080317	1721528-05	Water	08/03/17
5	MW-10MS	1721528-02MS	Water	08/03/17
6	MW-10MSD	1721528-02MSD	Water	08/03/17
7	MW-10DUP	1721528-02DUP	Water	. 08/03/17
8	MW-16MS	1721528-03MS	Water	08/03/17
9	MW-16MSD	1721528-03MSD	Water	08/03/17
10	MW-16DUP	1721528-03DUP	Water	08/03/17
11				
12				
13				
14				
15				

Notes:				
· · · · · · · · · · · · · · · · · · ·				

LDC #: 39394BG

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: ATU
2nd reviewer: JB

All circled methods are applicable to each sample.

Sample ID	
2,3	pH TDS(CI)F (NO) (SO) (O-PO) AIK CN NH3 TKN TOC Cr6+ CIO4
1-74	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+(CIO4)
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ AIK CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
QC_	pH TDS CI F NO ₂ NO ₂ SO ₄ O-PO ₄ AIK CN NH ₃ TKN TOC Cr6+ CIO ₄
8,9,10	ph tds(ci)f (0) (0) (50) (0-PO) Aik CN NH3 TKN TOO (Cr6) (CIO)
5,6,7	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC (Cr6+) CIO)
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH_TDS_CI_F_NO3_NO2_SO4_O-PO4_AIk CN_NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
:	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ AIK CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ AIK CN NH ₃ TKN TOC Cr6+ CIO ₄
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH_TDS_CLE_NO_NO_SO_O-PO_AIK_CN_NH_TKN_TOC_Cr6+ ClO_

mments:	 			 	 		