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February 26, 2018

Ms. Carolyn Bury - LU-16J U.S. EPA Region 5 Corrective Action Section 77 West Jackson Boulevard Chicago, IL 60604-3507

> Re: Long-Term Monitoring Program 4<sup>th</sup> Quarter 2017 Data Report Solutia Inc., W. G. Krummrich Plant, Sauget, IL

Dear Ms. Bury:

Enclosed please find the Long-Term Monitoring Program 4<sup>th</sup> Quarter 2017 Data Report for Solutia Inc.'s W. G. Krummrich Plant, Sauget, IL. Results from sampling of supplemental piezometers GWE-1D, 2D, and 3D and supplemental wells GWE-5D, ESL-MW-A and D1, and PM1D are also included in this report.

Per EPA's February 9, 2016, response to Solutia's December 23, 2015, submittal:

- sampling of supplemental piezometers GWE-5S and 5M and supplemental wells ESL-MW-C1 and PM1M has been discontinued; and
- the sampling frequency for supplemental piezometer GWE-1D and supplemental well ESL-MW-A has been reduced to the first and third quarters.

On May 2, 2017, Solutia submitted a "Periodic Technical Review" recommending changes to this groundwater monitoring program, along with similar Reviews for the other programs. Solutia would like to receive - and resolve - US EPA's comments as soon as possible before June 1, the latest date to begin implementation of  $2^{nd}$  quarter 2018 monitoring, but which we would not otherwise perform per our recommendations.

If you have any questions or comments regarding this report, please contact me at (314) 674-3312 or gmrina@eastman.com

Sincerely,

4 Mr Athi

Gerald M. Rinaldi Manager, Remediation Services

Enclosure

cc: Distribution List

## **DISTRIBUTION LIST**

Long-Term Monitoring Program 4<sup>th</sup> Quarter 2017 Data Report Solutia Inc., W. G. Krummrich Plant, Sauget, IL

#### **USEPA**

Stephanie Linebaugh USEPA Region 5 - SR6J, 77 West Jackson Boulevard, Chicago, IL 60604

<u>Solutia</u>

Donn Haines	500 Monsanto Avenue, Sauget, IL 62206-1198
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GSI Environmental (CD only)

Chuck Newell 2211 Norfolk Street, Suite 1000, Houston, TX 77098-4044



# GROUNDWATER MONITORING REPORT

4<sup>th</sup> QUARTER 2017 DATA REPORT LONG-TERM MONITORING PROGRAM SOLUTIA INC., W.G. KRUMMRICH FACILITY SAUGET, ILLINOIS

Prepared For: Solutia Inc. 575 Maryville Centre Drive St. Louis, MO 63141 USA

Submitted By: Golder Associates Inc. 820 S. Main Street, Suite 100 St. Charles, MO 63301 USA

February 2018

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- Appendix D Groundwater Analytical Results (including data validation reports)
- Appendix E Microbial Insights Data Package



# 1.0 INTRODUCTION

Golder Associates Inc. (Golder) is pleased to submit this report summarizing the 4<sup>th</sup> Quarter 2017 (4Q17) Long-Term Monitoring Program (LTMP) groundwater sampling activities at the Solutia Inc. (Solutia) W.G. Krummrich (WGK) plant (Site) in Sauget, Illinois. The facility is located at 500 Monsanto Avenue, Sauget, Illinois as shown on Figure 1.

The 4Q17 sampling event was performed in general accordance with the Revised LTMP Work Plan (Work Plan) (Solutia 2009). Work conducted during the LTMP is designed to evaluate the effectiveness of monitored natural attenuation (MNA). The effectiveness of MNA at the Site, is shown by the following:

- A clear and meaningful trend of decreasing contaminant mass
- Data that indirectly demonstrate the types and rates of natural attenuation process active at the Site
- Data that directly demonstrate the occurrence of biodegradation processes at the Site

The Work Plan addresses quarterly sampling requirements from the United States Environmental Protection Agency's (USEPA) February 26, 2008, Final Decision (USEPA, 2008). According to the Work Plan, ten (10) groundwater samples are to be collected from monitoring wells from two (2) source areas, former Benzene Storage Area and former Chlorobenzene Process Area; four (4) monitoring wells located downgradient of the former Benzene Storage Area. Monitoring wells are located in the Shallow Hydrogeologic Unit (SHU), Middle Hydrogeologic Unit (MHU) and Deep Hydrogeologic Unit (DHU). One (1) monitoring well is screened in the SHU at the former Benzene Storage Area. The remaining nine (9) wells are screened in the MHU and DHU. Analytical data from these wells are used to evaluate the attenuation processes in the America Bottoms aquifer, as impacted groundwater from these source areas migrates toward and discharges to the Mississippi River.

In addition to the monitoring wells specified in the Work Plan, the USEPA has also requested that groundwater samples be collected from additional monitoring wells and piezometers (supplemental wells) approximately 1.0 to 1.5 miles north of the Site. In response to Solutia's December 23, 2015, request, on February 9, 2016, the USEPA reduced the number of supplemental wells from eleven (11) to seven (7) for the first and third quarter sampling events and to five (5) for the second and fourth quarter sampling events.

The scope of work detailed in the Work Plan is summarized below.

Fifteen (15) monitoring wells and piezometers are sampled during the 4Q17 LTMP event. The locations of the monitoring wells, piezometers and source areas are shown on Figure 2 and the sample locations are included on the following table.





Area	Location Relative to Area	Sample Identification
	Source Area Well	BSA-MW-1S
		BSA-MW-2D
Former Benzene Storage	Downaradiant	BSA-MW-3D
	Downgradient	BSA-MW-4D
		BSA-MW-5D
	Source Area Well	CPA-MW-1D
		CPA-MW-2D
Former Chlorobenzene Process	Downgradiant	CPA-MW-3D
	Downgradient	CPA-MW-4D
		CPA-MW-5D
		ESL-MW-D1
		GWE-2D
Supplemental Wells North of the Site		GWE-3D
		GWE-5D
		PM1D

Water levels in the monitoring wells and piezometers are measured quarterly and total depths are measured in the 1<sup>st</sup> quarter of each year.

During the quarterly sampling events, monitoring wells and piezometers are sampled for the following volatile organic compound (VOC) analytes: benzene; chlorobenzene; 1,2-dichlorobenzene; 1,3-dichlorobenzene; and 1,4-dichlorobenzene. During the 1<sup>st</sup> and 3<sup>rd</sup> quarters, monitoring wells and piezometers are sampled for the following semi-volatile organic compound (SVOC) analytes: 4-chloroaniline (CPA-MW-3D, CPA-MW-4D and CPA-MW-5D); 2-chlorophenol (BSA and CPA wells); 1,2,4-trichlorobenzene (BSA and CPA wells); and 1,4-dioxane (BSA-MW-2D, BSA-MW-3D, BSA-MW-4D, and BSA-MW-5D). The following MNA parameters are sampled quarterly to evaluate active natural attenuation occurring at the Site:

- Electron Donors total and dissolved organic carbon
- Electron Acceptors iron, manganese, nitrate, sulfate
- Biodegradation Byproducts carbon dioxide, chloride, methane
- Biodegradation Indicators alkalinity

Microbial Insights BioTrap® samplers for Phospholipid Fatty Acid (PLFA) analysis and Stable Isotope Probes (SIPs) baited with benzene or chlorobenzene are deployed quarterly to demonstrate the occurrence of biodegradation occurring at the Site.





## 2.0 FIELD ACTIVITIES

Golder conducted 4Q17 sampling events between December 4 and December 7, 2017. Activities were performed in general accordance with the Work Plan.

## 2.1 Water Level Measurement

Prior to sampling during the 4Q17 event, Golder performed a synoptic round of water level measurements at 76 monitoring wells and piezometers on November 30 and December 1, 2017. The following monitoring well and piezometer series are included in the LTMP:

- BSA-series
- CPA-series
- ESL-series
- GM-series
- GWE-series
- K-series
- PS-MW-series
- PMA-series
- PM-series
- Piezometer clusters installed for Sauget Area 2 RI/FS and WGK CA-750 Environmental Indicator projects

An oil/water interface probe was used to measure the water level (to 0.01 feet) and, if present, detect and measure the thickness of non-aqueous phase liquid (NAPL). During the 4Q17 sampling event, NAPL was not detected in any of the monitoring wells or piezometers. Total depths are measured during the 1<sup>st</sup> quarter of each year. The 4Q17 well gauging information is shown on Table 1. The information collected from the MHU and the DHU was used to create a groundwater potentiometric surface map, as shown on Figure 3.

## 2.2 Groundwater Sample Collection

Monitoring wells and piezometers sampled during the 4Q17 LTMP event were purged and sampled using low-flow sampling techniques, low-density polyethylene tubing (LDPE) and a submersible or peristaltic pump (GWE-2D and GWE-3D). The pump intake was placed at approximately the middle of the screened interval for each well. Purging was conducted at a rate of approximately 300 mL/min to reduce drawdown. Drawdown was measured throughout purging activities to ensure that it did not exceed 25% of the distance between the pump intake and the top of the screen. Measurement of field parameters began once the flow rate and drawdown were stable. Parameters were measured for each system volume purged using a SmartTROLL<sup>™</sup> multi-parameter meter. The system volume includes the volume of the tubing, the volume of the pump and the volume of flow-through cell containing the multi-parameter meter. Samples were





collected after field parameters were stabilized within the ranges below for three (3) consecutive measurements:

- Dissolved Oxygen (DO): +/- 10% or +/- 0.2 mg/L, whichever is greatest
- Oxidation-Reduction Potential (ORP): +/- 20 mV
- pH: +/-0.2 standard units
- Specific Conductivity: +/- 3%

The flow rate was adjusted as needed to maintain approximately 300 mL/min during sampling activities. To reduce possible sample cross contamination, the flow-through cell was bypassed and gloves were replaced prior to sampling.

Sample bottles were provided by TestAmerica Laboratories, Inc. (TestAmerica) for the following analyses:

- VOCs USEPA SW-846 Method 8260B
- MNA parameters alkalinity (Methods 310.1 and SM 2320B), carbon dioxide (Method SM 4500 CO2C), chloride (USEPA Method 352.5), total and dissolved iron and total and dissolved manganese (USEPA SW-846 Method 6010C), methane, ethane and ethylene (RSK-175), nitrate (USEPA Method 353.2), sulfate (USEPA Method 375.4), and total and dissolved organic carbon (USEPA Method 415.1)

VOC sample bottles were filled first followed by gas sensitive parameters and general chemistry parameters. Ferrous iron was field analyzed with a HACH 890 Colorimeter and HACH AccuVac® ampules. Samples collected for ferrous iron and dissolved analyses were field filtered using an in-line 0.2 micron disposable filter. Groundwater purging and sampling forms are included in Appendix A.

# 2.3 Quality Assurance and Sample Handling

Two (2) analytical duplicates (AD), two (2) equipment blanks (EB) and one (1) matrix spike/matrix spike duplicate (MS/MSD) pairs were collected during the 4Q17 LTMP sampling event. Laboratory provided trip blanks were included in each cooler containing samples for VOC analysis, for a total of four (4) trip blanks. Sample bottles were labeled with the date and time of sample collection, sampler initials, analysis requested, preservative used, and sample identification based on the following nomenclature "AAA-MW#-MMYY-QA/QC" or "BBBB-MMYY-QA/QC" where:

- "AAA" denotes "Benzene Storage Area (BSA)", "Chlorobenzene Process Area (CPA)", "East St. Louis (ESL)", or "Groundwater Elevation (GWE)" and "MW#" denotes "Monitoring Well Number"
- **BBBB**" denotes PM1M or PM1D for monitoring wells installed in January 2015
- "MMYY" denotes month and year of sampling quarter, e.g.: December (4<sup>th</sup> quarter), 2017 (1217)
- "QA/QC" denotes QA/QC sample
  - AD Analytical Duplicate
  - **EB** Equipment Blank
  - MS or MSD Matrix Spike or Matrix Spike Duplicate





Samples that were field filtered with an in-line 0.2 micron filter include "F(0.2)" prior to the "MMYY" portion of the sample identification. Sample information was recorded on a chain-of-custody (COC) that included project identification, sample identification, date and time of sample collection, analysis requested, preservative used, sample matrix and type, number of sample containers, sampler signature, and date COC was completed. Copies of the COCs are included in Appendix B.

Directly after sampling, sample bottles were placed in an iced cooler to maintain a sample temperature of approximately 4°C. Prior to sample shipment, samples and ice were placed inside two (2) contractor trash bags. The bags were tied and the cooler was sealed between the lid and sides with a signed and dated custody seal. Samples were shipped overnight via FedEx to the TestAmerica facility in Savannah, Georgia.

# 2.4 Biodegradation Sampling

Bio-Trap® and SIP results are evaluated to provide biodegradation potential information in the SHU, the MHU and the DHU. Bio-Trap® samplers and SIPs are passive sampling tools that collect microbes across the samplers membrane that is, after time, analyzed. SIPs are baited with a specially synthesized form of the contaminant (i.e., benzene, chlorobenzene) in order to measure the degradation of a specific contaminant.

Bio-Trap® samplers and Stable Isotope Probing samplers (SIPs), provided by Microbial Insights, Inc. in Rockford, Tennessee, were deployed on November 1, 2017 in monitoring wells downgradient of the former Chlorobenzene Process Area (CPA-MW-1D through CPA-MW-5D) and downgradient of the former Benzene Storage Area (BSA-MW-1S and BSA-MW-2D through BSA-MW-5D) for PLFA analysis. A benzene SIP was deployed in monitoring well BSA-MW-2D and a chlorobenzene SIP was deployed in monitoring well CPA-MW-3D. Bio-Trap® samplers and SIPs were weighted and fastened to a stainless steel cable. The cable was secured to the well cap and the Bio-Trap® or SIP was lowered into the well and placed in the middle of the well screen.

On November 30, 2017, Bio-Trap® samplers and SIPs were collected from the wells, placed in laboratory provided bags, labeled with appropriate well identification, placed in a cooler with ice, properly sealed, and shipped overnight to the Microbial Insights, Inc. facility in Rockford, Tennessee for analysis.

# 2.5 Decontamination and Investigation Derived Waste

Sampling equipment was decontaminated prior to mobilizing to the Site, between sample locations and prior to demobilizing from the Site. Non-dedicated sampling equipment was decontaminated between samples with a non-phosphatic detergent solution and a deionized water rinse.





Investigation derived waste (IDW) was placed in 55-gallon drums, labeled with the generation date and staged for disposal by Solutia. IDW such as gloves and other disposable sampling equipment was bagged for disposal by Solutia.

# 3.0 QUALITY ASSURANCE

Sample results were provided by TestAmerica in electronic format and reviewed for quality and completeness by Golder in accordance with the Work Plan. Results were submitted in four (4) sample delivery groups (SDGs) as follows:

Sample Delivery Group (SDG)	Sample Identification
	PM1D-1217
KPS205	ESL-MW-D1-1217
11 3205	GWE-5D-1217
	4Q17 LTM Trip Blank #1
	GWE-2D-1217
	GWE-3D-1217
KPS206	BSA-MW-5D-1217
	CPA-MW-4D-1217
	CPA-MW-5D-1217
	4Q17 LTM Trip Blank #2
	BSA-MW-2D-1217
	BSA-MW-3D-1217
	BSA-MW-3D-1217-EB
KPS200	BSA-MW-4D-1217
	CPA-MW-1D-1217
	CPA-MW-3D-1217
	CPA-MW-3D-1217-AD
	4Q17 LTM Trip Blank #3
	BSA-MW-1S-1217
	BSA-MW-1S-1217-EB
KPS201	CPA-MW-2D-1217
	CPA-MW-2D-1217-AD
	4Q17 LTM Trip Blank #4

Golder completed validation of the analytical data following the general guidelines in Section 4.4 Data Review and Validation of the Work Plan. The most recent versions of the national data validation guidelines were used for data review. The following guidelines were generally used:

- USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review, EPA-540-R-2017-002, January 2017
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Methods Data Review, EPA 540-R-2017-001, January 2017





Although some data required qualifications due to quality control criteria that were not achieved, the data was deemed usable. The completeness for the data set was 100%. Qualifications are included in Appendix C.

# 4.0 **OBSERVATIONS**

Groundwater analytical data for VOCs and MNA parameters are discussed below and presented in Table 2 and 3, respectively. The groundwater analytical laboratory results including data validation reports are included in Appendix D.

# 4.1 Benzene

Benzene was detected in six (6) of the fifteen (15) monitoring wells and piezometers at concentrations ranging from 3.4  $\mu$ g/L (GWE-5D) to 430,000  $\mu$ g/L (BSA-MW-1S). Benzene results are summarized below.

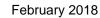
- Former Benzene Storage Area: Benzene was detected in the former Benzene Storage Area source area well (BSA-MW-1S) at a concentration of 430,000 μg/L.
- Downgradient of Former Benzene Storage Area: Benzene was detected in two (2) of four (4) wells downgradient of the former Benzene Storage Area at concentrations ranging from 20 µg/L (BSA-MW-3D) to 16,000 µg/L (BSA-MW-2D).
- Former Chlorobenzene Process Area: Benzene was detected in the former Chlorobenzene Process Area source area well (CPA-MW-1D) at a concentration of 3,400 μg/L.
- Downgradient of Former Chlorobenzene Process Area: Benzene was detected in one (1) of the four (4) wells downgradient of the former Chlorobenzene Process Area at a concentration of 6.8 / 6.6 μg/L (CPA-MW-3D and AD).
- North of the Site: Benzene was detected in one (1) of five (5) wells and piezometers north of the Site at a concentration of 3.4 μg/L (GWE-5D).

# 4.2 Chlorobenzenes (Total)

Total chlorobenzenes (i.e., sum of chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene) were detected in fourteen (14) of the fifteen (15) wells at concentrations ranging from  $37 \mu g/L$  (PM1D) to 35,500  $\mu g/L$  (CPA-MW-1D). Total chlorobenzenes results are summarized below.

- Former Benzene Storage Area: Total chlorobenzenes were not detected in the former Benzene Storage Area source area well (BSA-MW-1S).
- Downgradient of Former Benzene Storage Area: Total chlorobenzenes were detected in four (4) of four (4) wells downgradient of the former Benzene Storage Area with concentrations ranging from 100 µg/L (BSA-MW-5D) to 1,859 µg/L (BSA-MW-4D) in the DHU north of the GMCS.
- Former Chlorobenzene Process Area: Total chlorobenzenes were detected in the former Chlorobenzene Process Area source area well (CPA-MW-1D) at a concentration of 35,500 µg/L.
- Downgradient of Former Chlorobenzene Process Area: Total chlorobenzenes were detected in four (4) of four (4) wells downgradient of the former Chlorobenzene Process Area with concentrations ranging from 142.2 µg/L (CPA-MW-4D) to 22,700 / 22,730 µg/L (CPA-MW-2D and AD).





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North of the Site: Total chlorobenzenes were detected in five (5) of five (5) wells and piezometers north of the Site with concentrations ranging from 37 μg/L (PM1D) to 1,850 μg/L (GWE-3D).

# 4.3 Monitored Natural Attenuation

MNA parameter data for this quarter are presented in Table 3. Laboratory results for PLFA and SIP analysis are included in Appendix F. The SIP study (Appendix F) states the following:

- "The detection of <sup>13</sup>C-enriched biomass confirmed that benzene biodegradation had occurred at BSA-MW-2D-1217 during the deployment period".
- Dissolved inorganic carbon (DIC) data for BSA-MW-2D-1217 indicate that "moderate benzene mineralization occurred during the deployment period."
- "The detection of <sup>13</sup>C-enriched biomass confirmed that chlorobenzene biodegradation had occurred at CPA-MW-3D-1217 during the deployment period."
- The DIC data for CPA-MW-3D-1217 indicate that "little to no chlorobenzene mineralization occurred during the deployment period."
- The PLFA analysis in the remaining BSA and CPA wells also show a community structure containing contaminant-reducing bacteria.

# 5.0 CLOSING

Golder appreciates the opportunity to assist Solutia Inc. with the Long-Term Monitoring Program sampling events. Please contact the undersigned if you need additional information.

Sincerely,

#### GOLDER ASSOCIATES INC.

Somanthe Filings

Samantha J. DiCenso, E.I.T. Staff Environmental Engineer

March N. efalland

Mark N. Haddock, R.G., P.E. Principal, Senior Consultant





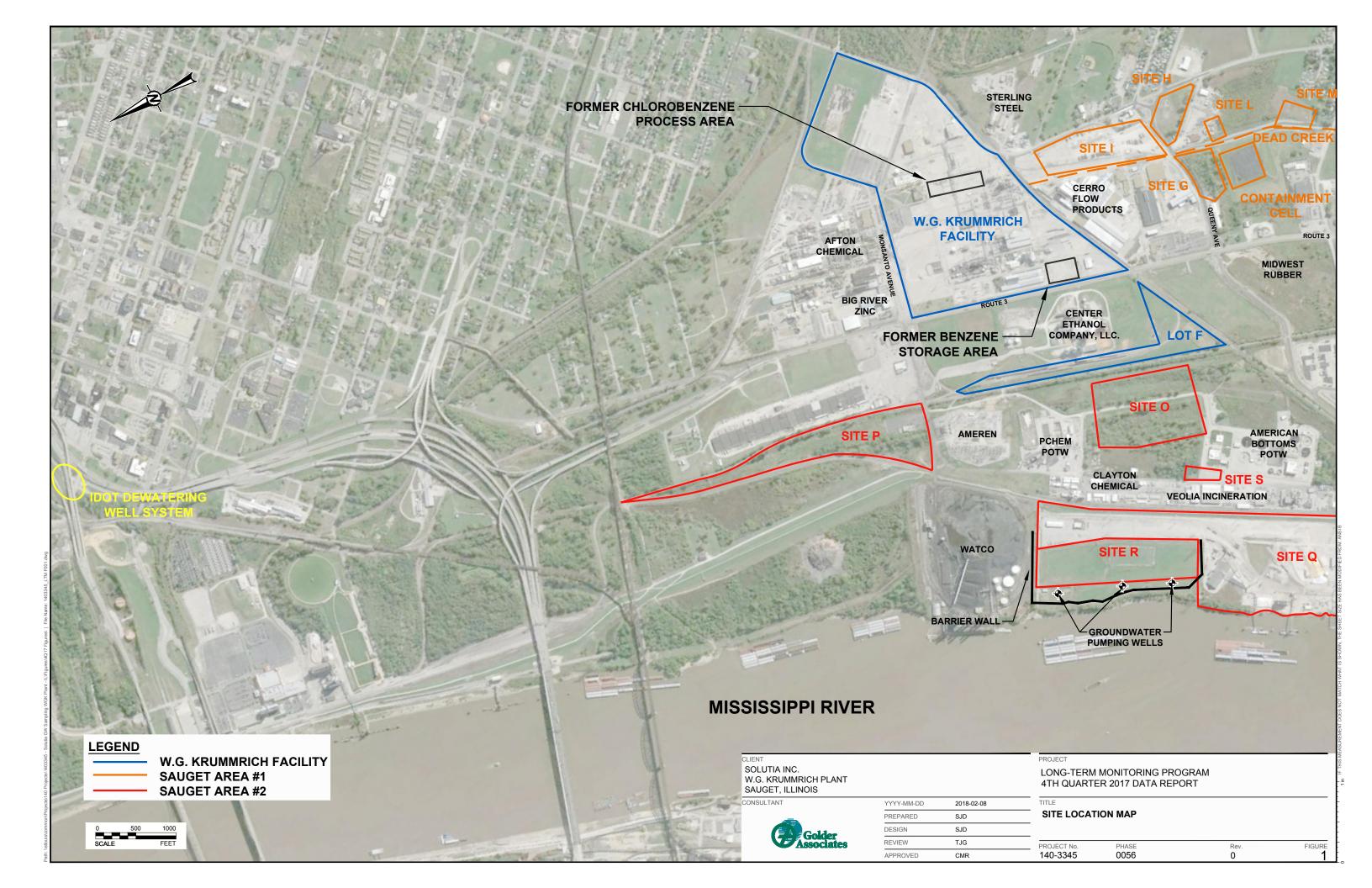
## 6.0 **REFERENCES**

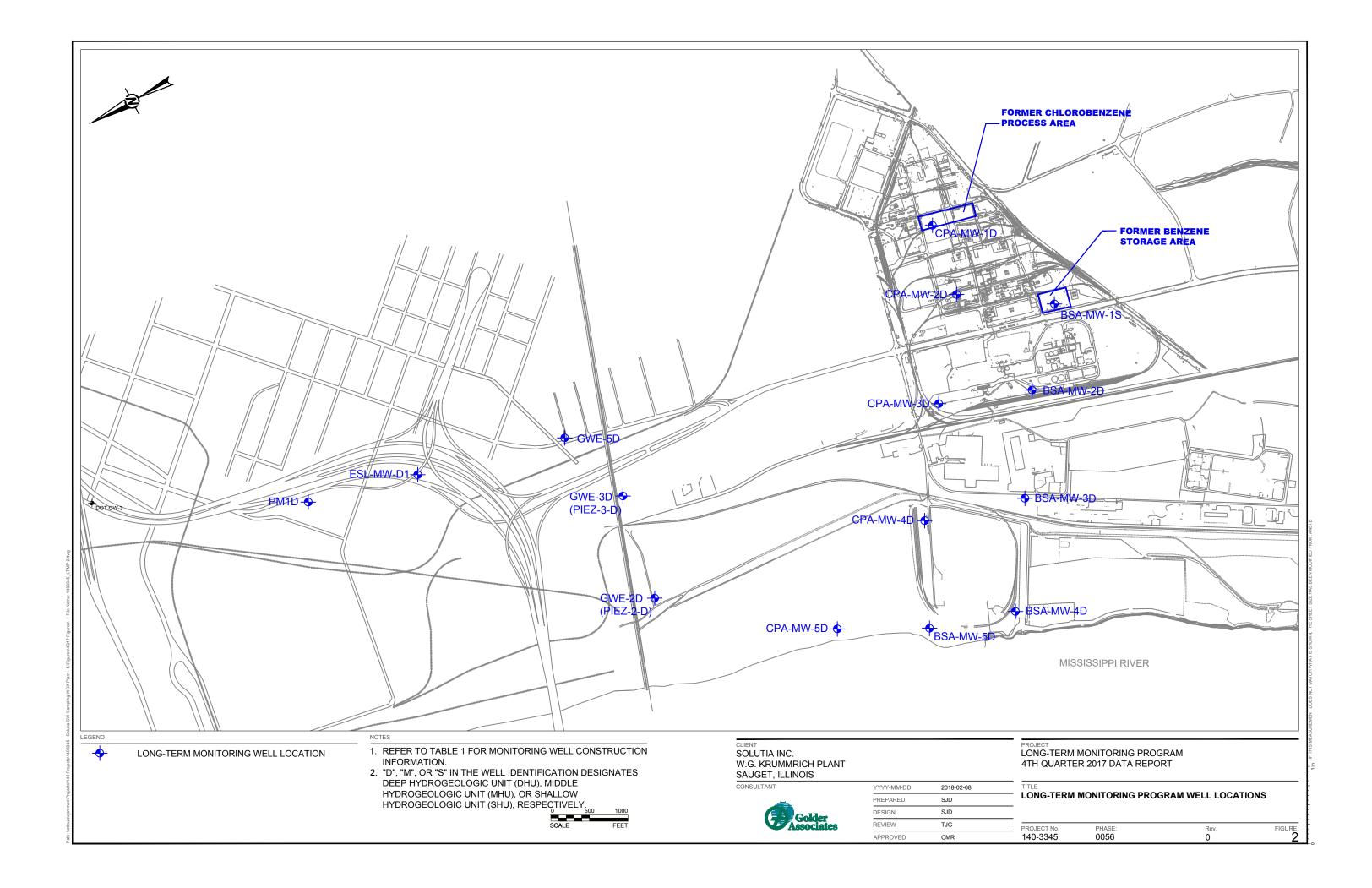
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- USEPA, 2017. Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Methods Data Review.
- USEPA, 2017. Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review.

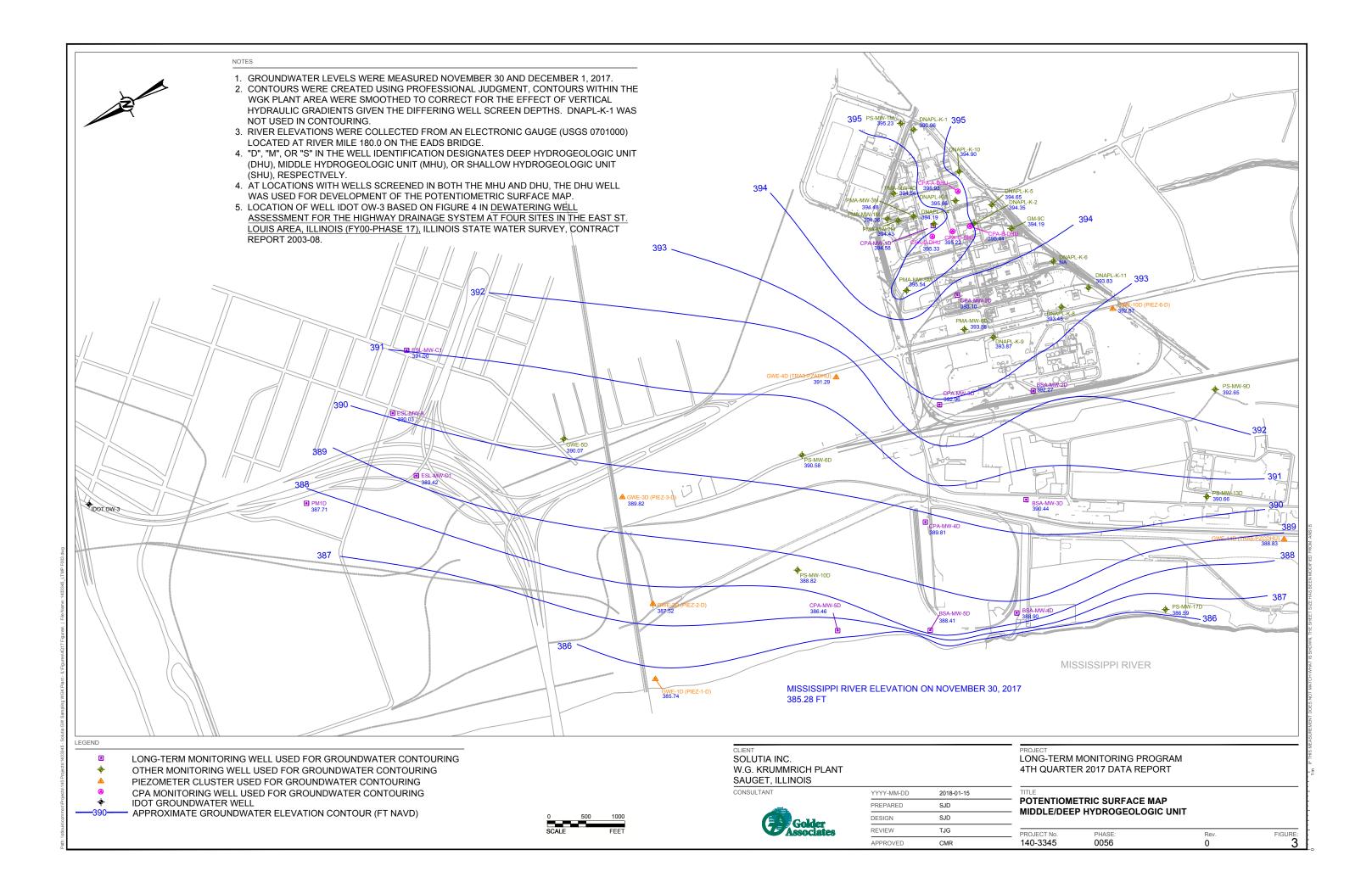
USEPA, 2008. Final Decision, Solutia Inc., Sauget, Illinois, February 2008.

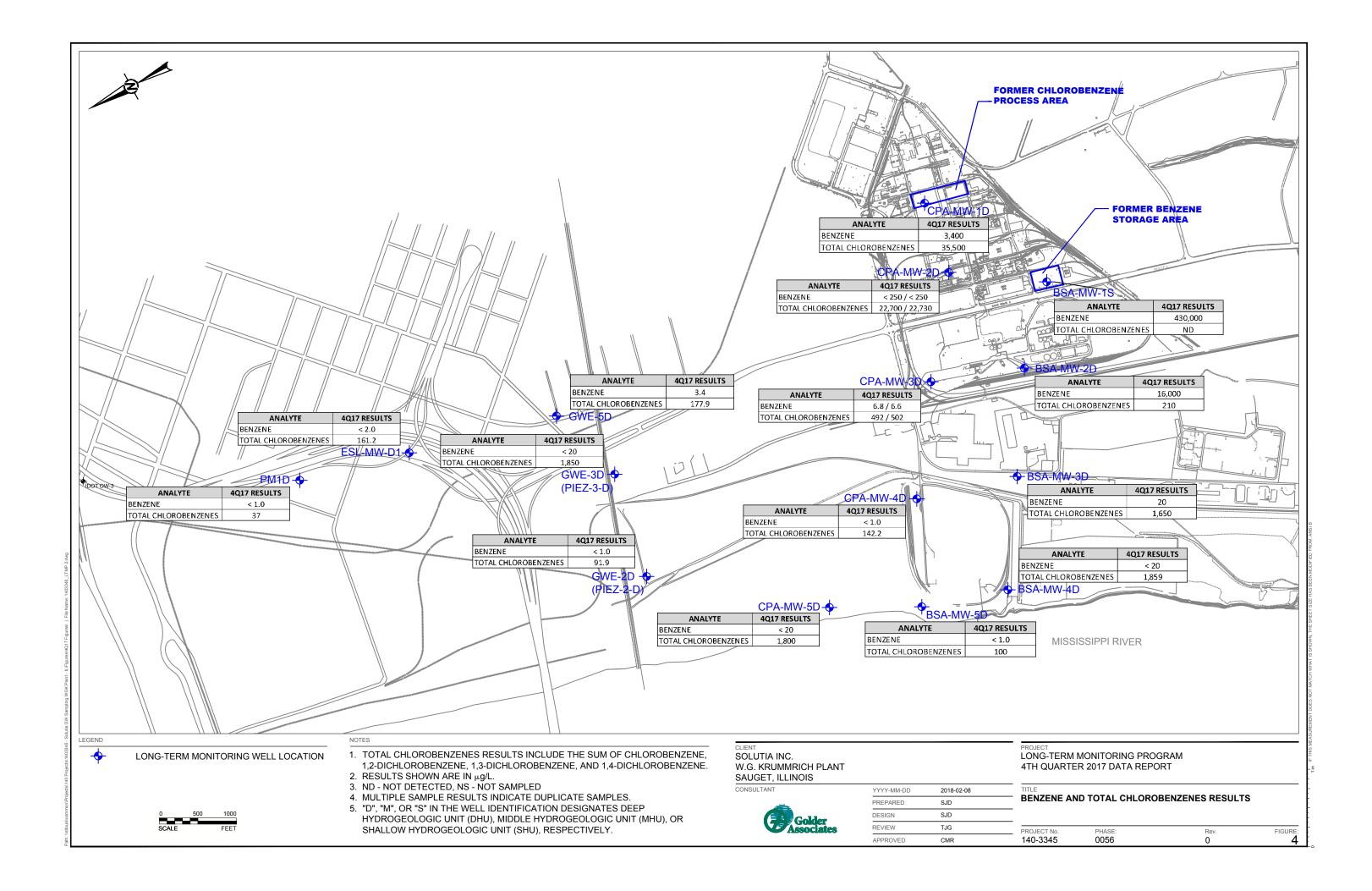


FIGURES









TABLES

#### Table 1 Monitoring Well Gauging Information 4Q17 Long-Term Monitoring Program Solutia Inc., W.G. Krummrich Plant Sauget, Illinois

		Mor	nitoring Well	Construction	Data		4Q17 - N	ovember 30	and Decemb	er 1, 2017
	Ground	Top of	Top of	Bottom of	Top of	Bottom of			<b>_</b> .	
Well Identification	Surface	Casing	Screen	Screen	Screen	Screen	Water Level	Depth to	Total	Water Level
	Elevation <sup>1</sup>	Elevation <sup>1</sup>	Depth	Depth	Elevation <sup>1</sup>	Elevation <sup>1</sup>	(ft btoc)	NAPL	Depth <sup>2</sup>	Elevation <sup>1</sup>
	(ft)	(ft)	(ft bgs)	(ft bgs)	(ft)	(ft)	, ,	(ft btoc)	(ft btoc)	(ft)
SHU 395-380 ft NAV			(	(	(	()				1
BSA-MW-1S	409.49	412.31	19.68	24.68	389.81	384.81	18.73	NP	27.34	393.58
GWE-5S	408.47	408.05	17.91	27.91	390.56	380.56	17.75	NP	27.86	390.30
MHU 380-350 ft NA		100105	17101	27132	550150	500150	17175		27100	550150
GWE-5M	408.59	408.20	48.10	58.10	360.49	350.49	17.94	NP	58.18	390.26
PMA-MW-1M	410.32	410.08	54.54	59.54	355.78	350.78	15.72	NP	59.63	394.36
PMA-MW-2M	412.26	411.93	56.87	61.87	355.39	350.39	17.50	NP	61.32	394.43
PMA-MW-3M	412.36	412.10	57.07	62.07	355.29	350.29	17.62	NP	61.54	394.48
PMA-MW-5M	411.27	410.97	52.17	57.17	359.10	354.10	15.43	NP	57.02	395.54
PS-MW-1M	409.37	412.59	37.78	42.78	371.59	366.59	17.36	NP	46.01	395.23
PM1M	413.07	412.80	51.64	61.41	361.43	351.66	24.11	NP	30.46	388.69
DHU 350 ft NAVD 88		112100	51101	01/11	501115	551100			50110	500.05
BSA-MW-2D	412.00	415.13	68.92	73.92	343.08	338.08	22.86	NP	76.98	392.27
BSA-MW-3D	412.00	415.74	107.02	112.02	305.89	300.89	25.30	NP	114.74	390.44
BSA-MW-4D	425.00	424.69	118.54	123.54	306.46	301.46	35.79	NP	123.12	388.90
BSA-MW-5D	420.80	424.09	115.85	123.34	304.95	299.95	32.08	NP	123.12	388.41
CPA-A-DHU	413.95	416.24	108.00	113.30	305.95	300.65	20.31	NP	115.24	395.93
CPA-B-DHU	409.12	408.68	103.00	106.50	308.12	302.62	13.24	NP	105.53	395.44
CPA-C-DHU	403.12	408.57	101.00	106.00	307.92	302.02	13.35	NP	105.46	395.22
CPA-D-DHU	409.63	408.37	101.00	105.90	308.63	303.73	16.87	NP	103.40	395.33
CPA-D-DHO	409.03	412.20	66.12	71.12	342.50	337.50	17.65	NP	74.68	394.58
CPA-MW-2D	408.51	408.20	99.96	104.96	308.55	303.55	15.10	NP	104.61	393.10
CPA-MW-2D	410.87	408.20	108.20	113.20	302.67	297.67	17.71	NP	112.72	392.96
CPA-MW-3D CPA-MW-4D	421.57	410.07	116.44	121.44	305.13	300.13	31.39	NP	120.93	389.81
CPA-MW-4D	411.03	413.15	107.63	112.63	303.40	298.40	26.69	NP	114.71	386.46
DNAPL-K-1	413.07	415.56	107.03	123.20	303.40	238.40	24.60	NP	123.03	390.96
DNAPL-K-2	407.94	413.30	97.63	112.63	310.31	295.31	13.37	NP	112.36	394.35
DNAPL-K-3	412.13	415.91	104.80	112.05	307.33	292.33	20.25	NP	123.23	395.66
DNAPL-K-4	409.48	413.51	104.80	117.55	306.93	292.33	18.34	NP	118.27	393.00
DNAPL-K-5	403.48	412.55	102.35	117.15	310.12	291.93	17.26	NP	116.45	394.15
DNAPL-K-6	410.43	410.09	102.13	117.13	307.96	293.12	17.20	NP	116.84	394.05
DNAPL-K-8	408.56	410.03	102.47	117.65	305.91	292.90	17.93	NP	117.53	393.45
DNAPL-K-9	406.45	405.97	97.42	117.03	309.03	290.91	17.55	NP	117.53	393.43
DNAPL-K-10	400.43	403.97	105.43	112.42	309.03	294.03	12.10	NP	120.11	393.87
DNAPL-K-10 DNAPL-K-11	413.30	413.23	105.45	120.43	306.74	293.07	17.95	NP	120.11	393.83
GM-9C	412.20	411.78	88.00	120.40	321.54	301.54	17.95	NP	120.23	393.83
GWE-1D	409.34	411.21 415.60			295.80	285.80	29.86	NP	108.10	385.74
GWE-1D GWE-2D	412.80	415.60	117.00 127.00	127.00 137.00	295.80	285.80	29.80	NP	136.62	385.74
GWE-2D GWE-3D	417.45	417.14	127.00	137.00	313.06	303.06	29.82	NP	136.62	389.82
GWE-3D GWE-4D	415.03	417.00	74.00	80.00	313.06	303.06	14.45	NP	78.74	389.82
GWE-4D GWE-5D	406.05	405.74	100.43	105.43	332.05	326.05	14.45	NP	105.12	391.29
GWE-3D GWE-10D	408.79	408.38	100.43	105.43	308.36	297.65	20.00	NP	105.12	390.07
GWE-10D GWE-14D	410.15	412.87	90.00	96.00	307.65	324.47	34.07	NP	96.98	392.87
ESL-MW-A	420.47	422.90		96.00		324.47	22.56	NP		
ESL-MW-C1	412.93	412.59	105.50 104.00	10.50	307.43 306.09	302.43	18.79	NP	109.87 108.63	390.03 391.00
ESL-MW-D1	410.09	409.79	104.00	109.00	306.09	297.38	26.62	NP	108.63	391.00
PMA-MW-4D	410.38	410.04	68.84	73.84	302.38	337.38	16.34	NP	73.28	389.42
PMA-MW-4D PMA-MW-6D	411.22 407.63	410.88	96.49	101.49	342.38 311.14	337.38	16.34	NP	101.19	
PNIA-NIW-6D PS-MW-6D	407.63	407.32	102.32	101.49	304.31		13.44	NP	101.19	393.88 390.58
						299.31				
PS-MW-9D	403.92	403.52	100.40	105.40	303.52	298.52	10.87	NP	105.21	392.65
PS-MW-10D	409.63	412.18	103.78	108.78 111.08	308.40	303.40	23.36	NP	111.36	388.82
PS-MW-13D	405.80	405.53	106.08		299.72	294.72	14.87	NP	110.60	390.66
PS-MW-17D	420.22	423.26	121.25	126.25	298.97	293.97	36.67	NP	133.88	386.59
SA2-MW-1D	403.79	406.03	105.01	115.01	301.02	291.02	24.01	NP	102.27	382.02
PM1D	413.41	412.78	101.42	106.45	311.99	306.96	25.07	NP	106.61	387.7

### Notes

ft - feet bgs - below ground surface

btoc - below top of casing

NP - no product observed

SHU - shallow hydrogeologic unit

MHU - middle hydrogeologic unit

DHU - deep hydrogeologic unit

<sup>1</sup> - Elevation based on North American Vertical Datum (NAVD) 88 datum

<sup>2</sup> - Total depths are measured annually during the first quarter of each year

February 2018

Prepared By: SJD 12/21/2017 Checked By: TJG 12/22/2017 Reviewed By: CMR 02/16/2018

#### Table 2 **Groundwater Analytical Results** 4Q17 Long-Term Monitoring Program Solutia Inc., W.G. Krummrich Plant Sauget, Illinois

				VOCs (µg/L)		
Sample Identification	Sample Date	Benzene	Chlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene
Benzene Storage Area						
BSA-MW-1S-1217	12/7/2017	430,000 D	<5,000	<5,000	<5,000	<5,000
BSA-MW-2D-1217	12/6/2017	16,000 D	210 D	<100	<100	<100
BSA-MW-3D-1217	12/6/2017	20 D	1,400 D	<20	<20	250 D
BSA-MW-4D-1217	12/6/2017	<20	1,800 D	<20	<20	59 D
BSA-MW-5D-1217	12/5/2017	<1.0	100	<1.0	<1.0	<1.0
Chlorobenzene Process	Area	·	·	·	·	
CPA-MW-1D-1217	12/6/2017	3,400 D	17,000 D	9,600 D	1,100 D	7,800 D
CPA-MW-2D-1217	12/7/2017	<250	22,000 D	<250	<250	700 D
CPA-MW-2D-1217-AD	12/7/2017	<250	22,000 D	<250	<250	730 D
CPA-MW-3D-1217	12/6/2017	6.8 D	480 D	<5.0	<5.0	12 D
CPA-MW-3D-1217-AD	12/6/2017	6.6 D	490 D	<5.0	<5.0	12 D
CPA-MW-4D-1217	12/5/2017	<1.0	140	<1.0	<1.0	2.2
CPA-MW-5D-1217	12/5/2017	<20	1,800 D	<20	<20	<20
North of W.G. Krummrid	ch Facility					
ESL-MW-D1-1217	12/4/2017	<2.0	140 D	2.2 D	<2.0	19 D
GWE-2D-1217	12/5/2017	<1.0	89	1.5	<1.0	1.4
GWE-3D-1217	12/5/2017	<20	1,700 D	<20	<20	150 D
GWE-5D-1217	12/4/2017	3.4	150	3.7	1.2	23
PM1D-1217	12/4/2017	<1.0	37	<1.0	<1.0	<1.0

#### Notes

VOCs - volatile organic compounds µg/L - micrograms per liter < - result is non-detect, less than the reporting limit D - compound analyzed at a dilution

Prepared By: SJD 02/08/2018 Checked By: TJG 02/12/2018 Reviewed By: CMR 02/16/2018

AD - analytical duplicate

Bold - indicates concentration greater than reporting limit

#### Table 3 Monitored Natural Attenuation Results 4Q17 Long-Term Monitoring Program Solutia Inc., W.G. Krummrich Plant Sauget, Illinois

	<u> </u>	Sauget, minors																
	Monitored Natural Attenuation Parameters																	
Sample Identification	Sample Date	Alkalinity (mg/L)	Carbon Dioxide (mg/L)	Chloride (mg/L)	Dissolved Oxygen (mg/L)	Ethane (ug/L)	Ethylene (ug/L)	Ferrous Iron (mg/L)	Iron (mg/L)	Iron, Dissolved (mg/L)	Manganese (mg/L)	Manganese, Dissolved (mg/L)	Methane (ug/L)	Nitrogen, Nitrate (mg/L)	Sulfate as SO4 (mg/L)	Total Organic Carbon (mg/L)	Dissolved Organic Carbon (mg/L)	ORP ( mV)
Benzene Storage Area																		
BSA-MW-1S-1217	12/7/2017	1,200 J	440 J	370 D	0.12	<1.1	<1.0	-	25	-	2.2	-	3,600 J	<0.050 J	66 D	12	-	-116.22
BSA-MW-1S-F(0.2)-1217	12/7/2017	-	-	-	-	-	-	0.44	-	26	-	2.3		-	-	-	12	-
BSA-MW-2D-1217	12/6/2017	740 J	110 J	200 D	0.12	5.2	<1.0	-	8.2	-	0.94	-	17,000	0.087	<5.0	9.4	-	-103.31
BSA-MW-2D-F(0.2)-1217	12/6/2017	-	-	-	-	-	-	0.0	-	8.1	-	0.94		-	-	-	9.6	-
BSA-MW-3D-1217	12/6/2017	610 J	78 J	440 D	0.13	<1.1	<1.0	-	14	-	0.69	-	630	<0.050 J	<5.0	4.0	-	-104.61
BSA-MW-3D-F(0.2)-1217	12/6/2017	-	-	-		-	-	0.0	-	14	-	0.71	-	-	-	-	4.2	-
BSA-MW-4D-1217	12/6/2017	550	19	140 D	0.14	<1.1	<1.0	-	7.8	-	0.54	-	120	<0.050 J	140 D	4.3	-	-100.90
BSA-MW-4D-F(0.2)-1217	12/6/2017	-	-	-	-	-	-	0.50	-	7.7	-	0.53	-	-	-	-	4.4	-
BSA-MW-5D-1217	12/5/2017	580 J	67 J	170 D	0.12	9.2	<1.0	-	12	-	0.26	-	5,900	<0.050 J	<5.0	7.8	-	-122.19
BSA-MW-5D-F(0.2)-1217	12/5/2017	-	-	-		-	-	1.08	-	12	-	0.26	-	-	-	-	9.5	-
Chlorobenzene Process Area																		
CPA-MW-1D-1217	12/6/2017	790 J	22 J	380 D	0.06	13	<1.0	-	0.30	-	0.20	-	12,000	<0.050	<5.0	7.4	-	-135.33
CPA-MW-1D-F(0.2)-1217	12/6/2017	-	-	-	-	-	-	0.0	-	0.18	-	0.20	-	-	-	-	7.9	-
CPA-MW-2D-1217	12/7/2017	480 J	67 J	49	0.20	<1.1	<1.0	-	7.7	-	0.45	-	990 J	<0.050	47 D	5.9	-	-97.08
CPA-MW-2D-F(0.2)-1217	12/7/2017	-	-	-	-	-	-	1.40	-	7.6	-	0.45	-	-	-	-	5.8	-
CPA-MW-3D-1217	12/6/2017	520 J	48 J	76 D	0.11	6.4	<1.0	-	8.8	-	0.53	-	2,500	<0.050	36 D	6.1	-	-117.01
CPA-MW-3D-F(0.2)-1217	12/6/2017	-	-	-	-	-	-	0.0	-	9.2	-	0.53	-	-	-	-	6.4	-
CPA-MW-4D-1217	12/5/2017	610 J	78 J	210 D	0.13	7.8	<1.0	-	15	-	0.41	-	11,000	<0.050 J	<5.0	7.4	-	-129.31
CPA-MW-4D-F(0.2)-1217	12/5/2017	-	-	-	-	-	-	0.0	-	15	-	0.41	-	-	-	-	7.5	-
CPA-MW-5D-1217	12/5/2017	600 J	110 J	200 D	0.11	<1.1	<1.0	-	17	-	0.66	-	87	<0.050 J	40 D	5.2	-	-89.75
CPA-MW-5D-F(0.2)-1217	12/5/2017	-	-	-	-	-	-	0.0	-	16	-	0.66	-	-	-	-	5.4	-
North of W.G. Krummrich Facili			-			-	-		1	1	1		1	1	1	1	1	_
ESL-MW-D1-1217	12/4/2017	270	350	93 D	0.15	<1.1	<1.0	-	12	-	0.38	-	52	<0.050 J	490 D	2.9	-	-110.68
ESL-MW-D1-F(0.2)-1217	12/4/2017	-	-	-	-	-	-	0.43	-	12	-	0.38	-	-	-	-	3.9	-
GWE-2D-1217	12/5/2017	370 J	57 J	640 D	0.24	<1.1	<1.0	-	18	-	0.42	-	12	<0.050 J	730 D	3.7	-	-86.28
GWE-2D-F(0.2)-1217	12/5/2017	-	-	-	-	-	-	0.0	-	18	-	0.44	-	-	-	-	4.2	-
GWE-3D-1217	12/5/2017	450 J	89 J	1,500 D	0.23	<1.1	<1.0	-	28	-	0.86	-	79	<0.050 J	380 D	6.7	-	-107.88
GWE-3D-F(0.2)-1217	12/5/2017	-	-	-	-	-	-	0.0	-	27	-	0.82	-	-	-	-	6.9	-
GWE-5D-1217	12/4/2017	360 J	52 J	81 D	0.14	<1.1	<1.0	-	14	-	0.44	-	72	<0.050 J	460 D	3.2	-	-103.95
GWE-5D-F(0.2)-1217 PM1D-1217	12/4/2017	-	-	- 77 D	-	-	-	0.25	-	14	-	0.43	- 68	-	-	-	3.3	-
	12/4/2017	210	3,400		0.12	<1.1	<1.0	-	14	- 15	0.51	-		<0.050 J	280 D	2.5	-	-142.79
PM1D-F(0.2)-1217	12/4/2017	-	-	-	-	-	-	0.67	-	15	-	0.53	-	-	-	-	2.7	-

#### Notes

Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) values represent the final field measurements prior to sampling (In-Situ - SmartTrolI™) Ferrous Iron was field measured using a 0.2 µm field filtered sample (Hach DR-890 Colorimeter)

F(0.2) - sample was field filtered using a 0.2  $\mu m$  filter during sample collection

µg/L - micrograms per liter

mg/L - milligrams per liter

mV - millivolts

< - result is non-detect, less than the reporting limit

"-" - not analyzed

D - compound analyzed at a dilution

J - result is an estimated value

Prepared By: SJD 02/08/2018 Checked By: TJG 02/12/2018 Reviewed By: CMR 02/16/2018

### APPENDIX A GROUNDWATER PURGING AND SAMPLING FORMS

(On CD)



	mc.	12/7/2017	ISI Low-Flow Log		
Project Information:		Pump Information:			
Operator Name	TJG	Pump Model/Type	SS Monsoon		
Company Name	Golder Associates	Tubing Type	LDPE		
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in		
Site Name	LTM	Tubing Length	31.00 ft		
		Pump Placement from TOC	25.00 ft		
Well Information:		Pumping Information:			
Well Id	BSA-MW-1S	Final Pumping Rate	200 mL/min		
Well Diameter	2 in	System Volume	363 mL		
Well Total Depth	27.34 ft	Calculated Sample Rate	108 sec		
Depth to Top of Screen	22.50 ft	Sample Rate	108 sec		
Screen Length	5 ft	Stabilized Drawdown	0.00 ft		
Depth to Water	18.95 ft				

# Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	9:59:15	15.64	7.07	3128.17	6.18	0.18	-94.88
	10:00:26	15.92	7.07	3115.88	5.61	0.16	-102.78
Last 5 Readings	10:01:37	16.00	7.06	3130.04	5.88	0.15	-108.37
	10:02:48	16.18	7.05	3135.84	5.32	0.13	-112.66
	10:03:59	16.19	7.06	3109.06	4.63	0.12	-116.22
		0.08	-0.01	14.16	0.27	-0.01	7.64
Variance in Last 3 Readings		0.18	-0.01	5.80	-0.56	-0.02	-4.29
		0.01	0.01	-26.78	-0.69	-0.01	-3.56



	mc.	12/6/2017	ISI Low-Flow Log		
Project Information:		Pump Information:			
Operator Name	TJG	Pump Model/Type	SS Monsoon		
Company Name	Golder Associates	Tubing Type	LDPE		
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in		
Site Name	LTM	Tubing Length	80.55 ft		
		Pump Placement from TOC	74.55 ft		
Well Information:		Pumping Information:			
Well Id	BSA-MW-2D	Final Pumping Rate	300 mL/min		
Well Diameter	2 in	System Volume	639 mL		
Well Total Depth	76.98 ft	Calculated Sample Rate	127 sec		
Depth to Top of Screen	72.05 ft	Sample Rate	127 sec		
Screen Length	5 ft	Stabilized Drawdown	0.00 ft		
Depth to Water	23.14 ft				

# Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	10:34:17	16.02	6.97	1974.59	2.43	0.20	-87.37
	10:36:24	16.32	6.96	1983.54	1.02	0.16	-96.25
Last 5 Readings	10:38:31	16.58	6.96	1966.05	0.86	0.13	-100.27
	10:40:38	16.59	6.96	1957.71	1.06	0.12	-102.19
	10:42:46	16.48	6.96	1966.72	0.71	0.12	-103.31
		0.26	0.00	-17.49	-0.16	-0.03	-4.02
Variance in Last 3 Readings		0.01	0.00	-8.34	0.2	-0.01	-1.92
		-0.11	0.00	9.01	-0.35	0.00	-1.12



win-Situme.		12/6/2017	ISI Low-Flow Log
Project Information:		Pump Information:	
Operator Name	TJG	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	118.35 ft
		Pump Placement from TOC	112.35 ft
Well Information:		Pumping Information:	
Well Id	BSA-MW-3D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	850 mL
Well Total Depth	114.75 ft	Calculated Sample Rate	169 sec
Depth to Top of Screen	109.85 ft	Sample Rate	169 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	24.61 ft		

# Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	9:32:36	15.15	6.97	2416.61	34.0	0.43	-81.79
	9:35:25	15.64	6.97	2433.45	17.9	0.27	-94.57
Last 5 Readings	9:38:14	15.96	6.96	2408.49	11.8	0.20	-99.10
	9:41:03	16.09	6.96	2403.69	6.74	0.16	-102.21
	9:43:52	16.19	6.96	2404.90	4.76	0.13	-104.61
		0.32	-0.01	-24.96	-6.10	-0.07	-4.53
Variance in Last 3 Readings		0.13	0.00	-4.80	-5.06	-0.04	-3.11
		0.10	0.00	1.21	-1.98	-0.03	-2.40



win-Situme.		12/6/2017	ISI Low-Flow Log	
Project Information:		Pump Information:		
Operator Name	TJG	Pump Model/Type	SS Monsoon	
Company Name	Golder Associates	Tubing Type	LDPE	
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in	
Site Name	LTM	Tubing Length	126.73 ft	
		Pump Placement from TOC	120.73 ft	
Well Information:		Pumping Information:		
Well Id	BSA-MW-4D	Final Pumping Rate	300 mL/min	
Well Diameter	2 in	System Volume	897 mL	
Well Total Depth	123.13 ft	Calculated Sample Rate	179 sec	
Depth to Top of Screen	118.23 ft	Sample Rate	179 sec	
Screen Length	5 ft	Stabilized Drawdown	0.01 ft	
Depth to Water	36.69 ft			

# Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	8:33:01	15.72	6.91	1571.78	1.96	0.24	-91.21
	8:36:00	15.96	6.93	1562.35	1.57	0.21	-96.69
Last 5 Readings	8:38:59	16.05	6.94	1561.18	1.19	0.18	-99.47
	8:41:58	16.14	6.94	1547.69	1.08	0.16	-100.07
	8:44:59	16.09	6.95	1560.88	1.08	0.14	-100.90
		0.09	0.01	-1.17	-0.38	-0.03	-2.78
Variance in Last 3 Readings		0.09	0.00	-13.49	-0.11	-0.02	-0.60
		-0.05	0.01	13.19	0.00	-0.02	-0.83



win-Situme.		12/5/2017	ISI Low-Flow Log	
Project Information:		Pump Information:		
Operator Name	TJG	Pump Model/Type	SS Monsoon	
Company Name	Golder Associates	Tubing Type	LDPE	
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in	
Site Name	LTM	Tubing Length	124.04 ft	
		Pump Placement from TOC	118.04 ft	
Well Information:		Pumping Information:		
Well Id	BSA-MW-5D	Final Pumping Rate	300 mL/min	
Well Diameter	2 in	System Volume	882 mL	
Well Total Depth	120.87 ft	Calculated Sample Rate	176 sec	
Depth to Top of Screen	115.54 ft	Sample Rate	176 sec	
Screen Length	5 ft	Stabilized Drawdown	0.00 ft	
Depth to Water	31.81 ft			

# Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	13:37:16	16.76	6.94	1615.39	4.07	0.19	-116.57
	13:40:07	16.84	6.95	1655.64	2.42	0.16	-119.02
Last 5 Readings	13:42:58	16.86	6.94	1695.11	1.29	0.15	-119.63
	13:45:52	16.92	6.95	1722.29	2.21	0.13	-121.17
	13:48:45	16.93	6.96	1727.38	1.07	0.12	-122.19
		0.02	-0.01	39.47	-1.13	-0.01	-0.61
Variance in Last 3 Readings		0.06	0.01	27.18	0.92	-0.02	-1.54
		0.01	0.01	5.09	-1.14	-0.01	-1.02



⟨𝗏 III-Situme.		12/6/2017	ISI Low-Flow Log	
Project Information:		Pump Information:		
Operator Name	TJG	Pump Model/Type	SS Monsoon	
Company Name	Golder Associates	Tubing Type	LDPE	
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in	
Site Name	LTM	Tubing Length	73.32 ft	
		Pump Placement from TOC	68.32 ft	
Well Information:		Pumping Information:		
Well Id	CPA-MW-1D	Final Pumping Rate	300 mL/min	
Well Diameter	2 in	System Volume	599 mL	
Well Total Depth	74.68 ft	Calculated Sample Rate	119 sec	
Depth to Top of Screen	65.82 ft	Sample Rate	119 sec	
Screen Length	5 ft	Stabilized Drawdown	0.00 ft	
Depth to Water	17.76 ft			

# Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	13:50:48	19.60	8.06	2527.03	1.71	0.08	-116.69
	13:52:47	19.51	8.06	2514.78	1.68	0.07	-123.71
Last 5 Readings	13:54:46	19.35	8.06	2524.86	1.47	0.07	-127.73
	13:56:45	19.66	8.10	2494.98	1.35	0.06	-133.84
	13:58:44	19.73	8.11	2482.78	1.46	0.06	-135.33
		-0.16	0.00	10.08	-0.21	0.00	-4.02
Variance in Last 3 Readings		0.31	0.04	-29.88	-0.12	-0.01	-6.11
		0.07	0.01	-12.20	0.11	0.00	-1.49



win-Situme.		12/7/2017	ISI Low-Flow Log	
Project Information:		Pump Information:		
Operator Name	TJG	Pump Model/Type	SS Monsoon	
Company Name	Golder Associates	Tubing Type	LDPE	
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in	
Site Name	LTM	Tubing Length	108.15 ft	
		Pump Placement from TOC	102.15 ft	
Well Information:		Pumping Information:		
Well Id	CPA-MW-2D	Final Pumping Rate	300 mL/min	
Well Diameter	2 in	System Volume	793 mL	
Well Total Depth	104.61 ft	Calculated Sample Rate	158 sec	
Depth to Top of Screen	99.65 ft	Sample Rate	158 sec	
Screen Length	5 ft	Stabilized Drawdown	0.00 ft	
Depth to Water	15.44 ft			

# Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	8:52:11	16.94	6.99	1148.13	12.10	0.24	-88.41
	8:54:49	16.79	7.01	1170.71	8.73	0.21	-93.24
Last 5 Readings	8:57:27	16.71	6.98	1194.73	7.05	0.20	-93.68
	9:02:43	16.60	7.02	1208.39	4.84	0.19	-97.43
	9:05:21	16.13	7.02	1218.14	4.12	0.20	-97.08
		-0.08	-0.03	24.02	-1.68	-0.01	-0.44
Variance in Last 3 Readings		-0.11	0.04	13.66	-2.21	-0.01	-3.75
		-0.47	0.00	9.75	-0.72	0.01	0.35



win-Situme.		12/6/2017	ISI Low-Flow Log	
Project Information:		Pump Information:		
Operator Name	TJG	Pump Model/Type	SS Monsoon	
Company Name	Golder Associates	Tubing Type	LDPE	
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in	
Site Name	LTM	Tubing Length	116.50 ft	
		Pump Placement from TOC	110.50 ft	
Well Information:		Pumping Information:		
Well Id	CPA-MW-3D	Final Pumping Rate	300 mL/min	
Well Diameter	2 in	System Volume	840 mL	
Well Total Depth	112.72 ft	Calculated Sample Rate	167 sec	
Depth to Top of Screen	108.00 ft	Sample Rate	167 sec	
Screen Length	5 ft	Stabilized Drawdown	0.00 ft	
Depth to Water	18.01 ft			

# Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	11:36:02	17.30	7.09	1340.93	2.58	0.21	-103.78
	11:38:49	17.41	7.09	1317.73	2.87	0.17	-110.25
Last 5 Readings	11:41:36	17.43	7.09	1309.40	0.76	0.14	-113.74
	11:44:23	17.43	7.09	1310.28	0.87	0.12	-115.80
	11:47:10	17.48	7.09	1301.23	0.55	0.11	-117.01
		0.02	0.00	-8.33	-2.11	-0.03	-3.49
Variance in Last 3 Readings		0.00	0.00	0.88	0.11	-0.02	-2.06
		0.05	0.00	-9.05	-0.32	-0.01	-1.21



win-Situme.		12/5/2017	ISI Low-Flow Log	
Project Information:		Pump Information:		
Operator Name	TJG	Pump Model/Type	SS Monsoon	
Company Name	Golder Associates	Tubing Type	LDPE	
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in	
Site Name	LTM	Tubing Length	124.57 ft	
		Pump Placement from TOC	118.57 ft	
Well Information:		Pumping Information:		
Well Id	CPA-MW-4D	Final Pumping Rate	300 mL/min	
Well Diameter	2 in	System Volume	885 mL	
Well Total Depth	120.93 ft	Calculated Sample Rate	176 sec	
Depth to Top of Screen	116.07 ft	Sample Rate	176 sec	
Screen Length	5 ft	Stabilized Drawdown	0.00 ft	
Depth to Water	31.80 ft			

# Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	15:14:56	15.73	6.96	1924.67	2.80	0.24	-121.34
	15:17:52	15.96	6.94	1913.47	1.96	0.19	-125.59
Last 5 Readings	15:20:48	15.96	6.93	1912.24	1.95	0.16	-127.09
	15:23:47	16.00	6.92	1930.13	1.53	0.14	-128.26
	15:26:45	16.02	6.93	1918.24	1.22	0.13	-129.31
		0.00	-0.01	-1.23	-0.01	-0.03	-1.50
Variance in Last 3 Readings		0.04	-0.01	17.89	-0.42	-0.02	-1.17
		0.02	0.01	-11.89	-0.31	-0.01	-1.05



≪µn-situ inc.		12/5/2017	ISI Low-Flow Log
Project Information:		Pump Information:	
Operator Name	TJG	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	118.50 ft
		Pump Placement from TOC	112.25 ft
Well Information:		Pumping Information:	
Well Id	CPA-MW-5D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	849 mL
Well Total Depth	114.71 ft	Calculated Sample Rate	169 sec
Depth to Top of Screen	109.75 ft	Sample Rate	169 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	28.42 ft		

# Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	12:10:20	15.08	6.76	1926.60	12.4	0.16	-83.55
	12:13:10	15.28	6.75	1930.70	9.07	0.13	-86.13
Last 5 Readings	12:16:01	15.60	6.76	1928.77	7.04	0.12	-88.42
	12:18:53	15.63	6.76	1930.21	5.85	0.11	-89.50
	12:21:43	15.56	6.74	1931.98	4.97	0.11	-89.75
		0.32	0.01	-1.93	-2.03	-0.01	-2.29
Variance in Last 3 Readings		0.03	0.00	1.44	-1.19	-0.01	-1.08
		-0.07	-0.02	1.77	-0.88	0.00	-0.25



win-situme.		12/4/2017	ISI Low-Flow Log	
Project Information:		Pump Information:		
Operator Name	TJG	Pump Model/Type	SS Monsoon	
Company Name	Golder Associates	Tubing Type	LDPE	
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in	
Site Name	LTM	Tubing Length	121.78 ft	
		Pump Placement from TOC	116.16 ft	
Well Information:		Pumping Information:		
Well Id	ESL-MW-D1	Final Pumping Rate	300 mL/min	
Well Diameter	2 in	System Volume	869 mL	
Well Total Depth	119.24 ft	Calculated Sample Rate	173 sec	
Depth to Top of Screen	113.66 ft	Sample Rate	173 sec	
Screen Length	5 ft	Stabilized Drawdown	0.00 ft	
Depth to Water	26.46 ft			

# **Low-Flow Sampling Stabilization Summary**

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	13:55:25	17.46	6.87	1687.52	2.65	0.20	-69.06
	13:58:18	17.40	6.92	1712.80	1.18	0.18	-90.36
Last 5 Readings	14:01:11	17.41	6.95	1733.07	2.86	0.17	-101.36
	14:04:05	17.41	6.96	1749.72	1.74	0.16	-107.29
	14:06:58	17.36	6.97	1758.35	3.04	0.15	-110.68
		0.01	0.03	20.27	1.68	-0.01	-11.00
Variance in Last 3 Readings		0	0.01	16.65	-1.12	-0.01	-5.93
		-0.05	0.01	8.63	1.30	-0.01	-3.39



win-Situme.		12/5/2017	ISI Low-Flow Log	
Project Information:		Pump Information:		
Operator Name	TJG	Pump Model/Type	Peristaltic	
Company Name	Golder Associates	Tubing Type	LDPE	
Project Name	W.G. Krummrich	Tubing Diameter	0.17 in	
Site Name	LTM	Tubing Length	138.00 ft	
		Pump Placement from TOC	131.69 ft	
Well Information:		Pumping Information:		
Well Id	GWE-2D	Final Pumping Rate	150 mL/min	
Well Diameter	1 in	System Volume	706 mL	
Well Total Depth	136.62 ft	Calculated Sample Rate	282 sec	
Depth to Top of Screen	126.69 ft	Sample Rate	282 sec	
Screen Length	10 ft	Stabilized Drawdown	0.00 ft	
Depth to Water	30.35 ft			

# **Low-Flow Sampling Stabilization Summary**

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	10:41:40	14.43	6.81	3857.22	0.78	0.36	-85.97
	10:46:22	14.49	6.80	3859.22	0.31	0.30	-85.45
Last 5 Readings	10:51:04	14.65	6.80	3844.48	0.99	0.28	-85.77
	10:55:47	14.66	6.80	3853.75	1.51	0.26	-86.14
	11:00:29	14.57	6.80	3867.95	1.63	0.24	-86.28
		0.16	0.00	-14.74	0.68	-0.02	-0.32
Variance in Last 3 Readings		0.01	0.00	9.27	0.52	-0.02	-0.37
		-0.09	0.00	14.20	0.12	-0.02	-0.14

**Notes:** Peristaltic pump performing slower than usual due to low water levels.



	IIIC.	12/5/2017	ISI Low-Flow Log
Project Information:		Pump Information:	
Operator Name	TJG	Pump Model/Type	Peristaltic
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.17 in
Site Name	LTM	Tubing Length	116.00 ft
		Pump Placement from TOC	112.23 ft
Well Information:		Pumping Information:	
Well Id	GWE-3D	Final Pumping Rate	200 mL/min
Well Diameter	1 in	System Volume	608 mL
Well Total Depth	114.86 ft	Calculated Sample Rate	182 sec
Depth to Top of Screen	107.23 ft	Sample Rate	182 sec
Screen Length	10 ft	Stabilized Drawdown	0.00 ft
Depth to Water	28.27 ft		

Low-Flow System

#### **Low-Flow Sampling Stabilization Summary**

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	9:16:09	13.56	6.75	6049.08	0.88	0.36	-102.43
	9:19:11	13.69	6.76	6031.62	0.61	0.28	-104.91
Last 5 Readings	9:22:14	13.68	6.77	6017.11	0.98	0.26	-106.19
	9:25:16	13.88	6.78	6007.59	0.71	0.24	-107.42
	9:28:20	13.90	6.78	5976.36	0.50	0.23	-107.88
		-0.01	0.01	-14.51	0.37	-0.02	-1.28
Variance in Last 3 Readings		0.20	0.01	-9.52	-0.27	-0.02	-1.23
		0.02	0.00	-31.23	-0.21	-0.01	-0.46

**Notes:** Peristaltic pump performing slower than usual due to low water levels.



	mc.	12/4/2017	ISI Low-Flow Log
Project Information:		Pump Information:	
Operator Name	TJG	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.17 in
Site Name	LTM	Tubing Length	108.52 ft
		Pump Placement from TOC	102.52 ft
Well Information:		Pumping Information:	
Well Id	GWE-5D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	674 mL
Well Total Depth	105.12 ft	Calculated Sample Rate	134 sec
Depth to Top of Screen	100.02 ft	Sample Rate	134 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	18.40 ft		

Low-Flow System

#### Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	15:03:06	16.18	6.87	1712.74	22.6	0.22	-89.05
	15:05:20	16.09	6.87	1714.06	19.8	0.18	-92.50
Last 5 Readings	15:07:34	16.02	6.87	1716.40	14.1	0.16	-95.15
	15:09:48	16.08	6.89	1715.86	7.92	0.16	-99.09
	15:12:03	16.04	6.91	1720.21	4.97	0.14	-103.95
		-0.07	0.00	2.34	-5.70	-0.02	-2.65
Variance in Last 3 Readings		0.06	0.02	-0.54	-6.18	0.00	-3.94
		-0.04	0.02	4.35	-2.95	-0.02	-4.86

#### Notes:



	inc.	12/4/2017	ISI Low-Flow Log
Project Information:		Pump Information:	
Operator Name	TJG	Pump Model/Type	SS Monsoon
Company Name	Golder Associates	Tubing Type	LDPE
Project Name	W.G. Krummrich	Tubing Diameter	0.19 in
Site Name	LTM	Tubing Length	112.00 ft
		Pump Placement from TOC	103.29 ft
Well Information:		Pumping Information:	
Well Id	PM1D	Final Pumping Rate	300 mL/min
Well Diameter	2 in	System Volume	814 mL
Well Total Depth	106.61 ft	Calculated Sample Rate	162 sec
Depth to Top of Screen	100.79 ft	Sample Rate	162 sec
Screen Length	5 ft	Stabilized Drawdown	0.00 ft
Depth to Water	24.11 ft		

Low-Flow System

#### Low-Flow Sampling Stabilization Summary

	Time	Temp [C]	pH [pH]	Cond [µS/cm]	Turb [NTU]	RDO [mg/L]	ORP [mV]
Stabilization Settings			+/-0.2	+/-0.1	+/-1	+/-0.2	+/-20
Stabilization Settings				+/-3%	+/-10%	+/-10%	
	12:50:26	16.11	6.88	1479.53	3.44	0.18	-143.83
	12:53:08	16.21	6.91	1473.71	2.24	0.16	-143.26
Last 5 Readings	12:55:50	16.18	6.93	1476.16	2.04	0.14	-143.06
	12:58:32	16.18	6.94	1479.11	1.05	0.13	-142.83
	13:01:14	16.24	6.95	1476.42	0.85	0.12	-142.79
		-0.03	0.02	2.45	-0.20	-0.02	0.20
Variance in Last 3 Readings		0.00	0.01	2.95	-0.99	-0.01	0.23
		0.06	0.01	-2.69	-0.20	-0.01	0.04

#### Notes:

#### APPENDIX B CHAINS-OF-CUSTODY

(On CD)

		681-Atlanta	nta						681-Atlanta	lanta	THE LEADER IN ENVIRONMENTAL TESTING TestAmerica I shorefories Inc	ENTAL TESTIN
savannah, 58.31404 Phone: 912.354.785\$ Fax:	Regulatory Program:	::		NPDES	RCRA	Other:						TAL-8210 (0713)
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/ Name: Golder Associates	TellFax: 636-724-	124-9191		La.	Lab Contact:		Millele	CovCarrier:	T	red 6 x	10	cocs
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Preservation Used: 1= Ice. 2= HC; 3= H2SO4: 4=HNO3: 5=NaOH; 6= Other	=NaOH; 6= Other			-						-		
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please Commerts Section if the lab is to discose of the sample	Please List any EPA Waste Coo	te Cod	es for the sample in the	1	Sample D	isposal (	A fee m	ay be a	Sample Disposal ( A fee may be assessed if	samples are r	samples are retained longer than 1 month)	
Non-Hazard Flammable Skin fritant	Pason B	Unknawn	awn		Return	Return to Client		Dispe	Disposal by Lab	Archive for	ve for Months	
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🗌 Yes 🗐 No	Custody Seal No.:					Cooler Tu	Cooler Temp. (°C): Obs'd	): Obs'd		Corr'd:	Therm ID No.:	
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220339 TestAmerica Laboratories, Inc. TestAmerica Laboratories, Inc.	12/5/17 [COC No:	Fader 1	Sampler: AUF	For Lab Use Only:	Vvalk-In Client, Lab Sampling:	Job / SDG No.:		Sample Specific Notes:									680-146392 Chain of Custody				od K constant statistical franch	טמווידים הואסטמו (א ובפיווופל הפימטאטרט וו אמווידים מופירמוורט ווחוקפר נחמו דו וחסואה)	Lab Carchive For Months	) 2 · Q	Corrd: Therm ID No :	Company: Date/Time:	Company: Date/Time.	Company: Date/Time:
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681-A		-724-919	1 2 1	CALENDAR DAYS WORKING DAYS	TAT # different from Balow Spreak			Sample Sample (c=Comp. Date Time G=Crab) Ma	5		0011	ETT EN	0221		1350			7		145/17 1525 6	<b>"</b>	Please List any EPA Waste Codes for the s	Poison B Unknown		Custody Seal No.:	Company: Company: 124		Company: Dat
TestAmerica Savannah Sidz Lakoche Avenue Suite C-10 Sinte C-10	Client Contact	Company Name: Gilder Assessed	in SI #10	City/State/Zip: 54 Charles, NO 63341	Phone: 636-724-7(4) Fax:	Project Name: 4217 LTM 6 2 Smally - No 335	+ 42262863	Sample Identification	6406-30-1217	6WE-3D-F/0.2)-1217	6WE-2D-1217	6WE-2D-Floit>-1217	CPH-MW-5D-1217	20 PA- WW 5/6: 2 - 121- 20 - 5/612)-1217	B54-MW-5D-1217	854- MW-Flored -1217-50-Flored -1217	854-MW-57-1217-45	BSH- MW-50-1217-1150	4ary Trio Black #2	B.M- MW- 40-1217	1000 100	A Hazardous Waste? dispose of the sample.	Kon-Hazard	Special Instructions/QC Requirements & Comments:	Custody Seals Intact: Custody Seals Intact:	Relinquished by March	Relinquished by:	Relinquished by:

220337 TestAmerica	THE LEADER IN ENVIRONMENTAL TESTING TestAmerics & Aboratories, Inc.		COC No:	der 2 of 2 cocs	Sampler: AL	Por Lab Use Uniy: Walk-in Client:	Lab Sampling: Job / SDG No.:	Sample Specific Notes:									amples are retained longer than 1 month)	Carchive for Months		Corr'd: Therm ID No .:	any: Date/Time:	any: Date/Time: -	Par Date/Tiple: Date/Tiple:	
Chain of Custody Record 220	681-Atlanta	C other:	Swath Dilaro	ntact: Milbele Keedery Carrier: Fey	2		וציר גר קסור		3								Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)	Return to Client	O. JIS CCF-D. SIL.O	Coaler Temp. ("C): Obs'd:	Received by. Company:	Received by: Company.	Received in Laboratory Company.	
	681-Atlanta	rogram	And Deple	6.36-774-7171 Lab Contact:	Turnard	I from Below Shared Z	/ λ ) QSW (N / λ ) ald	1 day Sample Type (c=comp, # of \$0 \$0 (c=comp, Matrix Cont. [[] @ protection (a=certection)	- 6 10 4							36	te Codes for the sample in the	Unknown	6		Date/Time'	and some of the local division of the local	Date/Time: Rece	5
n 680-146.		Regulatory Program:	Project Mar	S Tel/Fax:		C33 ¢ 1 LVCALENDAR DAYS	Sumplier trast	Sample Sample Date Time								H2SO4; 4=HNO3; 5=NaOH; 6= Othe	ious Waste? Please List any EPA Waste	Skin Irritant 🗌 Poison B	& Comments:	Custody Seal No.		Company.	Company	
TestAmerica Savaman 680-146392	Suite C-10 Suite C-10	Savannan, 68 31404 Phone: 912.354.7858 Far:	Client Cont	bolder	5 Ruis	City/State/Zip: 54 (1-16) 100 Phone: 636-727-9141	CTM 6W	Sample Identification	85A-MW-40-F/0.2)-12		Pe	age 4	5 of	54		Preservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other	Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Comments Section if the lab is to dispose of the sample.	Vion-Hazard	Special Instructions/QC Requirements & Comments:	Custody Seals Intact:	Religenstred by Annul	Relinquished by	Relinquished by:	

<b>TestAmerica Savannah</b> 5102 LaRoche Avenue		Che	in o	Chain of Custody Record	ody R	leco	P			<b>TestAmerica</b>
Savannah, GA 31404 phone 912.354.7858 fax	Regulatory Program:	MO	[]NPDES	CRCRA	Other:				Tes	TestAmerica Laboratories, Inc.
Client Contact	Project Manager: Aman	Amanda Derhake	Sil	Site Contact: Samantha DiCenso	Samanthi	a DiCen	so Date:	te:	COC No:	
Golder Associates Inc.	Tel/Fax: 636-724-9191		La	Lab Contact: Michele Kersey	Michele K	ersey	Ca	Carrier: FedEx	7	of <b>2</b> COCs
820 South Main Street	Analysis Turna	Turnaround Time			þ.ð				Sampler	
St. Charles, MO 63301	CALENDAR DAYS	WORKING DAYS		(	-				ForL	For Lab Use Only:
(636) 724-9191 Phone	TAT if different from	int from Below Standard	(	N /			00		Walk-	Walk-in Client
(636) 724-9323 FAX	2 weeks	S	N /	_			109		Lab S	Lab Sampling:
Project Name: 4Q17 LTM GW Sampling-1403345			¥)		15/2		γy			
Site; Solutia WG Krummrich Plant P O # 42562863	2 days		alqm	09	325	2 83			/ qor	Job / SDG No.:
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Custody Seals Intact:   . Yes  . No	Custody Seal No.:				Cooler Temp.		("C), Obs'd	Corrd:	Therr	Iherm ID No.
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017			)	1				Form	Form No. CA-C-WI-D02, Rev.	002, Rev. 4.3, dated 12/05/2013
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TestAmerica The Leader In Environmental Testing	COC No:	Z of Z COCs	Sampler: JAP	For Lab Use Unly: Walk-in Client:	Lab Sampling:	Job / SDG No.:		Sample Specific Notes:							and the state of the set of the s	ained longer than 1 month)	or Months	3.5	Therm ID No.:	Date/Time:	Date/Time;	Date/Time: 1217417-0755	Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013	1 2 3 4 5 6
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<b>TestAmerica Savannah</b> $O SO - IUQ UA$	Client Contact	Golder Associates Inc. Te		St. Charles, MO 63301 (636) 724-9191 (636) 724-9191	(636) 724-9323 FAX	Project Name: 40,17,4,17% GW Santping-1405345 Site: Solutia WG Krummrich Plant	P O # 42262863	S Sample Identification	4217 Trip Bhik #3			of 5		5	C Preservation Used: 1= ice, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other	Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Comments Section if the lab is to dispose of the sample.	Won-Hazard Flammable USkin trritant	Comments: VOC headspace upon sampling: Yes/No	Custody Seals Intact_ D Yes D No	Mand 16	Relinquishey	Relinquished by.		

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Special Instructions/GC Requirements & Comments:         VOC headspace upon sampling: Yes/No         Custody Seals Intact:       Yes       No         Custody Seals Intact:       Yes       No         Custody Seals Intact:       Yes       Cooler Temp. (*). Obs/d       Conf         Relinquished by:       Company:       Istantime:       Received by:       Company:         Relinquished by:       Company:       Date/Time:       Received by:       Company:         Relinquished by:       No       Date/Time:       Received by:       Company:         No       No       No       No       No	Cinon-Hazard	Polson B	Unknov	UN		Return	to Client	2	Disposal by			
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#### APPENDIX C QUALITY ASSURANCE REPORT

(On CD)



# QUALITY ASSURANCE REPORT

4<sup>th</sup> QUARTER 2017 LONG-TERM MONITORING PROGRAM SOLUTIA INC. W.G. KRUMMRICH FACILITY SAUGET, ILLINOIS

Prepared For: Solutia Inc. 575 Maryville Centre Drive St. Louis, MO 63141 USA

Submitted By: Golder Associates Inc. 820 S. Main Street, Suite 100 St. Charles, MO 63301 USA

February 2018

140-3345



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A world of capabilities delivered locally



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#### 1.0 INTRODUCTION

Golder Associates Inc. (Golder) completed a review of analytical data for the groundwater samples collected December 4 through December 7, 2017 at the Solutia Inc. (Solutia) W.G. Krummrich (WGK) Plant (Site) in Sauget, Illinois. Golder collected a total of twenty one (21) samples from groundwater monitoring wells and piezometers as part of the 4<sup>th</sup> Quarter 2017 (4Q17) Long-Term Monitoring Program (LTMP). Fifteen (15) groundwater samples, four (4) trip blanks, two (2) equipment blanks (EB), two (2) analytical duplicates (AD), and one (1) matrix spike/matrix spike duplicate (MS/MSD) pair were prepared. Groundwater monitoring locations were located at the WGK facility or approximately 1.0 to 1.5 miles north of the Site. The samples were submitted to the TestAmerica Laboratories, Inc. (TestAmerica) facility located in Savannah, Georgia for analysis using United States Environmental Protection Agency (USEPA) methods, standard methods and USEPA SW-846 test methods. Samples submitted to TestAmerica were analyzed for volatile organic compounds (VOCs), total and dissolved metals, dissolved gases, and general chemistry parameters. The analytical results were placed into four (4) sample delivery groups (SDGs) and described in the table below:

Sample Delivery Group (SDG)	Sample Identification
	PM1D-1217
KPS205	ESL-MW-D1-1217
KPS205 KPS206	GWE-5D-1217
	4Q17 LTM Trip Blank #1
	GWE-2D-1217
	GWE-3D-1217
KPS206	BSA-MW-5D-1217
	CPA-MW-4D-1217
	CPA-MW-5D-1217
	4Q17 LTM Trip Blank #2
	BSA-MW-4D-1217
	BSA-MW-3D-1217
	BSA-MW-3D-1217-EB
KPS200	BSA-MW-2D-1217
	CPA-MW-3D-1217
	CPA-MW-3D-1217-AD
	CPA-MW-1D-1217
	4Q17 LTM Trip Blank #3
	CPA-MW-2D-1217
	CPA-MW-2D-1217-AD
KPS201	BSA-MW-1S-1217
	BSA-MW-1S-1217-EB
	4Q17 LTM Trip Blank #4





The samples were collected and analyzed in general accordance with the Revised Long-Term Monitoring Program (LTMP) Work Plan (Work Plan) (Solutia 2009). Groundwater samples were analyzed for VOCs, total and dissolved metals, dissolved gases, and general chemistry parameters. The general chemistry parameters included chloride, nitrate, sulfate, total organic carbon (TOC), alkalinity, carbon dioxide, and dissolved organic carbon (DOC). Four (4) trip blanks, two (2) EBs, two (2) ADs, and one (1) MS/MSD pairs were submitted and analyzed for VOC analysis. The following analytical methods used are from USEPA document SW-846, <u>Test Methods for Evaluating Solid Waste</u>, Revision 6 contained in Final Update III August 2002 and listed below:

- VOCs were analyzed using <u>USEPA SW-846 Method 8260B Volatile Organic Compounds</u> by Gas Chromatography/Mass Spectrometry (GC/MS)
- Total and Dissolved Iron and Manganese were analyzed by <u>USEPA SW-846 Method</u> 6010C Inductively Coupled Plasma-Atomic Emission Spectrometry

The following standard methods were used to analyze monitored natural attenuation (MNA) parameters:

- Dissolved Gases analyzed by <u>Method RSK-175</u>
- Alkalinity <u>USEPA Method 310.1 and Method SM 2320B</u>
- Free Carbon Dioxide analyzed by <u>Method SM 4500 CO2C</u>
- Chloride analyzed by <u>USEPA Method 325.2 by Automated Colorimetry</u>
- Nitrogen, Nitrate analyzed by <u>USEPA Method 353.2 by Automated Colorimetry</u>
- Sulfate analyzed by USEPA Method 375.4 by Spectrophotometer
- Total and Dissolved Organic Carbon analyzed by USEPA Method 415.1

Golder completed validation of the analytical data following the general guidelines in Section 4.4 Data Review and Validation of the Work Plan. The most recent versions of the national data validation guidelines were used for data review. The following guidelines were generally used:

- USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review, EPA-540-R-2017-002, January 2017
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Methods Data Review, EPA 540-R-2017-001, January 2017

These documents are hereafter referred to as the "functional guidelines". If there was a conflict between the functional guidelines and the quality control criteria specified in the analytical method, the method-specific criteria were used. The SDGs were prepared as a Level IV data report package containing quality control information and raw data. Golder completed Level III review of 100% of the analytical data and Level IV review of 10% of the analytical data.

Data that has been qualified by the data validator has been added to the laboratory report. The qualifiers indicate data that did not meet acceptance criteria and corrective actions were not successful or not performed. Laboratory data qualifiers are defined below:



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- U The analyte was analyzed for but not was not detected
- J The analyte was detected and the result is less than the reporting limit (RL) but greater than or equal to the method detection limit (MDL) and the concentration is an approximate value

Golder data qualifiers are defined below:

- D The analyte was analyzed at a dilution
- J The analyte was detected and the result is considered an estimated value
- UJ Samples were analyzed outside of hold time; analyte was not detected

Sections 2 and 3 summarize the specific instances where quality control criteria in the functional guidelines were not met. As specified in the functional guidelines, if the non-adherence to quality control criteria is slight, professional judgment was used in qualification of the data. However, if the non-adherence is significant, qualification and rejection of the data may be necessary. A summary of qualified data is provided in Section 5.0.

#### 2.0 VOLATILE ORGANIC COMPOUNDS

Samples were collected from fifteen (15) groundwater monitoring locations and analyzed for VOCs. Analytical duplicate samples were collected from two (2) sampling locations, CPA-MW-2D and CPA-MW-3D. Two (2) EBs and four (4) trip blanks were also prepared and shipped for laboratory analysis. The samples were submitted to TestAmerica, placed into four (4) data packages or SDGs (KPS205, KPS206, KPS200, and KPS201) and were prepared and analyzed using SW-846 Method 8260B. Samples were validated in general accordance with the functional guidelines. Results of the validation are summarized below.

#### 2.1 Receipt Condition and Sample Holding Times

The SDG Case Narrative, chain-of-custody, login sample receipt checklist, and analysis dates were reviewed to verify analytical method holding times and proper preservation upon sampling. The samples were received in good condition and data qualification was not required.

#### 2.2 Blanks

Laboratory and field blanks, including trip blanks, method blanks and equipment blanks are prepared and analyzed to determine if contamination occurred as a result of laboratory or field activities.

Four (4) laboratory prepared trip blanks were shipped and analyzed for VOCs during the 4Q17 event to evaluate whether cross contamination occurred during sample shipment. Results for contaminants of concern for the received trip blanks were non-detect.



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Laboratory method blanks were performed for each laboratory system as outlined for each analytical method to evaluate whether cross contamination occurred during laboratory analysis activities. Results for the method blanks were non-detect.

Two (2) EBs were collected during the 4Q17 event to assess the effectiveness of the decontamination procedure. Detections were noted in the following EBs:

- BSA-MW-1S-1217-EB (SDG KPS201): benzene at 39 µg/L and chlorobenzene at 1.0 µg/L
- BSA-MW-3D-1217-EB (SDG KPS200): chlorobenzene at 2.5 µg/L

The samples associated with the EBs did not require qualification as the analytes in the associated samples were either not detected, or detected at concentrations significantly greater than the EB detections.

#### 2.3 Surrogate Spike Recoveries

Samples to be analyzed for VOCs were spiked with surrogate compounds: 4-bromofluorobenzene, 1,2-dichloroethane-d4, dibromofluoromethane, and toluene-d8, prior to analysis, to evaluate overall laboratory performance. Surrogate recoveries were within control limits.

#### 2.4 Laboratory Control Sample Recoveries

A laboratory control sample (LCS) is analyzed on each laboratory system to evaluate the analytical method accuracy and laboratory performance. LCS recoveries were within acceptance criteria; therefore, data qualification was not required.

#### 2.5 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

MS/MSD samples are analyzed to determine long term precision and accuracy of the analytical method on various matrices. One (1) MS/MSD pair is sampled for every twenty (20) field samples. One (1) MS/MSD pair was collected during the 4Q17 event associated with sample BSA-MW-5D. MS/MSD accuracy and precision data met criteria; therefore, qualification was not required.

#### 2.6 Analytical Duplicates

One (1) AD is collected for every ten (10) field samples to determine the overall precision of field and laboratory methods. Two (2) ADs were collected during the 4Q17 event associated with samples CPA-MW-2D and CPA-MW-3D. The relative percent difference (RPD) between the samples and the associated ADs did not exceed 25%; therefore, data qualification was not required.



#### 2.7 Internal Standard Responses

Internal standard performance criteria ensure that GC/MS sensitivity and response are stable during each analysis. Internal standard area counts did not vary by more than a factor of two (2) from the associated 12 hour calibration standard. Internal standard retention times did not vary more than +/-30 seconds from the retention time of the associated 12 hour calibration standard. Data qualification was not required.

#### 2.8 Results Reported From Dilutions

Several VOC samples required dilutions due to high levels of target analytes. Reporting limits were adjusted to reflect the dilution. Result qualifications are shown in Section 4.0.

#### 3.0 INORGANICS AND GENERAL CHEMISTRY

Samples were collected from fifteen (15) groundwater monitoring locations and analyzed for inorganics and general chemistry. The samples were submitted to TestAmerica, placed into four (4) data packages or SDGs (KPS205, KPS206, KPS200, and KPS201), and were prepared and analyzed using the following methods:

- Total and Dissolved Iron and Manganese analyzed by <u>Method 6010C Inductively</u> <u>Coupled Plasma-Atomic Emission Spectrometry</u>
- Dissolved Gases analyzed by Method RSK-175
- Alkalinity USEPA Method 310.1 and Method SM 2320B
- Free Carbon Dioxide analyzed by <u>Method SM 4500 CO2C</u>
- Chloride analyzed by <u>USEPA Method 325.2 by Automated Colorimetry</u>
- Nitrogen, Nitrate analyzed by <u>USEPA Method 353.2 by Automated Colorimetry</u>
- Sulfate analyzed by <u>USEPA Method 375.4 by Spectrophotometer</u>
- Total and Dissolved Organic Carbon analyzed by <u>USEPA Method 415.1</u>

Samples were validated in general accordance with the functional guidelines. Results of the validation are summarized below.

#### 3.1 Receipt Condition and Sample Holding Times

The SDG Case Narrative, chain-of-custody, login sample receipt checklist, and analysis dates were reviewed to verify analytical method holding times and proper preservation upon sampling. A summary of affected SDGs is provided below.

Samples in KPS205, KPS206, KPS200, and KPS201 were received or analyzed outside of hold times. Significant headspace was present in samples CPA-MW-2D and BSA-MW-1S sample containers. Result qualifications are shown in Section 4.0.





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#### 3.2 Blanks

Laboratory method blanks are prepared and analyzed to determine if contamination occurred as a result of laboratory activities.

Laboratory method blanks were performed for each laboratory system as outlined for each analytical method to evaluate whether cross contamination occurred during laboratory analysis activities. Results for the method blanks were non-detect.

#### 3.3 Laboratory Control Sample Recoveries

A LCS is analyzed on each laboratory system to evaluate the analytical method accuracy and laboratory performance. LCS recoveries were within acceptance criteria; therefore, data qualification was not required.

#### 3.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

MS/MSD samples are analyzed to determine long term precision and accuracy of the analytical method on various matrices. Although MS/MSD analysis was not required for inorganic and general chemistry per the Work Plan, the laboratory spiked groundwater samples PM1D, GWE-2D, BSA-MW-1S, BSA-MW-4D, and BSA-MW-5D, for various analytes. Some MS/MSD data for these samples was outside acceptance criteria. Result qualifications are shown in Section 4.0.

#### 3.5 Results Reported From Dilutions

Samples in each SDG required dilutions due to high levels of target analytes. Reporting limits were adjusted to reflect the dilution. Result qualifications are shown in Section 4.0.

#### 4.0 SUMMARY

Golder validated the data collected during the 4Q17 sampling event from the Solutia Inc. WGK facility in general accordance with the Work Plan and USEPA functional guidelines. Although some data required qualifications due to quality control criteria that were not achieved, the data were deemed usable. Where a positive result was qualified as estimated, the analyte should be considered present. Similarly, a result that was qualified as an estimated reporting limit should be considered not present for the purposes of this program, although the limit itself may not be precise. The completeness for the entire data set was 100%.





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#### **Qualification Summary Table**

Quality Control Issue	Compound(s)	Qualifier	Samples Affected
Compounds analyzed at a dilution	Benzene, Chlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Chloride, Sulfate	D	PM1D, ESL-MW-D1, GWE-2D, GWE-3D, GWE-5D, BSA-MW-1S, BSA-MW-2D, BSA-MW-3D, BSA-MW-4D, BSA-MW-5D, CPA-MW-1D, CPA-MW-2D, CPA-MW-2D-AD, CPA-MW-3D, CPA-MW-3D-AD, CPA-MW-4D, CPA-MW-5D
CCAL %D outside QC limits	Methane	J	BSA-MW-1S, CPA-MW-2D
Analyzed outside of hold time	Alkalinity, Carbon Dioxide, Free	J	GWE-2D, GWE-3D, GWE-5D, BSA-MW-1S, BSA-MW-2D, BSA-MW-3D, BSA-MW-5D, CPA-MW-1D, CPA-MW-2D, CPA-MW-3D, CPA-MW-4D, CPA-MW-5D
Analyzed outside of hold time; compound not detected	Nitrate	IJ	PM1D, ESL-MW-D1, GWE-2D, GWE-3D, GWE-5D, BSA-MW-1S, BSA-MW-3D, BSA-MW-4D, BSA-MW-5D, CPA-MW-4D, CPA-MW-5D





#### 5.0 **REFERENCES**

- Solutia Inc., 2009. Revised Long Term Monitoring Program Work Plan, Solutia Inc., W.G. Krummrich Facility, Sauget, Illinois, May 2009.
- USEPA, 2017. Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Methods Data Review.
- USEPA, 2017. Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review.



#### APPENDIX D GROUNDWATER ANALYTICAL RESULTS (INCLUDING DATA VALIDATION REPORTS)

(On CD)



#### Level IV Data Validation Summary Solutia Inc., W.G. Krummrich, Sauget, Illinois 4Q17 Long-Term Monitoring Program

Company Name: <u>Golder Associates</u> Project Name: <u>WGK-4Q17 LTM</u> Reviewer: <u>S. DiCenso</u> Laboratory: <u>TestAmerica</u> SDG#: <u>KPS205</u> Matrix: Water Project Manager: <u>A. Derhake</u> Project Number: <u>140-3345</u> Sample Date: <u>December 2017</u>

Analytical Method: VOC (8260B), Dissolved Gases (RSK-175), Metals (6010C), Alkalinity (SM 2320B), Carbon Dioxide (SM 4500 CO2C), Chloride (325.2), Nitrogen, Nitrate-Nitrite (353.2), Sulfate (375.4), TOC (415.1), and DOC (415.1)

Sample Names: PM1D-1217, PM1D-F(0.2)-1217, ESL-MW-D1-1217, ESL-MW-D1-F(0.2)-1217, GWE-5D-1217, GWE-5D-F(0.2)-1217, 4Q17 LTM Trip Blank #1

Field Information		YES	NO	NA
a)	Sampling dates noted?	$\boxtimes$		
b)	Does the laboratory narrative indicate deficiencies?	$\boxtimes$		

#### Comments:

VOC: Insufficient sample volume to perform MS/MSD associated with batches 505810 and 505815.

Sample ESL-MW-D1 required dilution prior to analysis, reporting limits were adjusted accordingly.

Dissolved Gases: No deficiencies noted.

Metals: No deficiencies noted.

Alkalinity: No deficiencies noted.

Chloride: Samples PM1D, ESL-MW-D1	, and GWE-5D required dilution	prior to analysis	s, reporting limits w	vere adjusted accordingly.

*Nitrate-Nitrite as Nitrogen:* Due to instrument failure, samples PM1D, ESL-MW-D1, and GWE-5D sent to an alternate lab and analyzed outside hold time.

Nitrate exceeded the recovery criteria for the MS and MSD for analytical batch 55640. Sample matrix interference is suspected because associated LCS met acceptance criteria.

Sulfate: Samples PM1D, ESL-MW-D1, and GWE-5D required dilution prior to analysis, reporting limits were adjusted accordingly.

TOC: No deficiencies noted.

DOC: No deficiencies noted.

Free Carbon Dioxide: No deficiencies noted.

#### Chain-of-Custody (COC)

- a) Was the COC signed by both field and laboratory personnel?
- b) Were samples received in good condition?

**Comments:** <u>Samples were received at 2.0°C, within the 0°C to 6°C criteria.</u>



YES NO NA

 $\square$ 

 $\boxtimes$ 

 $\boxtimes$ 

	February 2018	2	140-3345
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General		YES	NO	NA
a)	Were hold times met for sample analysis?		$\boxtimes$	
b)	Were the correct preservatives used?	$\boxtimes$		
c)	Was the correct method used?		$\boxtimes$	
d)	Any sample dilutions noted?	$\boxtimes$		

**Comments:** Due to instrument failure, samples were sent to an alternate lab and were analyzed under a different method for alkalinity (SM 2320B) and free carbon dioxide (SM 4500 CO2C). The instrument failure and sample re-shipment resulted in alkalinity, carbon dioxide, and nitrate analyzed outside of hold time.

Detections in diluted analysis were qualified.

GC/N	IS Instrument Performance Check (IPC) and Internal Standards (IS)	YES	NO	NA
a)	IPC analyzed at the appropriate frequency and met the appropriate standards?	$\bowtie$		
b)	Does BFB/DFTPP meet the ion abundance criteria?	$\boxtimes$		
c)	Internal Standard retention times and areas met appropriate criteria?	$\bowtie$		
Co	mments: None.			
Calib	prations	YES	NO	NA
a)	Initial calibration analyzed at the appropriate frequency and met the appropriate standards?	$\boxtimes$		
b)	Continuing calibrations analyzed at the appropriate frequency and met the appropriate standards	s?		
		$\boxtimes$		
c)	Initial calibration verifications and blanks analyzed at the appropriate frequency and met the app	ropriate	stand	ards?
			$\boxtimes$	
d)	Continuing calibration verifications and blanks analyzed at the appropriate frequency and met the	e approj	oriate	standards?
0				
	pmments: Some compounds did not meet calibration requirements; however, calibration criteria was data qualification was required.	ere met	by an	arytes of interest.
Blan	ks	YES	NO	NA
a)	Were blanks (trip, equipment, method) performed at required frequency?	$\boxtimes$		
b)	Were analytes detected in any blanks?		$\boxtimes$	
Co	omments: None.			
Matri	ix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA
a)	Was MS/MSD accuracy criteria met?		$\boxtimes$	
b)	Was MS/MSD precision criteria met?	$\boxtimes$		
	mments: Nitrogen exceeded the recovery criteria low for MS of sample PM1D associated with bac cordingly.	tch 5564	<u>40. Da</u>	ata was qualified
Labo	pratory Control Sample (LCS)	YES	NO	NA
a)	LCS analyzed at the appropriate frequency and met appropriate standards?	$\boxtimes$		
Co	omments: None.			



		February 2018	3			140-3345
Surrogate (System Monitoring) Compounds					NO	NA
a) Surrogate compounds analyzed at the appropriate frequency and met appropriate standards?						

Con	nments: <u>None.</u>			
Dupli	cates	YES	NO	NA
a)	Were field duplicates collected?			$\boxtimes$
b)	Was field duplicate precision criteria met?			$\boxtimes$

Comments: None.

#### Additional Comments: None.

#### **Qualifications:**

Quality Control Issue	Compound(s)	Qualifier	Samples Affected
Compounds analyzed at a dilution	Chlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, Chloride, and Sulfate	D	PM1D, ESL-MW-D1, GWE-5D
Analyzed outside of hold time	Alkalinity and Carbon Dioxide, Free	J	GWE-5D
Analyzed outside of hold time; compound not detected	Nitrate	IJ	PM1D, ESL-MW-D1, GWE-5D



SDG KPS205

Sample Results from:

PM1D ESL-MW-D1 GWE-5D

# <u>TestAmerica</u>

THE LEADER IN ENVIRONMENTAL TESTING

## **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc. TestAmerica Savannah 5102 LaRoche Avenue Savannah, GA 31404 Tel: (912)354-7858

TestAmerica Job ID: 680-146390-1 TestAmerica Sample Delivery Group: KPS205 Client Project/Site: 4Q17 LTM GW Sampling - 1403345 Revision: 1

For: Solutia Inc. 575 Maryville Centre Dr. Saint Louis, Missouri 63141

Attn: Mr. Jerry Rinaldi

Michele R.Knsy

..... LINKS

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Authorized for release by: 2/20/2018 3:57:46 PM Michele Kersey, Project Manager II (912)354-7858 michele.kersey@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

550 2/13/18

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Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

#### TestAmerica Job ID: 680-146390-1 SDG: KPS205

#### Job ID: 680-146390-1

#### Laboratory: TestAmerica Savannah

Narrative

#### CASE NARRATIVE

#### **Client: Solutia Inc.**

#### Project: 4Q17 LTM GW Sampling - 1403345

#### Report Number: 680-146390-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

#### RECEIPT

The samples were received on 12/06/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.0 C.

Report revised 02/20/18 to correct SDG to KPS205.

#### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples PM1D-1217 (680-146390-1), ESL-MW-D1-1217 (680-146390-3), GWE-5D-1217 (680-146390-5) and 4Q17Trip Blank #1 (680-146390-7) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 12/10/2017 and 12/11/2017.

Sample ESL-MW-D1-1217 (680-146390-3)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batches 680-505810, and 680-505815.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **DISSOLVED GASES**

Samples PM1D-1217 (680-146390-1), ESL-MW-D1-1217 (680-146390-3) and GWE-5D-1217 (680-146390-5) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 12/07/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### METALS (ICP) - DISSOLVED

Samples PM1D-F(0.2)-1217 (680-146390-2), ESL-MW-D1-F(0.2)-1217 (680-146390-4) and GWE-5D-F(0.2)-1217 (680-146390-6) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 12/07/2017 and analyzed on 12/12/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### METALS (ICP)

Samples PM1D-1217 (680-146390-1), ESL-MW-D1-1217 (680-146390-3) and GWE-5D-1217 (680-146390-5) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 12/07/2017 and analyzed on 12/12/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

55D 2/13/18

5 6

TestAmerica Savannah

#### Job ID: 680-146390-1 (Continued)

#### Laboratory: TestAmerica Savannah (Continued)

#### **ALKALINITY**

Sample GWE-5D-1217 (680-146390-5) was analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 12/26/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### ALKALINITY

Samples PM1D-1217 (680-146390-1) and ESL-MW-D1-1217 (680-146390-3) were analyzed for alkalinity in accordance with EPA Method 310.1. The samples were analyzed on 12/14/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **CHLORIDE**

Samples PM1D-1217 (680-146390-1), ESL-MW-D1-1217 (680-146390-3) and GWE-5D-1217 (680-146390-5) were analyzed for Chloride in accordance with EPA Method 325.2. The samples were analyzed on 12/12/2017.

Samples PM1D-1217 (680-146390-1)[2X], ESL-MW-D1-1217 (680-146390-3)[2X] and GWE-5D-1217 (680-146390-5)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### NITRATE-NITRITE AS NITROGEN

Samples PM1D-1217 (680-146390-1), ESL-MW-D1-1217 (680-146390-3) and GWE-5D-1217 (680-146390-5) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 12/07/2017.

The following samples were analyzed one day outside of analytical holding time due to an Instrument failure: PM1D-1217 (680-146390-1), ESL-MW-D1-1217 (680-146390-3) and GWE-5D-1217 (680-146390-5).

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 680-505640 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### SULFATE

Samples PM1D-1217 (680-146390-1), ESL-MW-D1-1217 (680-146390-3) and GWE-5D-1217 (680-146390-5) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 12/13/2017.

Samples PM1D-1217 (680-146390-1)[20X], ESL-MW-D1-1217 (680-146390-3)[20X] and GWE-5D-1217 (680-146390-5)[50X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### TOTAL ORGANIC CARBON

Samples PM1D-1217 (680-146390-1), ESL-MW-D1-1217 (680-146390-3) and GWE-5D-1217 (680-146390-5) were analyzed for total organic carbon in accordance with EPA Method 415.1. The samples were analyzed on 12/12/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **DISSOLVED ORGANIC CARBON (DOC)**

Samples PM1D-F(0.2)-1217 (680-146390-2), ESL-MW-D1-F(0.2)-1217 (680-146390-4) and GWE-5D-F(0.2)-1217 (680-146390-6) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 12/13/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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#### Job ID: 680-146390-1 (Continued)

#### Laboratory: TestAmerica Savannah (Continued)

#### FREE CARBON DIOXIDE

Sample GWE-5D-1217 (680-146390-5) was analyzed for free carbon dioxide in accordance with SM 4500 CO2 C. The samples were analyzed on 12/26/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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TestAmerica Savannah

## Sample Summary

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345 TestAmerica Job ID: 680-146390-1 SDG: KPS205

PM1D-1217	Water	10/04/17 10:00	10100110 00 00
		12/04/17 13:00	12/06/17 09:20
PM1D-F(0.2)-1217	Water	12/04/17 13:00	12/06/17 09:20
SL-MW-D1-1217	Water	12/04/17 14:05	12/06/17 09:20
SL-MW-D1-F(0.2)-1217	Water	12/04/17 14:05	12/06/17 09:20
GWE-5D-1217	Water	12/04/17 15:15	12/06/17 09:20
GWE-5D-F(0.2)-1217	Water	12/04/17 15:15	12/06/17 09:20
Q17Trip Blank #1	Water	12/04/17 00:00	12/06/17 09:20
	SL-MW-D1-F(0.2)-1217 GWE-5D-1217 GWE-5D-F(0.2)-1217	SSL-MW-D1-F(0.2)-1217         Water           GWE-5D-1217         Water           GWE-5D-F(0.2)-1217         Water	Water         12/04/17         14:05           WE-5D-1217         Water         12/04/17         15:15           WE-5D-F(0.2)-1217         Water         12/04/17         15:15

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#### **Method Summary**

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146390-1 SDG: KPS205

lethod	Method Description	Protocol	Laboratory
3260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
RSK-175	Dissolved Gases (GC)	RSK	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
310.1-1978	Alkalinity	MCAWW	TAL SAV
325.2-1978	Chloride	MCAWW	TAL SAV
353.2-1993 R2.0	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAV
375.4-1978	Sulfate	MCAWW	TAL SAV
15.1-1974	TOC	MCAWW	TAL SAV
15.1-1974	DOC	MCAWW	TAL SAV
SM 2320B	Alkalinity	SM	TAL CF
SM 4500 CO2 C	Free Carbon Dioxide	SM	TAL CF

#### **Protocol References:**

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401 TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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## **Definitions/Glossary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

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#### Qualifiers

GC/MS VOA	
Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
GC VOA	
Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
Metals	
Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
General Che	mistry
Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
н	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

HF Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

#### Glossary

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### **Detection Summary**

TestAmerica Job ID: 680-146390-1 SDG: KPS205

Lab Sample ID: 680-146390-1

Lab Sample ID: 680-146390-2

Lab Sample ID: 680-146390-3

#### Client Sample ID: PM1D-1217

Analyte	Result Qualifie	er RL	MDL U	nit	Dil Fac	D	Method	Prep Type
Chlorobenzene	37	1.0	ug	g/L	1	_	8260B	Total/NA
Methane	68	0.58	ug	g/L	1		RSK-175	Total/NA
Iron	14	0.050	m	g/L	1		6010C	Total
Manganese	0.51	0.010	m	g/L	1		6010C	Recoverable Total Recoverable
Chloride	77 🏹	2.0	m	g/L	2		325.2-1978	Total/NA
Sulfate	280 🏹	100	m	g/L	20		375.4-1978	Total/NA
Total Organic Carbon	2.5	1.0	m	g/L	1		415.1-1974	Total/NA
Analyte	Result Qualifie	er RL	RL U	nit	Dil Fac	D	Method	Ргер Туре
Alkalinity	210	5.0	m	g/L	<u> </u>	_	310.1-1978	Total/NA
Carbon Dioxide, Free	3400	5.0	m	g/L	1		310.1-1978	Total/NA

#### Client Sample ID: PM1D-F(0.2)-1217

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac	Method	Ргер Туре
Iron, Dissolved	15	0.050	mg/L	1	6010C	Dissolved
Manganese, Dissolved	0.53	0.010	mg/L	1	6010C	Dissolved
Dissolved Organic Carbon	2.7	1.0	mg/L	1	415.1-1974	Dissolved

#### Client Sample ID: ESL-MW-D1-1217

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	140	$\mathcal{P}$	2.0		ug/L	2	_	8260B	Total/NA
1,2-Dichlorobenzene	2.2	P	2.0		ug/L	2		8260B	Total/NA
1,4-Dichlorobenzene	19	D	2.0		ug/L	2		8260B	Total/NA
Methane	52		0.58		ug/L	1		RSK-175	Total/NA
Iron	12		0.050		mg/L	1		6010C	Total
Manganese	0.38	_	0.010		mg/L	1		6010C	Recoverable Total Recoverable
Chloride	93	$\mathcal{P}$	2.0		mg/L	2		325.2-1978	Total/NA
Sulfate	490	$\nabla$	100		mg/L	20		375.4-1978	Total/NA
Total Organic Carbon	2.9		1.0		mg/L	1		415.1-1974	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Ргер Туре
Alkalinity	270		5.0		mg/L	1	_	310.1-1978	Total/NA
Carbon Dioxide, Free	350		5.0		mg/L	1		310.1-1978	Total/NA

#### Client Sample ID: ESL-MW-D1-F(0.2)-1217

	Lab Sample ID: 680-146390	-4
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Lab Sample ID: 680-146390-5

Analyte	Result	Qualifier	RL	MDL U	Jnit	Dil Fac	D	Method	Ргер Туре
Iron, Dissolved	12		0.050	n	ng/L	1	_	6010C	Dissolved
Manganese, Dissolved	0.38		0.010	n	ng/L	1		6010C	Dissolved
Dissolved Organic Carbon	3.9		1.0	n	ng/L	1		415.1-1974	Dissolved

#### Client Sample ID: GWE-5D-1217

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
Benzene	3.4	1.0	ug/L		8260B	Total/NA
Chlorobenzene	150	1.0	ug/L	1	8260B	Total/NA
1,2-Dichlorobenzene	3.7	1.0	ug/L	1	8260B	Total/NA

This Detection Summary does not include radiochemical test results.

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TestAmerica Job ID: 680-146390-1 SDG: KPS205

Lab Sample ID: 680-146390-6

Lab Sample ID: 680-146390-7

#### Client Sample ID: GWE-5D-1217 (Continued) Lab Sample ID: 680-146390-5 Analyte **Result Qualifier** RL MDL Unit Dil Fac D Method Prep Type 1,3-Dichlorobenzene 1.2 1.0 ug/L 1 8260B Total/NA 1,4-Dichlorobenzene ug/L 23 8260B 1.0 1 Total/NA Methane 72 0.58 **RSK-175** Total/NA ug/L 1 Iron 14 0.050 mg/L 6010C 1 Total Recoverable 0.010 Manganese 0.44 mg/L 1 6010C Total Recoverable Chloride 81 D 2.0 mg/L 2 325.2-1978 Total/NA Sulfate 460 D 250 mg/L 50 375.4-1978 Total/NA **Total Organic Carbon** 3.2 1.0 mg/L 1 415.1-1974 Total/NA Alkalinity as CaCO3 360 14 5 10 mg/L 1 SM 2320B Total/NA Carbon Dioxide, Free 52 HF J 5.0 mg/L SM 4500 CO2 C Total/NA 1

#### Client Sample ID: GWE-5D-F(0.2)-1217

#### Analyte **Result Qualifier** RL MDL Unit Dil Fac D Method Prep Type Iron, Dissolved 14 0.050 mg/L 6010C Dissolved 1 Manganese, Dissolved 0.43 0.010 Dissolved mg/L 6010C 1 **Dissolved Organic Carbon** 3.3 1.0 mg/L 415.1-1974 1 Dissolved

#### Client Sample ID: 4Q17Trip Blank #1

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Job ID: 680-146390-1 SDG: KPS205

#### Client Sample ID: PM1D-1217

Date Collected: 12/04/17 13:00 Date Received: 12/06/17 09:20

#### Lab Sample ID: 680-146390-1 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/11/17 01:22	1
Chlorobenzene	37		1.0		ug/L			12/11/17 01:22	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 01:22	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 01:22	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 01:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	104		80 - 120					12/11/17 01:22	
1,2-Dichloroethane-d4 (Surr)	99		73-131					12/11/17 01:22	1
Dibromofluoromethane (Surr)	109		80 - 122					12/11/17 01:22	1
4-Bromofluorobenzene (Surr)	100		80 - 120					12/11/17 01:22	1
Method: RSK-175 - Dissolve	d Gases (GC	)							
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			12/07/17 12:41	1
Ethylene	1.0	U	1.0		ug/L			12/07/17 12:41	1
Methane	68		0.58		ug/L			12/07/17 12:41	1
Method: 6010C - Metals (ICP	) - Total Reco	overable							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	14		0.050		mg/L		12/07/17 16:48	12/12/17 04:09	1
Manganese	0.51		0.010		mg/L		12/07/17 16:48	12/12/17 04:09	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	77	D	2.0		mg/L			12/12/17 15:39	2
Nitrate as N	0.050	UHPTJ	0.050		mg/L			12/07/17 16:53	1
Sulfate	280	$\nabla$	100		mg/L			12/13/17 08:21	20
Total Organic Carbon	2.5		1.0		mg/L			12/12/17 16:40	
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	210		5.0		mg/L			12/14/17 14:51	1
Carbon Dioxide, Free	3400		5.0		mg/L			12/14/17 14:51	

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13 14 15

Client: Solutia Inc.
Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146390-1 SDG: KPS205

Client Sample ID: PM1D-F Date Collected: 12/04/17 13:00 Date Received: 12/06/17 09:20	(0.2)-1217	,	Lab Sample ID: 680-146390 Matrix: Wa						
		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	15		0.050		mg/L		12/07/17 16:48	12/12/17 04:14	1
Manganese, Dissolved	0.53		0.010		mg/L		12/07/17 16:48	12/12/17 04:14	1
General Chemistry - Dissolve	d								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	2.7		1.0		mg/L			12/13/17 12:48	1

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TestAmerica Job ID: 680-146390-1 SDG: KPS205

12/11/17 01:44

12/11/17 01:44

Analyzed

12/11/17 01:44

12/11/17 01:44

12/11/17 01:44

12/11/17 01:44

Client Sample ID: ESL- Date Collected: 12/04/17 14	:05		Lab Sample ID: 680-1463 Matrix: V					
Date Received: 12/06/17 09:  Method: 8260B - Volatile C		unds (GC/MS	3)					
Analyte		Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Benzene	2.0	U	2.0	ug/L			12/11/17 01:44	2
Chlorobenzene	140	$\square$	2.0	ug/L			12/11/17 01:44	2
1.2-Dichlorobenzene	2.2	D	2.0	ug/L			12/11/17 01:44	2

· , · · · · · · · · · · · · · · · ·					
1,3-Dichlorobenzene	2.0	U	2.0	ug/L	
1,4-Dichlorobenzene	19	$\mathcal{D}$	2.0	ug/L	
Surrogate	%Recovery	Qualifier	Limits		Prepared
Toluene-d8 (Surr)	105		80 - 120		
1,2-Dichloroethane-d4 (Surr)	101		73 - 131		
Dibromofluoromethane (Surr)	112		80 - 122		
4-Bromofluorobenzene (Surr)	100		80 - 120		

Method: RSK-175 - Diss	olved Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	<u> </u>	1.1		ug/L			12/07/17 12:54	1
Ethylene	1.0	U	1.0		ug/L			12/07/17 12:54	1
Methane	52		0.58		ug/L			12/07/17 12:54	1

Method: 6010C - Metals (ICP) -	Total Reco	verable							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	12		0.050		mg/L		12/07/17 16:48	12/12/17 04:04	1
Manganese	0.38		0.010		mg/L		12/07/17 16:48	12/12/17 04:04	1

General Chemistry Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	93	D	2.0		mg/L			12/12/17 15:39	2
Nitrate as N	0.050	UN J	0.050		mg/L			12/07/17 17:03	1
Sulfate	490	$\mathcal{V}$	100		mg/L			12/13/17 08:20	20
Total Organic Carbon	2.9		1.0		mg/L			12/12/17 16:58	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	270		5.0		mg/L			12/14/17 14:43	1
Carbon Dioxide, Free	350		5.0		mg/L			12/14/17 14:43	1

2 8 Dil Fac 2 2 2 2

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Client: Solutia Inc.

TestAmerica	Job	ID:	680-1	46390-	·1
			SDG:	KPS20	15

#### Project/Site: 4Q17 LTM GW Sampling - 1403345 Client Sample ID: ESL-MW-D1-F(0.2)-1217 Lab Sample ID: 680-146390-4 Date Collected: 12/04/17 14:05 Matrix: Water Date Received: 12/06/17 09:20 Method: 6010C - Metals (ICP) - Dissolved Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed **Dil Fac** Iron, Dissolved 12 0.050 12/07/17 16:48 12/12/17 04:32 mg/L 1 0.38 0.010 mg/L 12/07/17 16:48 12/12/17 04:32 Manganese, Dissolved 1 **General Chemistry - Dissolved** Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed **Dil Fac Dissolved Organic Carbon** 3.9 1.0 mg/L 12/13/17 13:35 1

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TestAmerica Job ID: 680-146390-1 SDG: KPS205

Client Sample ID: GWE-5D-1217	Lab Sample ID: 680-146390-5						
Date Collected: 12/04/17 15:15					•	Matrix	x: Water
Date Received: 12/06/17 09:20							
Method: 8260B - Volatile Organic Compounds (GC/MS)	DI	MDI	Unit	_	Propored	Analyzad	Dil Ess

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	3.4	<u></u>	1.0		ug/L			12/11/17 16:05	1
Chlorobenzene	150		1.0		ug/L			12/11/17 16:05	1
1,2-Dichlorobenzene	3.7		1.0		ug/L			12/11/17 16:05	1
1,3-Dichlorobenzene	1.2		1.0		ug/L			12/11/17 16:05	1
1,4-Dichlorobenzene	23		1.0		ug/L			12/11/17 16:05	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		80 - 120					12/11/17 16:05	1
1,2-Dichloroethane-d4 (Surr)	85		73 - 131					12/11/17 16:05	1
Dibromofluoromethane (Surr)	92		80 - 122					12/11/17 16:05	1
4-Bromofluorobenzene (Surr)	97		80 - 120					12/11/17 16:05	1
Method: RSK-175 - Dissolved	d Gases (GC	)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			12/07/17 13:07	1
Ethylene	1.0	U	1.0		ug/L			12/07/17 13:07	1
Methane	72		0.58		ug/L			12/07/17 13:07	1
Method: 6010C - Metals (ICP)	) - Total Reco	overable							
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	14		0.050		mg/L		12/07/17 16:48	12/12/17 04:18	1
Manganese	0.44		0.040				10/07/17 16:40	12/12/17 04:18	1
	0.44		0.010		mg/L		12/07/17 10.40	12/12/17 04.10	
General Chemistry	0.44		0.010		mg/L		12/07/17 10:40	12/12/17 04.10	·
		Qualifier	0.010 RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Analyte		-		MDL		D			·
Analyte Chloride	Result 81		RL	MDL	Unit	D		Analyzed	Dil Fac
Analyte Chloride Nitrate as N	Result 81	DUNS		MDL	Unit mg/L	D		Analyzed 12/12/17 15:39	Dil Fac
Analyte Chloride Nitrate as N		D UHS D	<b>RL</b> 2.0 0.050	MDL	Unit mg/L mg/L	D		Analyzed 12/12/17 15:39 12/07/17 17:04	Dil Fac 2 1
General Chemistry Analyte Chloride Nitrate as N Sulfate Total Organic Carbon Alkalinity as CaCO3	Result 81 0.050 460 3.2	D UHS D	RL 2.0 0.050 250	MDL	Unit mg/L mg/L mg/L	D		Analyzed 12/12/17 15:39 12/07/17 17:04 12/13/17 08:21	<b>Dil Fac</b> 2 1 50

4 5 6 7 8 9 10 11 12 13 14 15

55D 2113/18 TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146390-1 SDG: KPS205

Client Sample ID: GWE-5D Date Collected: 12/04/17 15:15 Date Received: 12/06/17 09:20	)-F(0.2)-1217		Lab Sample ID: 680-146390 Matrix: Wat					
Method: 6010C - Metals (ICP) Analyte	- Dissolved Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	14	0.050		mg/L		12/07/17 16:48	12/12/17 03:59	1
Manganese, Dissolved	0.43	0.010		mg/L		12/07/17 16:48	12/12/17 03:59	. 1
General Chemistry - Dissolved	d							
Analyte	<b>Result Qualifier</b>	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	3.3	1.0		mg/L			12/13/17 13:51	1

SJD 2/13/18 TestAmerica Savannah

TestAmerica Job ID: 680-146390-1 SDG: KPS205

#### Client Sample ID: 4Q17Trip Blank #1 Date Collected: 12/04/17 00:00 Date Received: 12/06/17 09:20

#### Lab Sample ID: 680-146390-7 Matrix: Water

#### Method: 8260B - Volatile Organic Compounds (GC/MS) Result Qualifier Analyte RL MDL Unit Prepared **Dil Fac** D Analyzed 1.0 U Benzene 1.0 ug/L 12/10/17 18:52 1.0 U Chlorobenzene 1.0 ug/L 12/10/17 18:52 1,2-Dichlorobenzene 1.0 U 1.0 ug/L 12/10/17 18:52 1,3-Dichlorobenzene 1.0 U 1.0 ug/L 12/10/17 18:52 1,4-Dichlorobenzene 1.0 U 1.0 ug/L 12/10/17 18:52 Surrogate %Recovery Qualifier Limits Dil Fac Prepared Analyzed Toluene-d8 (Surr) 93 80 - 120 12/10/17 18:52 1,2-Dichloroethane-d4 (Surr) 94 73\_131 12/10/17 18:52 Dibromofluoromethane (Surr) 98 80 - 122 12/10/17 18:52 4-Bromofluorobenzene (Surr) 90 80 - 120 12/10/17 18:52

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33D 2/13/18 TestAmerica Savannah

#### **Surrogate Summary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

#### Method: 8260B - Volatile Organic Compounds (GC/MS) Matrix: Water

latrix: Water						Prep Type: Total/I
			Pe	rcent Surro	ogate Recovery (Ad	cceptance Limits)
		TOL	DCA	DBFM	BFB	
Lab Sample ID	Client Sample ID	(80-120)	(73-131)	(80-122)	(80-120)	
380-146390-1	PM1D-1217	104	99	109	100	
680-146390-3	ESL-MW-D1-1217	105	101	112	100	
680-146390-5	GWE-5D-1217	96	85	92	97	
80-146390-7	4Q17Trip Blank #1	93	94	98	90	
_CS 680-505810/3	Lab Control Sample	95	92	97	89	
_CS 680-505815/3	Lab Control Sample	101	104	101	99	
CS 680-505854/4	Lab Control Sample	93	92	97	96	
CSD 680-505810/4	Lab Control Sample Dup	96	93	98	92	
CSD 680-505815/4	Lab Control Sample Dup	101	102	102	100	
CSD 680-505854/5	Lab Control Sample Dup	97	92	98	100	
/IB 680-505810/9	Method Blank	93	94	100	89	
MB 680-505815/9	Method Blank	102	97	108	98	
VB 680-505854/9	Method Blank	99	84	91	96	

Surrogate Legend

TOL = Toluene-d8 (Surr)

DCA = 1,2-Dichloroethane-d4 (Surr)

DBFM = Dibromofluoromethane (Surr)

BFB = 4-Bromofluorobenzene (Surr)

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#### Method: 8260B - Volatile Organic Compounds (GC/MS)

89

Lab Sample ID: MB 680-50581 Matrix: Water Analysis Batch: 505810						(	,	ple ID: Method Prep Type: To	
	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/10/17 18:09	1
Chlorobenzene	1.0	U	1.0		ug/L			12/10/17 18:09	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/10/17 18:09	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/10/17 18:09	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/10/17 18:09	1
	МВ	MB							
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	93		80 - 120			-		12/10/17 18:09	1
1,2-Dichloroethane-d4 (Surr)	94		73-131					12/10/17 18:09	1
Dibromofluoromethane (Surr)	100		80 - 122					12/10/17 18:09	1

80 - 120

#### Lab Sample ID: LCS 680-505810/3 Matrix: Water Analysis Batch: 505810

4-Bromofluorobenzene (Surr)

	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Benzene	50.0	47.5		ug/L		95	80 - 120
Chlorobenzene	50.0	48.8		ug/L		98	80 - 120
1,2-Dichlorobenzene	50.0	48.4		ug/L		97	80 - 120
1,3-Dichlorobenzene	50.0	47.2		ug/L		94	80 - 120
1,4-Dichlorobenzene	50.0	47.8		ug/L		96	80 - 120

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	95		80 - 120
1,2-Dichloroethane-d4 (Surr)	92		73-131
Dibromofluoromethane (Surr)	97		80 - 122
4-Bromofluorobenzene (Surr)	89		80 - 120

#### Lab Sample ID: LCSD 680-505810/4 Matrix: Water Analysis Batch: 505810

······ <b>························</b>	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	50.0	48.2		ug/L		96	80 - 120	1	20
Chlorobenzene	50.0	49.7		ug/L		99	80 - 120	2	20
1,2-Dichlorobenzene	50.0	49.1		ug/L		98	80 - 120	1	20
1,3-Dichlorobenzene	50.0	47.9		ug/L		96	80 - 120	2	20
1,4-Dichlorobenzene	50.0	48.4		ug/L		97	80 - 120	1	20

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	96		80 - 120
1,2-Dichloroethane-d4 (Surr)	93		73 - 131
Dibromofluoromethane (Surr)	98		80 - 122
4-Bromofluorobenzene (Surr)	92		80 - 120

### Client Sample ID: Lab Control Sample

Prep Type: Total/NA

12/10/17 18:09

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#### Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

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#### **QC Sample Results**

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#### Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-505815/9 Matrix: Water Analysis Batch: 505815	Э					C	Client Sam	ple ID: Method Prep Type: To	
2	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/10/17 18:22	1
Chlorobenzene	1.0	U	1.0		ug/L			12/10/17 18:22	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/10/17 18:22	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/10/17 18:22	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/10/17 18:22	1
	МВ	МВ							

	1110	mb			
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed
Toluene-d8 (Surr)	102		80 - 120		12/10/17 18:22
1,2-Dichloroethane-d4 (Surr)	97		73 - 131		12/10/17 18:22
Dibromofluoromethane (Surr)	108		80 - 122		12/10/17 18:22
4-Bromofluorobenzene (Surr)	98		80 - 120		12/10/17 18:22

#### Lab Sample ID: LCS 680-505815/3 Matrix: Water Analysis Batch: 505815

	Spike	LCS	LCS			%Rec.	
Analyte	Added	Result	Qualifier Unit	D	%Rec	Limits	
Benzene	50.0	51.4	ug/L		103	80 - 120	
Chlorobenzene	50.0	50.1	ug/L		100	80 - 120	
1,2-Dichlorobenzene	50.0	49.8	ug/L		100	80 - 120	
1,3-Dichlorobenzene	50.0	49.2	ug/L		98	80 - 120	
1,4-Dichlorobenzene	50.0	49.6	ug/L		99	80 - 120	

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	101		80 - 120
1,2-Dichloroethane-d4 (Surr)	104		73 - 131
Dibromofluoromethane (Surr)	101		80 - 122
4-Bromofluorobenzene (Surr)	99		80 - 120

#### Lab Sample ID: LCSD 680-505815/4 Matrix: Water Analysis Batch: 505815

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	50.0	51.4		ug/L		103	80 - 120	0	20
Chlorobenzene	50.0	49.8		ug/L		100	80 - 120	1	20
1,2-Dichlorobenzene	50.0	48.9		ug/L		98	80 - 120	2	20
1,3-Dichlorobenzene	50.0	49.0		ug/L		98	80 - 120	0	20
1,4-Dichlorobenzene	50.0	49.5		ug/L		99	80 - 120	0	20

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	101		80 - 120
1,2-Dichloroethane-d4 (Surr)	102		73 - 131
Dibromofluoromethane (Surr)	102		80 - 122
4-Bromofluorobenzene (Surr)	100		80 - 120

#### **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

			%Rec.		
it	D	%Rec	Limits		
/1		102	00 400	 	_

#### Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

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#### **QC Sample Results**

#### Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

91

96

Lab Sample ID: MB 680-505 Matrix: Water Analysis Batch: 505854	5854/9					(	Client Sam	ple ID: Method Prep Type: To	
-	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/11/17 13:37	1
Chlorobenzene	1.0	U	1.0		ug/L			12/11/17 13:37	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 13:37	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 13:37	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 13:37	1
	MB	MB							
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		80 - 120			-		12/11/17 13:37	1
1,2-Dichloroethane-d4 (Surr)	84		73-131					12/11/17 13:37	1

#### Lab Sample ID: LCS 680-505854/4 Matrix: Water Analysis Batch: 505854

Dibromofluoromethane (Surr)

4-Bromofluorobenzene (Surr)

-	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Benzene	50.0	49.1		ug/L		98	80 - 120
Chlorobenzene	50.0	49.3		ug/L		99	80 - 120
1,2-Dichlorobenzene	50.0	48.9		ug/L		98	80 - 120
1,3-Dichlorobenzene	50.0	48.8		ug/L		98	80 - 120
1,4-Dichlorobenzene	50.0	49.0		ug/L		98	80 <sub>-</sub> 120

80 - 122

80 - 120

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	93		80 - 120
1,2-Dichloroethane-d4 (Surr)	92		73 - 131
Dibromofluoromethane (Surr)	97		80 - 122
4-Bromofluorobenzene (Surr)	96		80 - 120

#### Lab Sample ID: LCSD 680-505854/5 Matrix: Water Analysis Batch: 505854

Analysis Batom cooco-	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	50.0	50.5	1	ug/L		101	80 - 120	3	20
Chlorobenzene	50.0	49.8		ug/L		100	80 - 120	1	20
1,2-Dichlorobenzene	50.0	50.2		ug/L		100	80 - 120	3	20
1,3-Dichlorobenzene	50.0	49.3		ug/L		99	80 - 120	1	20
1,4-Dichlorobenzene	50.0	50.1		ug/L		100	80 - 120	2	20

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	97		80 - 120
1,2-Dichloroethane-d4 (Surr)	92		73 - 131
Dibromofluoromethane (Surr)	98		80 - 122
4-Bromofluorobenzene (Surr)	100		80 - 120

#### **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

12/11/17 13:37

12/11/17 13:37

#### Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

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#### Method: RSK-175 - Dissolved Gases (GC) Lab Sample ID: MB 680-505384/10 **Client Sample ID: Method Blank** Matrix: Water Prep Type: Total/NA Analysis Batch: 505384 MB MB **Result Qualifier** RL Analyte **MDL Unit** D Prepared Analyzed **Dil Fac** Ethane 1.1 U 1.1 ug/L 12/07/17 10:49 Ethylene 1.0 U 1.0 ug/L 12/07/17 10:49 Methane 0.58 U 0.58 ug/L 12/07/17 10:49 Lab Sample ID: LCS 680-505384/3 **Client Sample ID: Lab Control Sample** Matrix: Water Prep Type: Total/NA Analysis Batch: 505384 Spike LCS LCS %Rec. Analyte Added **Result Qualifier** Unit D %Rec Limits Ethane 288 271 94 75 - 125 ug/L Ethylene 269 256 ug/L 95 75 - 125 Lab Sample ID: LCSD 680-505384/4 **Client Sample ID: Lab Control Sample Dup** Matrix: Water Prep Type: Total/NA Analysis Batch: 505384

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Ethane	288	266		ug/L		92	75 - 125	2	30
Ethylene	269	247		ug/L		92	75 - 125	4	30

#### Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-505503/1-A Matrix: Water Analysis Batch: 506043	МВ	МВ					Prep Type	le ID: Method : Total Recov Prep Batch: (	verable
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.050	U	0.050		mg/L		12/07/17 16:48	12/12/17 02:16	1
Iron, Dissolved	0.050	U	0.050		mg/L		12/07/17 16:48	12/12/17 02:16	1
Manganese	0.010	U	0.010		mg/L		12/07/17 16:48	12/12/17 02:16	1
Manganese, Dissolved	0.010	U	0.010		mg/L		12/07/17 16:48	12/12/17 02:16	1

#### Lab Sample ID: LCS 680-505503/2-A Matrix: Water

#### **Client Sample ID: Lab Control Sample** Prep Type: Total Recoverable

Analysis Batch: 506043					•		Prep Batch: 505503
······ <b>,</b> ·····	Spike	LCS L	LCS				%Rec.
Analyte	Added	Result (	Qualifier	Unit	D	%Rec	Limits
Iron	5.00	5.34		mg/L		107	80 - 120
Iron, Dissolved	5.00	5.34		mg/L		107	80 - 120
Manganese	0.500	0.577		mg/L		115	80 - 120
Manganese, Dissolved	0.500	0.577		mg/L		115	80 - 120

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#### **QC Sample Results**

#### Method: 310.1-1978 - Alkalinity

Lab Sample ID: MB 680-507266/7									C	Clie	nt Sam	ple ID: M		
Matrix: Water												Prep Ty	pe: To	tal/NA
Analysis Batch: 507266														
		MB												
Analyte		Qualifier		RL		RL			D	Pr	epared	Analyz		Dil Fac
Alkalinity	5.0			5.0			mg/L					12/14/17		1
Carbon Dioxide, Free	5.0	U		5.0			mg/L					12/14/17	11:57	1
Lab Sample ID: LCS 680-507266/8 Matrix: Water								Cli	ent S	San	nple ID	: Lab Cor Prep Tyj		
Analysis Batch: 507266			Spike		LCS	LCS						%Rec.		
Analyte			Added	P	lesult		ifior	Unit		D	%Rec	Limits		
Alkalinity			250		250	Quai		mg/L		_	100	80 - 120		
			200		200			mg/L			100	00-120		
Lab Sample ID: LCSD 680-507266/3 Matrix: Water Analysis Batch: 507266	39						С	lient S	Samp	ole	ID: Lab	Control Prep Ty		
, <b>,</b>			Spike	L	CSD	LCSI	D					%Rec.		RPD
Analyte			Added	R	lesult	Qual	ifier	Unit		D	%Rec	Limits	RPD	Limit
Alkalinity			250		254			mg/L		_	102	80 - 120	1	30
ethod: 325.2-1978 - Chloride	!													
1 ah Sampla ID: MD 690 606197/12									(	Slie	ent Sam	ple ID: M	ethod	Blank
Matrix: Water Analysis Batch: 506187		MB		DI			11					Prep Ty	pe: To	otal/NA
Matrix: Water Analysis Batch: 506187 <sup>Analyte</sup>	Result	Qualifier		RL	ſ	NDL	-		D		repared	Prep Ty	pe: To zed	Dil Fac
Matrix: Water Analysis Batch: 506187 <sup>Analyte</sup>		Qualifier		<b>RL</b> 1.0	P		Unit mg/L					Prep Ty	pe: To zed	Dil Fac
Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water	Result 1.0	Qualifier			ŗ		-	Cli	<b>D</b>	Pi	repared	Prep Ty	pe: To zed 14:25 ntrol S	Dil Fac
Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water	Result 1.0	Qualifier					mg/L	CI	<b>D</b>	Pi	repared	Prep Ty 	pe: To zed 14:25 ntrol S	Dil Fac
Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water Analysis Batch: 506187	Result 1.0	Qualifier	Spike Added	1.0		LCS	mg/L	Cli	<b>D</b>	Pı Sar	repared	Prep Ty Analy: 12/12/17 : Lab Cor Prep Ty	pe: To zed 14:25 ntrol S	Dil Fac
Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water Analysis Batch: 506187 Analyte	Result 1.0	Qualifier	•	1.0	LCS	LCS	mg/L		<b>D</b>	Pı Sar	repared mple ID	Prep Ty Analy: 12/12/17 : Lab Cor Prep Ty %Rec.	pe: To zed 14:25 ntrol S	Dil Fac
Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water Analysis Batch: 506187 Chloride Lab Sample ID: LCSD 680-506187/ <sup>1</sup> Matrix: Water	Result 1.0	Qualifier	Added	1.0	LCS Result	LCS	mg/L	Unit mg/L	D ient \$	Pr Sar	repared mple ID <u>%Rec</u> 106	Prep Ty Analy: 12/12/17 : Lab Cor Prep Ty %Rec. Limits	pe: To zed 14:25 ntrol S pe: To Samp	Dil Fac
Matrix: Water Analysis Batch: 506187 Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water Analysis Batch: 506187 Chloride Lab Sample ID: LCSD 680-506187/ <sup>1</sup> Matrix: Water	Result 1.0	Qualifier	Added 25.0	1.0	LCS Result 26.4	LCS Qual	ifier C	Unit mg/L	D ient \$	Pr Sar	repared mple ID <u>%Rec</u> 106	Prep Ty Analy: 12/12/17 : Lab Cor Prep Ty %Rec. Limits 85-115 O Control Prep Ty	pe: To zed 14:25 ntrol S pe: To Samp	Dil Fac
Matrix: Water Analysis Batch: 506187 Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water Analysis Batch: 506187 Chloride Lab Sample ID: LCSD 680-506187/ Matrix: Water Analysis Batch: 506187	Result 1.0	Qualifier	Added 25.0 Spike	1.0 R	LCS Result 26.4	LCS Qual	ifier C	Unit mg/L	D ient \$	Pr Sar	nple ID %Rec 106 ID: Lat	Prep Ty Analy: 12/12/17 : Lab Cor Prep Ty %Rec. Limits 85 - 115 o Control Prep Ty %Rec.	pe: To <sup>zed</sup> 14:25 ntrol S pe: To Samp pe: To	Dil Fac 1 Sample Dital/NA
Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water Analysis Batch: 506187 Chloride Lab Sample ID: LCSD 680-506187/ Matrix: Water Analysis Batch: 506187 Analyte	Result 1.0	Qualifier	Added 25.0 Spike Added	1.0 R	LCS Result 26.4 LCSD Result	LCS Qual	ifier C	Unit mg/L Client \$	D ient \$	Pr Sar	repared mple ID <u>%Rec</u> ID: Lat	Prep Ty Analy: 12/12/17 : Lab Cor Prep Ty %Rec. Limits 85 - 115 O Control Prep Ty %Rec. Limits	pe: To zed 14:25 ntrol S pe: To Samp pe: To RPD	Dil Fac Dil Fac 1 Sample Dtal/NA Ne Dup Dtal/NA
Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water Analysis Batch: 506187 Chloride Lab Sample ID: LCSD 680-506187/ Matrix: Water Analysis Batch: 506187 Analyte Chloride	Result 1.0	Qualifier U	Added 25.0 Spike Added 25.0	1.0 R	LCS Result 26.4	LCS Qual	ifier C	Unit mg/L	D ient \$	Pr Sar	nple ID %Rec 106 ID: Lat	Prep Ty Analy: 12/12/17 : Lab Cor Prep Ty %Rec. Limits 85 - 115 o Control Prep Ty %Rec.	pe: To <sup>zed</sup> 14:25 ntrol S pe: To Samp pe: To	Dil Fac Dil Fac Sample Dtal/NA
Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCSD 680-506187/ Matrix: Water Analysis Batch: 506187 Analyte Chloride Itab Sample ID: LCSD 680-506187/ Matrix: Water	Result 1.0	Qualifier U	Added 25.0 Spike Added 25.0	1.0 R	LCS Result 26.4 LCSD Result	LCS Qual	ifier C	Unit mg/L Client \$	D ient S Samı	Pr Sar D D	repared mple ID <u>%Rec</u> 106 ID: Lak <u>%Rec</u> 108	Prep Ty Analy: 12/12/17 : Lab Cor Prep Ty %Rec. Limits 85 - 115 O Control Prep Ty %Rec. Limits 85 - 115	pe: To zed 14:25 ntrol S pe: To Samp pe: To RPD 2	Dil Fac Dil Fac Sample Dtal/NA
Lab Sample ID: MB 680-506187/13 Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCSD 680-506187/7 Matrix: Water Analysis Batch: 506187 Analyte Chloride Method: 353.2-1993 R2.0 - Nitr Lab Sample ID: MB 680-505640/13 Matrix: Water	Result 1.0	Qualifier U	Added 25.0 Spike Added 25.0	1.0 R	LCS Result 26.4 LCSD Result	LCS Qual	ifier C	Unit mg/L Client \$	D ient S Samı	Pr Sar D D	repared mple ID <u>%Rec</u> 106 ID: Lak <u>%Rec</u> 108	Prep Ty Analy: 12/12/17 : Lab Cor Prep Ty %Rec. Limits 85-115 O Control Prep Ty %Rec. Limits 85-115	pe: To zed 14:25 htrol S pe: To Samp pe: To 2 lethod	Dil Fac Dil Fac Sample Dtal/NA Die Dup Dtal/NA RPC D Limii 30
Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCSD 680-506187/7 Matrix: Water Analysis Batch: 506187 Analyte Chloride Ide Analyte Chloride	Result 1.0	Qualifier U	Added 25.0 Spike Added 25.0	1.0 R	LCS Result 26.4 LCSD Result	LCS Qual	ifier C	Unit mg/L Client \$	D ient S Samı	Pr Sar D D	repared mple ID <u>%Rec</u> 106 ID: Lak <u>%Rec</u> 108	Prep Ty Analy: 12/12/17 : Lab Cor Prep Ty %Rec. Limits 85 - 115 O Control Prep Ty %Rec. Limits 85 - 115	pe: To zed 14:25 htrol S pe: To Samp pe: To 2 lethod	Dil Fac Dil Fac 1 Sample Dtal/NA De Dup Dtal/NA RPD 2 Limit 30 I Blank
Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCS 680-506187/14 Matrix: Water Analysis Batch: 506187 Analyte Chloride Lab Sample ID: LCSD 680-506187/7 Matrix: Water Analysis Batch: 506187 Analyte Chloride Ide Sample ID: MB 680-505640/13 Matrix: Water	Result 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Qualifier U	Added 25.0 Spike Added 25.0	1.0 R	LCS Result 26.4	LCS Qual	lifier C	Unit mg/L Client \$	D ient S Samı	Pr Sar D D D Clie	repared mple ID <u>%Rec</u> 106 ID: Lak <u>%Rec</u> 108	Prep Ty Analy: 12/12/17 : Lab Cor Prep Ty %Rec. Limits 85-115 O Control Prep Ty %Rec. Limits 85-115	pe: To zed 14:25 htrol S pe: To Samp pe: To 2 lethod pe: To	Dil Fac Dil Fac 1 Sample Dtal/NA De Dup Dtal/NA RPD 2 Limit 30 I Blank

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Client Sample ID: PM1D-1217

Client Sample ID: PM1D-1217

Prep Type: Total/NA

Prep Type: Total/NA

#### Method: 353.2-1993 R2.0 - Nitrogen, Nitrate-Nitrite (Continued)

Lab Sample ID: LCS 680-505640/16 Matrix: Water Analysis Batch: 505640				Cli	ent Sar	nple ID	): Lab Control Sample Prep Type: Total/NA
-	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Nitrate as N	0.500	0.513		mg/L		103	75 - 125
Nitrate Nitrite as N	1.00	1.01		mg/L		101	90 - 110
Nitrite as N	0.500	0.497		mg/L		99	90 - 110

#### Lab Sample ID: 680-146390-1 MS Matrix: Water

Analysis Batch: 505640

,	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Nitrate as N	0.050	UHF1	0.500	0.323	F1	mg/L		65	75 - 125
Nitrate Nitrite as N	0.050	U H F1	1.00	0.667	F1	mg/L		67	90 - 110
Nitrite as N	0.050	UHF1	0.500	0.344	F1	mg/L		66	90_110

#### Lab Sample ID: 680-146390-1 MSD Matrix: Water Analysis Batch: 505640

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Nitrate as N	0.050	UHF1	0.500	0.329	F1	mg/L		66	75 - 125	2	30
Nitrate Nitrite as N	0.050	UHF1	1.00	0.675	F1	mg/L		67	90 - 110	1	10
Nitrite as N	0.050	UHF1	0.500	0.346	F1	mg/L		66	90 - 110	1	10

#### Method: 375.4-1978 - Sulfate

Lab Sample ID: MB 680-506186/19 Matrix: Water Analysis Batch: 506186									Clie	nt Sam	ple ID: Meti Prep Type		
Allalysis Balcil. 500100	MB	МВ											
Analyte	Result	Qualifier		RL	I	MDL	Unit	I	D Pi	repared	Analyzed	ł	Dil Fac
Sulfate	5.0	U		5.0			mg/L				12/12/17 14	27	1
Lab Sample ID: LCS 680-506186/20 Matrix: Water Analysis Batch: 506186								Clie	nt Sar	nple ID	: Lab Contr Prep Type		
,			Spike		LCS	LCS	;				%Rec.		
Analyte			Added		Result	Qua	lifier	Unit	D	%Rec	Limits		
Sulfate			20.0		20.6			mg/L		103	75 - 125		
Lab Sample ID: LCSD 680-506186/2 Matrix: Water Analysis Batch: 506186	22						C	lient Sa	ample	ID: Lab	Control Sa Prep Type		
			Spike		LCSD	LCS	D				%Rec.		RPD
Analyte			Added		Result	Qua	lifier	Unit	D	%Rec	Limits	RPD	Limit
Sulfate			20.0		18.4			mg/L		92	75 - 125	11	30

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#### **QC Sample Results**

#### Method: 415.1-1974 - DOC

Matrix: Water Analysis Batch: 506528 Analyte Dissolved Organic Carbon		MB N										Prep Type:	Diss	solved
Analyte Dissolved Organic Carbon														
Dissolved Organic Carbon		MD .												
Dissolved Organic Carbon	Pa													
-	ite:		Qualifier		RL		MDL	Unit		D	Prepared	Analyzeo	I	Dil Fa
		1.0 L	1		1.0			mg/L				12/13/17 11	:45	
Lab Sample ID: LCS 680-50	6528/4								Cli	ient Sa	ample ID	: Lab Contr	ol Si	ample
Matrix: Water												Prep Type:		
Analysis Batch: 506528													2100	
				Spike		LCS	LCS	;				%Rec.		
Analyte				Added		Result	Qua	lifier	Unit	0	) %Rec	Limits		
Dissolved Organic Carbon			teaching	20.0		20.7			mg/L		104	80 - 120		
Lah Samala ID: LCSD 690 /								~	liant	200001		Control Co		- D
Lab Sample ID: LCSD 680-5	00020/0							C	ment a	sampi		Control Sa		
Matrix: Water												Prep Type:	DISS	solve
Analysis Batch: 506528				Calles		1000	1.00	n				% Dec		-
Analista				Spike		LCSD			11	-		%Rec.	000	RP
Analyte				Added		Result	Qua	lifier	Unit		D %Rec	Limits	RPD	Lim
Dissolved Organic Carbon				20.0		20.2			mg/L		101	80 - 120	3	2
Lab Sample ID: 680-146390	-2 MS									Client	Sample	ID: PM1D-F	(0.2)	)-121
Matrix: Water												Prep Type:	Diss	solve
Analysis Batch: 506528														
•	Sample	Samp	le	Spike		MS	MS					%Rec.		
Analyte	Result	Qualif	fier	Added		Result	Qua	lifier	Unit		D %Rec	Limits		
Dissolved Organic Carbon	2.7			20.0		22.7			mg/L		100	80 - 120		
Lab Sample ID: 680-146390	-2 MSD									Client	Sample	ID: PM1D-F	:(0 2	)-121 <sup>.</sup>
Matrix: Water											. oumpro	Prep Type:	•	
Analysis Batch: 506528													2.00	
	Sample	Samp	ole	Spike		MSD	MSE	C				%Rec.		RP
Analyte	Result	-		Added		Result	Qua	lifier	Unit	I	D %Rec	Limits	RPD	Lim
Dissolved Organic Carbon	2.7			20.0		22.5			mg/L		99	80 - 120	1	
lethod: 415.1-1974 - TC	)C									3				
Lab Sample ID: MB 680-506 Matrix: Water	3208/2									C	lient San	nple ID: Met Prep Type		
Analysis Batch: 506208												Ticp Type		
		MB M	MB											
Analyte	Re	esult (	Qualifier		RL	1	MDL	Unit		D	Prepared	Analyze	ł	Dil Fa
Total Organic Carbon		1.0 L			1.0			mg/∟			•	12/12/17 14		
Lab Sample ID: LCS 680-50	16208/3								CI	iont S	amolo IF	): Lab Conti	2 10	amnl
Matrix: Water												Prep Type		
Analysis Batch: 506208												i ich i îhe	. 10	GUITE
Analysis Datoll. 900200				Spike		108	LCS	\$				%Rec.		
				Added		Result			11		D %Rec	Limits		
Analyte				AUTER		Resilin		litier	Unit			1 mms		

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#### **QC Sample Results**

#### Method: 415.1-1974 - TOC (Continued)

Lab Sample ID: LCSD 680-506208/4 Matrix: Water Analysis Batch: 506208			C	Client Sa	ample	ID: Lai	o Control S Prep Tyj	•	
	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Total Organic Carbon	20.0	19.2		mg/L		96	80 - 120	1	25

#### Method: SM 2320B - Alkalinity

Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007									Cli	ent San	nple ID: Method Prep Type: To	
-	MB	MB										
Analyte	Result	Qualifier		RL	ľ	MDL	Unit		D F	Prepared	Analyzed	Dil Fac
Alkalinity as CaCO3	5.0	U		5.0			mg/∟				12/26/17 19:08	1
Lab Sample ID: LCS 310-190007/2								Clie	ent Sa	mple ID	: Lab Control	Sample
Matrix: Water										•	Prep Type: T	
Analysis Batch: 190007												
-			Spike		LCS	LCS					%Rec.	
Analyte			Added	1	Result	Qua	lifier	Unit	D	%Rec	Limits	
Alkalinity as CaCO3			1060		1010			mg/L		96	90 - 110	

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#### **QC Association Summary**

#### GC/MS VOA

#### Analysis Batch: 505810 Lab Sample ID **Client Sample ID** Ргер Туре Matrix Method **Prep Batch** 680-146390-7 4Q17Trip Blank #1 Total/NA Water 8260B MB 680-505810/9 Method Blank Total/NA Water 8260B LCS 680-505810/3 Lab Control Sample Total/NA Water 8260B LCSD 680-505810/4 Lab Control Sample Dup Total/NA Water 8260B Analysis Batch: 505815 Lab Sample ID **Client Sample ID** Prep Type Matrix Method **Prep Batch** 680-146390-1 PM1D-1217 Total/NA Water 8260B 680-146390-3 ESL-MW-D1-1217 Total/NA Water 8260B MB 680-505815/9 Total/NA Water 8260B Method Blank LCS 680-505815/3 Lab Control Sample Total/NA Water 8260B LCSD 680-505815/4 Lab Control Sample Dup Total/NA Water 8260B Analysis Batch: 505854 Lab Sample ID **Client Sample ID** Matrix Method **Prep Batch** Prep Type 680-146390-5 GWE-5D-1217 Total/NA Water 8260B Water 8260B MB 680-505854/9 Method Blank Total/NA LCS 680-505854/4 Lab Control Sample Total/NA Water 8260B Total/NA Water 8260B LCSD 680-505854/5 Lab Control Sample Dup

#### GC VOA

#### Analysis Batch: 505384

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-146390-1	PM1D-1217	Total/NA	Water	RSK-175	
680-146390-3	ESL-MW-D1-1217	Total/NA	Water	RSK-175	
680-146390-5	GWE-5D-1217	Total/NA	Water	RSK-175	
MB 680-505384/10	Method Blank	Total/NA	Water	RSK-175	
LCS 680-505384/3	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-505384/4	Lab Control Sample Dup	Total/NA	Water	RSK-175	

#### Metals

#### Prep Batch: 505503

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-146390-1	PM1D-1217	Total Recoverable	Water	3005A	
680-146390-2	PM1D-F(0.2)-1217	Dissolved	Water	3005A	
680-146390-3	ESL-MW-D1-1217	Total Recoverable	Water	3005A	
680-146390-4	ESL-MW-D1-F(0.2)-1217	Dissolved	Water	3005A	
680-146390-5	GWE-5D-1217	Total Recoverable	Water	3005A	
680-146390-6	GWE-5D-F(0.2)-1217	Dissolved	Water	3005A	
MB 680-505503/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-505503/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
Analysis Batch: 506	043				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146390-1	PM1D-1217	Total Recoverable	Water	6010C	505503
680-146390-2	PM1D-F(0.2)-1217	Dissolved	Water	6010C	505503
680-146390-3	ESL-MW-D1-1217	Total Recoverable	Water	6010C	505503
680-146390-4	ESL-MW-D1-F(0.2)-1217	Dissolved	Water	6010C	505503
I				SJDA	7/13/18

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#### **QC Association Summary**

#### Metals (Continued)

Analysis Batch: 5060	Analysis Batch: 506043 (Continued)											
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch							
680-146390-5	GWE-5D-1217	Total Recoverable	Water	6010C	505503							
680-146390-6	GWE-5D-F(0.2)-1217	Dissolved	Water	6010C	505503							
MB 680-505503/1-A	Method Blank	Total Recoverable	Water	6010C	505503							
LCS 680-505503/2-A	Lab Control Sample	Total Recoverable	Water	6010C	505503							

#### **General Chemistry**

Analysis	Batch:	189992	

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-146390-5	GWE-5D-1217	Total/NA	Water	SM 4500 CO2 C	
Analysis Batch: 1900	007				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146390-5	GWE-5D-1217	Total/NA	Water	SM 2320B	
MB 310-190007/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-190007/2	Lab Control Sample	Total/NA	Water	SM 2320B	
Analysis Batch: 5056	540				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146390-1	PM1D-1217	Total/NA	Water	353.2-1993 R2.0	
680-146390-3	ESL-MW-D1-1217	Total/NA	Water	353.2-1993 R2.0	
680-146390-5	GWE-5D-1217	Total/NA	Water	353.2-1993 R2.0	
MB 680-505640/13	Method Blank	Total/NA	Water	353.2-1993 R2.0	
LCS 680-505640/16	Lab Control Sample	Total/NA	Water	353.2-1993 R2.0	
680-146390-1 MS	PM1D-1217	Total/NA	Water	353.2-1993 R2.0	
680-146390-1 MSD	PM1D-1217	Total/NA	Water	353.2-1993 R2.0	
Analysis Batch: 506	186				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146390-1	PM1D-1217	Total/NA	Water	375.4-1978	
680-146390-3	ESL-MW-D1-1217	Total/NA	Water	375.4-1978	
680-146390-5	GWE-5D-1217	Total/NA	Water	375.4-1978	
MB 680-506186/19	Method Blank	Total/NA	Water	375.4-1978	
LCS 680-506186/20	Lab Control Sample	Total/NA	Water	375.4-1978	
LCSD 680-506186/22	Lab Control Sample Dup	Total/NA	Water	375.4-1978	
Analysis Batch: 506 <sup>,</sup>	187				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146390-1	PM1D-1217	Total/NA	Water	325.2-1978	
680-146390-3	ESL-MW-D1-1217	Total/NA	Water	325.2-1978	
680-146390-5	GWE-5D-1217	Total/NA	Water	325.2-1978	
MB 680-506187/13	Method Blank	Total/NA	Water	325.2-1978	
LCS 680-506187/14	Lab Control Sample	Total/NA	Water	325.2-1978	
LCSD 680-506187/18	Lab Control Sample Dup	Total/NA	Water	325.2-1978	
Analysis Batch: 506	208				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-146390-1	PM1D-1217	Total/NA	Water	415.1-1974	
680-146390-3	ESL-MW-D1-1217	Total/NA	Water	415.1-1974	
680-146390-5	GWE-5D-1217	Total/NA	Water	415.1-1974	
				53D 2	113/18
					- Covennel

TestAmerica Savannah

#### **QC Association Summary**

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

#### TestAmerica Job ID: 680-146390-1 SDG: KPS205

General Chemistry (Continued)

#### Analysis Batch: 506208 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 680-506208/2	Method Blank	Total/NA	Water	415.1-1974	
LCS 680-506208/3	Lab Control Sample	Total/NA	Water	415.1-1974	
LCSD 680-506208/4	Lab Control Sample Dup	Total/NA	Water	415.1-1974	
nalysis Batch: 506	528				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146390-2	PM1D-F(0.2)-1217	Dissolved	Water	415.1-1974	
680-146390-4	ESL-MW-D1-F(0.2)-1217	Dissolved	Water	415.1-1974	
680-146390-6	GWE-5D-F(0.2)-1217	Dissolved	Water	415.1-1974	
MB 680-506528/2	Method Blank	Dissolved	Water	415.1-1974	
LCS 680-506528/4	Lab Control Sample	Dissolved	Water	415.1-1974	
LCSD 680-506528/5	Lab Control Sample Dup	Dissolved	Water	415.1-1974	
680-146390-2 MS	PM1D-F(0.2)-1217	Dissolved	Water	415.1-1974	
680-146390-2 MSD	PM1D-F(0.2)-1217	Dissolved	Water	415.1-1974	
analysis Batch: 507	266				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146390-1	PM1D-1217	Total/NA	Water	310.1-1978	
690 146200 2	ECL MM/ D4 4047	Tetel/NIA	10/=+==	240 4 4070	

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146390-1	PM1D-1217	Total/NA	Water	310.1-1978	
680-146390-3	ESL-MW-D1-1217	Total/NA	Water	310.1-1978	
MB 680-507266/7	Method Blank	Total/NA	Water	310.1-1978	
LCS 680-507266/8	Lab Control Sample	Total/NA	Water	310.1-1978	
LCSD 680-507266/39	Lab Control Sample Dup	Total/NA	Water	310.1-1978	

4 5 7 8 9 10 11 12 13 14

TestAmerica Job ID: 680-146390-1 SDG: KPS205

## Client Sample ID: PM1D-1217

#### Lab Sample ID: 680-146390-1 Matrix: Water

Date Collected: Date Received:								
Ргер Туре	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	505815	12/11/17 01:22	UI	TAL SAV
Total/NA	Analysis	RSK-175		1	505384	12/07/17 12:41	KAB	TAL SAV
Total Recoverable	Prep	3005A			505503	12/07/17 16:48	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1	506043	12/12/17 04:09	BWR	TAL SAV
Total/NA	Analysis	310.1-1978		1	507266	12/14/17 14:51	KLD	TAL SAV
Total/NA	Analysis	325.2-1978		2	506187	12/12/17 15:39	ALG	TAL SAV
Total/NA	Analysis	353.2-1993 R2.0		1	505640	12/07/17 16:53	AMH	TAL SAV
Total/NA	Analysis	375.4-1978		20	506186	12/13/17 08:21	ALG	TAL SAV
Total/NA	Analysis	415.1-1974		1	506208	12/12/17 16:40	KLD	TAL SAV

#### Client Sample ID: PM1D-F(0.2)-1217 Date Collected: 12/04/17 13:00

Date Received: 12/06/17 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analvst	Lab
Dissolved	Prep	3005A				12/07/17 16:48		TAL SAV
Dissolved	Analysis	6010C		1	506043	12/12/17 04:14	BWR	TAL SAV
Dissolved	Analysis	415.1-1974		1	506528	12/13/17 12:48	KLD	TAL SAV

#### Client Sample ID: ESL-MW-D1-1217 Date Collected: 12/04/17 14:05

Date Received: 12/06/17 09:20

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		2	505815	12/11/17 01:44	UI	TAL SAV
Total/NA	Analysis	RSK-175		1	505384	12/07/17 12:54	KAB	TAL SAV
Total Recoverable	Prep	3005A			505503	12/07/17 16:48	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1	506043	12/12/17 04:04	BWR	TAL SAV
Total/NA	Analysis	310.1-1978		1	507266	12/14/17 14:43	KLD	TAL SAV
Total/NA	Analysis	325.2-1978		2	506187	12/12/17 15:39	ALG	TAL SAV
Total/NA	Analysis	353.2-1993 R2.0		1	505640	12/07/17 17:03	AMH	TAL SAV
Total/NA	Analysis	375.4-1978		20	506186	12/13/17 08:20	ALG	TAL SAV
Total/NA	Analysis	415.1-1974		1	506208	12/12/17 16:58	KLD	TAL SAV

#### Client Sample ID: ESL-MW-D1-F(0.2)-1217 Date Collected: 12/04/17 14:05 Date Received: 12/06/17 09:20

#### Batch Batch Dilution Batch Prepared Prep Type Туре Method Run Factor Number or Analyzed Analyst Lab Dissolved Prep 3005A 505503 12/07/17 16:48 AJR TAL SAV Dissolved Analysis 6010C 506043 12/12/17 04:32 BWR TAL SAV 1 55D 2113/18

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## Lab Sample ID: 680-146390-3

Lab Sample ID: 680-146390-2

Matrix: Water

Matrix: Water

Lab Sample ID: 680-146390-4 Matrix: Water

Ргер Туре	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	415.1-1974		1	506528	12/13/17 13:35	KLD	TAL SAV
lient Sample	D: GW	E-5D-1217					Lab Sa	mple ID: 68
Date Collected: 1 Date Received: 1								
~	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	505854	12/11/17 16:05	JLK	TAL SAV
Total/NA	Analysis	RSK-175		1	505384	12/07/17 13:07	KAB	TAL SAV
Total Recoverable	Prep	3005A			505503	12/07/17 16:48	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1	506043	12/12/17 04:18	BWR	TAL SAV
Total/NA	Analysis	325.2-1978		2	506187	12/12/17 15:39	ALG	TAL SAV
Total/NA	Analysis	353.2-1993 R2.0		1	505640	12/07/17 17:04	AMH	TAL SAV
Total/NA	Analysis	375.4-1978		50	506186	12/13/17 08:21	ALG	TAL SAV
Total/NA	Analysis	415.1-1974		1	506208	12/12/17 17:15	KLD	TAL SAV
T-1-1010	Analysis	SM 2320B		1	190007	12/26/17 19:08	BER	TAL CF
Total/NA								

Lab Chronicle

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

Client Sample ID: ESL-MW-D1-F(0.2)-1217

Date Collected: 12/04/17 14:05

Date Received: 12/06/17 09:20

Lab Sample ID: 680-146390-4

# 80-146390-5 Matrix: Water

Matrix: Water

12 13

Client Sample ID: GWE-5D-F(0.2)-1217 Date Collected: 12/04/17 15:15 Date Received: 12/06/17 09:20

Lab Sample ID: 680-146390-6 Matrix: Water

Lab Sample ID: 680-146390-7

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			505503	12/07/17 16:48	AJR	TAL SAV
Dissolved	Analysis	6010C		1	506043	12/12/17 03:59	BWR	TAL SAV
Dissolved	Analysis	415.1-1974		1	506528	12/13/17 13:51	KLD	TAL SAV

#### Client Sample ID: 4Q17Trip Blank #1 Date Collected: 12/04/17 00:00 Date Received: 12/06/17 09:20

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	505810	12/10/17 18:52	UI	TAL SAV

#### Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401 TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

SJD 2/13/18

TestAmerica Savannah

		681-Atlanta	nta						681-Atlanta	lanta	THE LEADER IN ENVIRONMENTAL TESTING TestAmerica I shorefories Inc	ENTAL TESTIN
savannah, 58.31404 Phone: 912.354.785\$ Fax:	Regulatory Program:	::		NPDES	RCRA	Other:						TAL-8210 (0713)
	Project Manager: And	4	Derluke	Site	Site Contact: 5.	C	Dillerso		2		$\left  \right $	
/ Name: Golder Associates	TellFax: 636-724-	124-9191		La.	Lab Contact:		Millele	CovCarrier:	T	red 6 x	10	cocs
Address. 820 5 Mix X #100 Clivisiate/21n & 11. 11. 10 22301	CALENDAR DAYS	Turnai	vound Time	Τ	201	287	5	, >			For Lab Use Only:	
Phone: (34-724-9141	TAT if different	I from Be	budderd		09 P (N 1	1'0/C		0199			Walk-in Client:	
Project Name: 4217 LTM Cow Supering-1403348 Sile: Solution Werkrummith Facility	socc	2 days 1 days		The state of the s	228 A) OSW/1	12:528	225E	('SIA form	1.00		Job / SDG No.:	
	Sample Sample Date Time	e Sample Type (CaComp, GeGrab)	Matrix	Cont Filtered Sar	VOC S	27 1977 7/ AV	721	-	704		Sample Specific Notes:	Notes:
	12/4/17 1300	-	3	エン	231	-	2 2	~				
- F(0, L) - 1217	7	-	-	ΥY				64				
ESL-MW-D1-1217	1405			y N	131	111	3 2 3	3		-		
~	7	-		YY								
C12-20-20-20	1515	_		14 N	3-	-	3 2	54				
~	T T			4 4				12	3			
ATCip Black # I		-	_	2 2	21							
A												
											In the many second seco	
				+	-		+	-	680-146	680-146390 Chain C		
Preservation Used: 1= Ice. 2= HC; 3= H2SO4: 4=HNO3: 5=NaOH; 6= Other	=NaOH: 6= Other			-						-		
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please Commerts Section if the lab is to discose of the sample	Please List any EPA Waste Coo	te Cod	es for the sample in the	1	Sample D	isposal (	A fee m	ay be a	Sample Disposal ( A fee may be assessed if	samples are r	samples are retained longer than 1 month)	
Non-Hazard Flammable Skin fritant	Pason B	Unknawn	awn		Return	Return to Client		Dispe	Disposal by Lab	Archive for	ve for Months	
Special Instructions/QC Requirements & Comments:					2.50	CP-C	C.S	:)2.	0			
🗌 Yes 🗐 No	Custody Seat No.:					Cooler Tu	Cooler Temp. (°C): Obs'd	): Obs'd		Corr'd:	Therm ID No.:	
	Company		Date/Time	Oct /	Received by	þý			Corr	Company:	Date/Time:	
by:	Company:		Date/Time		Received by	by:			Con	Company:	Date/Time:	
Relinquished by:	Company:		Date/Time.	1	Received in Laboratery	din Laborat	North I	0	Y Co	Company:	DaterTime:	W250
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680-146390 Chain of Custody

TestAmerica

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Cooler/Sample Receipt and Temperature Log Form

Client Information								
Client: TA- Savannah								
City/State: Suranah STATE	Project:							
Receipt Information	N.F. ILL IS LAND CONTRACTOR							
Date/Time Received: 12/23/17 1005	Received By: MRH							
Delivery Type: UPS X FedEx Del	FedEx Ground US Mail Spee-Dee							
TA Courier TA Field Services	Client Drop-off Other:							
Condition of Cooler/Containers	· 第二、 · · · · · · · · · · · · · · · · · · ·							
Sample(s) received in Cooler? 🔣 Yes 🗌 No	If yes: Cooler ID:							
Multiple Coolers? Yes 🕅 No	If yes: Cooler # of							
Cooler Custody Seals Present? X Yes X No D/2	f yes: Cooler custody seals intact? 🕅 Yes 🗌 No							
Sample Custody Seals Present? Yes 🕅 No	If yes: Sample custody seals intact? Yes No							
Trip Blank Present? Yes 🕅 No	If yes: Which VOA samples are in cooler? 1							
Temperature Record	·····································							
Coolant: Wet ice 🗌 Blue ice 🗌 Dry ice	Other: NONE							
·								
Thermometer ID: J	Correction Factor (°C): +0.							
J     Temp Blank Temperature – If no temp blank, or temp blank temp	Correction Factor (°C): +O, ( erature above criteria, proceed to Sample Container Temperature 7%							
• Temp Blank Temperature – If no temp blank, or temp blank temp Uncorrected Temp (°C): Ú. J	Correction Factor (°C): +0, erature above criteria, proceed to Sample Container Temperature 7% Corrected Temp (°C): 0, 4							
• Temp Blank Temperature – If no temp blank, or temp blank temp Uncorrected Temp (°C): 0.3 • Sample Container Temperature	Correction Factor (°C): +0, erature above criteria, proceed to Sample Container Temperature 7% Corrected Temp (°C): 0, 4							
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<ul> <li>Temp Blank Temperature – If no temp blank, or temp blank temp Uncorrected Temp (°C): Sample Container Temperature Sample ID(s) &amp; bottle type used: Uncorrected Temp (°C): Exceptions Noted Sample IC(s) = TEMP 2</li> <li>Exceptions Noted Sample container temperature exceeds criteria, was sample(s) rece a) If yes: Is there evidence that the chilling process If temperature is &lt;0°C, are there obvious signs that (e.g., bulging septa, broken/cracked bottles?)</li> </ul>	Correction Factor (°C):       +O, (         erature above criteria, proceed to Sample Container Temperature 7.5         Corrected Temp (°C):       O, 4         CONTAINER 2         Corrected Temp (°C):       TEMP 1         Corrected Temp (°C):       TEMP 1         Ves       No         ss began?       Yes         Yes       No         the integrity of sample containers is compromised?         Yes       No							
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TestAmerica-Cedar Falls Page 33 of 38 General temperature criteria is 0 to 6°C Bacteria temperature criteria is 0 to 10°C S JD 2//3 / 8

Sevenuel, GA 31404       From (612) 334-7858 Fax (912) 352-0165       Pinome (612) 334-7858 Fax (912) 352-0165       Shipping/Receiving       Enterprise       Demonstration       Shipping/Receiving       Constract       Demonstration       Called Fells       Sample       Demonstration       Called Fells       Demonstration       Demo	0.00.1000       0.00.1000       0.00<		TestAmerica Savannah 5102 LaRoche Avenue	Chain of	Chain of Custodv Record	Record				TestAr	TestAmerica
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State Single         State Single<	Strate Area		cliy Cedar Falls	TAT Requested (days):							- None - AsNBOZ
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	A No					Cooler Tempe	rature(s) <sup>a</sup> C and Other Re	smerke			

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#### Login Sample Receipt Checklist

Client: Solutia Inc.

#### Login Number: 146390 List Number: 1

#### Creator: Edwards, Jessica R

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 680-146390-1 SDG Number: KPS205

List Source: TestAmerica Savannah



#### Login Sample Receipt Checklist

Client: Solutia Inc.

#### Login Number: 146390 List Number: 2

Creator: Hummel, Matt R

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 680-146390-1 SDG Number: KPS205

List Source: TestAmerica Cedar Falls

List Creation: 12/23/17 10:40 AM

#### **Accreditation/Certification Summary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

#### TestAmerica Job ID: 680-146390-1 SDG: KPS205

#### Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	AFCEE	EPA Region	Identification Number SAVLAB	Expiration Date
labama	State Program	4	41450	06-30-18
laska	State Program	10		06-30-18
Alaska (UST)	State Program	10	UST-104	09-22-19
Arizona	State Program	9	AZ0808	12-14-18
Arkansas DEQ	State Program	6	88-0692	02-01-19
California	State Program	9	2939	06-30-18
Colorado	State Program	8	N/A	12-31-18
Connecticut	State Program	1	PH-0161	03-31-19
Iorida	NELAP	4	E87052	06-30-18
A Dept. of Agriculture	State Program	4	N/A	06-12-18
Georgia	State Program	4	803	06-30-18
Guam	State Program	9	15-005r	04-16-18
ławaii	State Program	9	N/A	06-30-18
llinois	NELAP	5	200022	11-30-18
ndiana	State Program	5	N/A	06-30-18
owa	State Program	7	353	06-30-19
Kentucky (DW)	State Program	4	90084	12-31-18
(entucky (UST)	State Program	4	18	06-30-18
Kentucky (WW)	State Program	4	90084	12-31-18 *
А-В	DoD ELAP	·	L2463	09-22-19
-A-B	ISO/IEC 17025		L2463.01	09-22-19
ouisiana	NELAP	6	30690	06-30-18
ouisiana (DW)	NELAP	6	LA160019	12-31-18
laine	State Program	1	GA00006	09-24-18
laryland	State Program	3	250	12-31-18
lassachusetts	State Program	1	M-GA006	06-30-18
/ichigan	State Program	5	9925	06-30-18
lississippi	State Program	4	N/A	06-30-18
lebraska	State Program	7	TestAmerica-Savannah	06-30-18
lew Jersey	NELAP	2	GA769	06-30-18
lew Mexico	State Program	6	N/A	06-30-18
lew York	NELAP	2	10842	03-31-18
North Carolina (DW)	State Program	4	13701	07-31-18
North Carolina (WW/SW)	State Program	4	269	12-31-18
Oklahoma	State Program	6	9984	08-31-18
Pennsylvania	NELAP	3	68-00474	06-30-18
Puerto Rico	State Program	2	GA00006	12-31-18
outh Carolina	State Program	4	98001	06-30-18
Fennessee	State Program	4	TN02961	06-30-18
exas	NELAP	6	T104704185-16-9	11-30-18
exas	State Program	6	T104704185	06-30-18
IS Fish & Wildlife	Federal	Ť	LE058448-0	07-31-18
ISDA	Federal		SAV 3-04	06-14-20 *
/irginia	NELAP	3	460161	06-14-18
Nashington	State Program	10	C805	06-10-18
West Virginia (DW)	State Program	3	9950C	12-31-18
West Virginia DEP	State Program	3	094	06-30-18
Wisconsin	State Program	5	999819810	08-31-18
Nyoming	State Program	8	8TMS-L	06-30-16 *

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Savannah 33D 2/13/18

#### **Accreditation/Certification Summary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

#### TestAmerica Job ID: 680-146390-1 SDG: KPS205

#### Laboratory: TestAmerica Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	IHLAP		101044	11-01-18
Georgia	State Program	4	IA100001 (OR)	09-29-18
Illinois	NELAP	5	200024	11-29-18
lowa	State Program	7	007	12-01-17 *
Minnesota	NELAP	5	019-999-319	12-31-18
Minnesota (Petrofund)	State Program	1	3349	08-22-18
North Dakota	State Program	8	R-186	09-29-18
Oregon	NELAP	10	IA100001	09-29-18

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.



35D 2/13/18



#### Level IV Data Validation Summary Solutia Inc., W.G. Krummrich, Sauget, Illinois 4Q17 Long-Term Monitoring Program

Company Name: <u>Golder Associates</u> Project Name: <u>WGK-4Q17 LTM</u> Reviewer: <u>S. DiCenso</u> Laboratory: <u>TestAmerica</u> SDG#: <u>KPS206</u> Matrix: Water Project Manager: <u>A. Derhake</u> Project Number: <u>140-3345</u> Sample Date: <u>December 2017</u>

Analytical Method: VOC (8260B), Dissolved Gases (RSK-175), Metals (6010C), Alkalinity (SM 2320B), Carbon Dioxide (SM 4500 CO2C), Chloride (325.2), Nitrogen, Nitrate-Nitrite (353.2), Sulfate (375.4), TOC (415.1), and DOC (415.1)

Sample Names: <u>GWE-3D-1217</u>, <u>GWE-3D-F(0.2)-1217</u>, <u>GWE-2D-1217</u>, <u>GWE-2D-F(0.2)-1217</u>, <u>CPA-MW-5D-1217</u>, <u>CPA-MW-5D-1217</u>, <u>CPA-MW-5D-1217</u>, <u>BSA-MW-5D-1217</u>, <u>BSA-MW-5D-F(0.2)-1217</u>, <u>CPA-MW-4D-1217</u>, <u>CPA-MW-4D-F(0.2)-1217</u>, <u>4Q17</u> LTM Trip Blank #2

Field Information		YES	NO	NA
a)	Sampling dates noted?	$\boxtimes$		
b)	Does the laboratory narrative indicate deficiencies?	$\boxtimes$		

#### Comments:

VOC: Samples GWE-3D and CPA-MW-5D required dilution prior to analysis, reporting limits were adjusted accordingly.

Dissolved Gases: No deficiencies noted.

Metals: No deficiencies noted.

Alkalinity: No deficiencies noted.

**Chloride:** Samples GWE-3D, GWE-2D, CPA-MW-5D, and CPA-MW-4D required dilution prior to analysis, reporting limits were adjusted accordingly.

Nitrate-Nitrite as Nitrogen: No deficiencies noted.

Sulfate: Samples GWE-3D, GWE-2D, and CPA-MW-5D required dilution prior to analysis, reporting limits were adjusted accordingly.

TOC: No deficiencies noted.

DOC: No deficiencies noted.

Free Carbon Dioxide: No deficiencies noted.

#### Chain-of-Custody (COC)

- a) Was the COC signed by both field and laboratory personnel?
- b) Were samples received in good condition?

**Comments:** <u>Samples were received at 2.0°C and 4.7°C</u>, within the 0°C to 6°C criteria.

YES	NO	NA
$\boxtimes$		
$\boxtimes$		



Fe	bruary 2018 2	2 140	-3345
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General		YES	NO	NA
a)	Were hold times met for sample analysis?		$\boxtimes$	
b)	Were the correct preservatives used?	$\boxtimes$		
c)	Was the correct method used?		$\boxtimes$	
d)	Any sample dilutions noted?	$\boxtimes$		

**Comments:** <u>Due to instrument failure, samples were sent to an alternate lab and were analyzed under a different method for</u> <u>alkalinity (SM 2320B) and free carbon dioxide (SM 4500 CO2C).</u> The instrument failure and sample re-shipment resulted in alkalinity, <u>carbon dioxide, and nitrate analyzed outside of hold time.</u>

Detections in diluted analysis were qualified.

GC/N	IS Instrument Performance Check (IPC) and Internal Standards (IS)	YES	NO	NA
a)	IPC analyzed at the appropriate frequency and met the appropriate standards?	$\boxtimes$		
b)	Does BFB/DFTPP meet the ion abundance criteria?	$\boxtimes$		
c)	Internal Standard retention times and areas met appropriate criteria?	$\boxtimes$		
Co	mments: None.			
Calib	rations	YES	NO	NA
a)	Initial calibration analyzed at the appropriate frequency and met the appropriate standards?	$\boxtimes$		
b)	Continuing calibrations analyzed at the appropriate frequency and met the appropriate standards	s?		
		$\bowtie$		
c)	Initial calibration verifications and blanks analyzed at the appropriate frequency and met the app	ropriate	stand	lards?
			$\boxtimes$	
d)	Continuing calibration verifications and blanks analyzed at the appropriate frequency and met the	e approj	oriate	standards?
			$\boxtimes$	
Co	mments: Some compounds did not meet calibration requirements; however, calibration criteria w	ere met	by an	alytes of interest
No	data qualification was required.			
Blanl	ks	YES	NO	NA
a)	Were blanks (trip, equipment, method) performed at required frequency?	$\bowtie$		
b)	Were analytes detected in any blanks?		$\boxtimes$	
Co	mments: None.			
Matri	x Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA
a)	Was MS/MSD accuracy criteria met?	$\boxtimes$		
b)	Was MS/MSD precision criteria met?	$\boxtimes$		
Co	mments: None.			
Labo	ratory Control Sample (LCS)	YES	NO	NA
a)	LCS analyzed at the appropriate frequency and met appropriate standards?	$\boxtimes$		
Co	mments: None.			



		February 2018	3			140-3345
Surrogate (System Monitoring) Compounds				YES	NO	NA
a) Surrogate compounds analyzed at the appropriate frequency and met appropriate standards?						

NA
$\bowtie$
$\boxtimes$

Comments: None.

#### Additional Comments: None.

#### **Qualifications:**

Quality Control Issue	Compound(s)	Qualifier	Samples Affected
Compounds analyzed at a dilution	Chlorobenzene, 1,4-Dichlorobenzene, Chloride, and Sulfate	D	GWE-2D, GWE-3D, BSA-MW-5D, CPA-MW-4D, CPA-MW-5D
Analyzed outside of hold time	Alkalinity and Carbon Dioxide, Free	J	GWE-2D, GWE-3D, BSA-MW-5D, CPA-MW-4D, CPA-MW-5D
Analyzed outside of hold time; compound not detected	Nitrate	IJ	GWE-2D, GWE-3D, BSA-MW-5D, CPA-MW-4D, CPA-MW-5D



#### SDG KPS206

Sample Results from:

GWE-2D GWE-3D BSA-MW-5D CPA-MW-4D CPA-MW-5D

## **TestAmerica**

#### THE LEADER IN ENVIRONMENTAL TESTING

## **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc. TestAmerica Savannah 5102 LaRoche Avenue Savannah, GA 31404 Tel: (912)354-7858

TestAmerica Job ID: 680-146392-1 TestAmerica Sample Delivery Group: KPS206 Client Project/Site: 4Q17 LTM GW Sampling - 1403345 Revision: 4

For: Solutia Inc. 575 Maryville Centre Dr. Saint Louis, Missouri 63141

Attn: Mr. Jerry Rinaldi

Michule R.Kensey

Authorized for release by: 2/20/2018 3:59:38 PM Michele Kersey, Project Manager II (912)354-7858 michele.kersey@testamericainc.com



The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

..... LINKS **Review your project** results through Total Access Have a Question? Ask-The Expert Visit us at: www.testamericainc.com

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Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345 TestAmerica Job ID: 680-146392-1 SDG: KPS206

#### Job ID: 680-146392-1

#### Laboratory: TestAmerica Savannah

Narrative

#### CASE NARRATIVE

**Client: Solutia Inc.** 

#### Project: 4Q17 LTM GW Sampling - 1403345

#### Report Number: 680-146392-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

#### RECEIPT

The samples were received on 12/6/2017 9:20 AM and 12/15/2017 5:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.0° C and 4.7° C.

Report revised 2/8/18 and 2/12/18 to correct sample IDs. Report revised 2/19/18 to correct narrative. Report revised 02/20/18 to correct SDG to KPS206.

#### **Receipt Exceptions**

The container label for the following samples did not match the information listed on the Chain-of-Custody (COC): GWE-3D-1217 (680-146392-1), GWE-3D-F(0.2)-1217 (680-146392-2), GWE-2D-1217 (680-146392-3), GWE-2D-F(0.2)-1217 (680-146392-4), CPA-MW-5D-1217 (680-146392-5), CPA-MW-5D-F(0.2)-1217 (680-146392-6), BSA-MW-5D-1217 (680-146392-7), BSA-MW-5D-1217 (680-146392-7][MS]), BSA-MW-5D-1217 (680-146392-7][MSD]), BSA-MW-5D-F(0.2)-1217 (680-146392-8), 47Q17 Trip Blank #2 (680-146392-9), CPA-MW-4D-1217 (680-146392-10) and CPA-MW-4D-F(0.2)-1217 (680-146392-11). The container labels list CPA-MW-4D-1217/CPA-MW-4D-F(0.2)-1217, while the COC lists BSA-MW-4D-1217/BSA-MW-4D-F(0.2)-1217. The client was contacted, and the lab was instructed to log in per container labels. The sample times match the containers.

#### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples GWE-3D-1217 (680-146392-1), GWE-2D-1217 (680-146392-3), CPA-MW-5D-1217 (680-146392-5), BSA-MW-5D-1217 (680-146392-7), 47Q17 Trip Blank #2 (680-146392-9) and CPA-MW-4D-1217 (680-146392-10) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 12/11/2017.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 680-505810.

Samples GWE-3D-1217 (680-146972-1)[20X] and CPA-MW-5D-1217 (680-146972-5)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **DISSOLVED GASES**

Samples GWE-3D-1217 (680-146972-1), GWE-2D-1217 (680-146972-2), CPA-MW-5D-1217 (680-146972-3), CPA-MW-5D-1217 (680-146972-4) and CPA-MW-4D-1217 (680-146972-5) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 12/19/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

55D 2/14/18 **TestAmerica Savannah** 

#### Job ID: 680-146392-1 (Continued)

#### Laboratory: TestAmerica Savannah (Continued)

#### METALS (ICP) - DISSOLVED

Samples GWE-3D-F(0.2)-1217 (680-146392-2), GWE-2D-F(0.2)-1217 (680-146392-4), CPA-MW-5D-F(0.2)-1217 (680-146392-6), BSA-MW-5D-F(0.2)-1217 (680-146392-8) and CPA-MW-4D-F(0.2)-1217 (680-146392-11) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 12/11/2017 and analyzed on 12/12/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### METALS (ICP)

Samples GWE-3D-1217 (680-146972-1), GWE-2D-1217 (680-146972-2), CPA-MW-5D-1217 (680-146972-3), CPA-MW-5D-1217 (680-146972-4) and CPA-MW-4D-1217 (680-146972-5) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 12/28/2017 and analyzed on 12/29/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### ALKALINITY

Samples GWE-3D-1217 (680-146972-1), GWE-2D-1217 (680-146972-2), CPA-MW-5D-1217 (680-146972-3), CPA-MW-5D-1217 (680-146972-4) and CPA-MW-4D-1217 (680-146972-5) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 12/26/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **CHLORIDE**

Samples GWE-3D-1217 (680-146972-1), GWE-2D-1217 (680-146972-2), CPA-MW-5D-1217 (680-146972-3), CPA-MW-5D-1217 (680-146972-4) and CPA-MW-4D-1217 (680-146972-5) were analyzed for Chloride in accordance with EPA Method 325.2. The samples were analyzed on 12/21/2017.

Samples GWE-3D-1217 (680-146972-1)[50X], GWE-2D-1217 (680-146972-2)[20X], CPA-MW-5D-1217 (680-146972-3)[5X], CPA-MW-5D-1217 (680-146972-4)[5X] and CPA-MW-4D-1217 (680-146972-5)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### NITRATE-NITRITE AS NITROGEN

Samples GWE-3D-1217 (680-146972-1), GWE-2D-1217 (680-146972-2), CPA-MW-5D-1217 (680-146972-3), CPA-MW-5D-1217 (680-146972-4) and CPA-MW-4D-1217 (680-146972-5) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 12/19/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### SULFATE

Samples GWE-3D-1217 (680-146972-1), GWE-2D-1217 (680-146972-2), CPA-MW-5D-1217 (680-146972-3), CPA-MW-5D-1217 (680-146972-4) and CPA-MW-4D-1217 (680-146972-5) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 12/21/2017.

Samples GWE-3D-1217 (680-146972-1)[20X], GWE-2D-1217 (680-146972-2)[50X] and CPA-MW-5D-1217 (680-146972-3)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **TOTAL ORGANIC CARBON**

Samples GWE-3D-1217 (680-146972-1), GWE-2D-1217 (680-146972-2), CPA-MW-5D-1217 (680-146972-3), CPA-MW-5D-1217 (680-146972-4) and CPA-MW-4D-1217 (680-146972-5) were analyzed for total organic carbon in accordance with EPA Method 415.1. The samples were analyzed on 12/20/2017.

35D 2/14/18

#### Job ID: 680-146392-1 (Continued)

#### Laboratory: TestAmerica Savannah (Continued)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **DISSOLVED ORGANIC CARBON (DOC)**

Samples GWE-3D-F(0.2)-1217 (680-146392-2), GWE-2D-F(0.2)-1217 (680-146392-4), CPA-MW-5D-F(0.2)-1217 (680-146392-6), BSA-MW-5D-F(0.2)-1217 (680-146392-8) and CPA-MW-4D-F(0.2)-1217 (680-146392-11) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 12/13/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### FREE CARBON DIOXIDE

Samples GWE-3D-1217 (680-146972-1), GWE-2D-1217 (680-146972-2), CPA-MW-5D-1217 (680-146972-3), CPA-MW-5D-1217 (680-146972-4) and CPA-MW-4D-1217 (680-146972-5) were analyzed for free carbon dioxide in accordance with SM 4500 CO2 C. The samples were analyzed on 12/26/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

3 4 5 6 7 8 9 10 11 12 13

500 2/14/18 TestAmerica Savannah

### Sample Summary

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

Lab Sample ID	Client Sample ID	Matrix	Collected Receive
680-146392-1	GWE-3D-1217	Water	12/05/17 09:27 12/06/17 09
680-146392-2	GWE-3D-F(0.2)-1217	Water	12/05/17 09:27 12/06/17 09
680-146392-3	GWE-2D-1217	Water	12/05/17 11:00 12/06/17 09
580-146392-4	GWE-2D-F(0.2)-1217	Water	12/05/17 11:00 12/06/17 09
80-146392-5	CPA-MW-5D-1217	Water	12/05/17 12:20 12/06/17 09
80-146392-6	CPA-MW-5D-F(0.2)-1217	Water	12/05/17 12:20 12/06/17 09
680-146392-7	BSA-MW-5D-1217	Water	12/05/17 13:50 12/06/17 09
80-146392-8	BSA-MW-5D-F(0.2)-1217	Water	12/05/17 13:50 12/06/17 09
680-146392-9	47Q17 Trip Blank #2	Water	12/05/17 00:00 12/06/17 09
680-146392-10	CPA-MW-4D-1217	Water	12/05/17 15:25 12/06/17 0
680-146392-11	CPA-MW-4D-F(0.2)-1217	Water	12/05/17 15:25 12/06/17 0
680-146972-1	GWE-3D-1217	Water	12/05/17 09:27 12/15/17 1
580-146972-2	GWE-2D-1217	Water	12/05/17 11:00 12/15/17 1
680-146972-3	CPA-MW-5D-1217	Water	12/05/17 12:20 12/15/17 1
680-146972-4	CPA-MW-5D-1217	Water	12/05/17 13:50 12/15/17 1
680-146972-5	CPA-MW-4D-1217	Water	12/05/17 15:25 12/15/17 1

3 4 5 6 7 8 9 10 11 12 13 14 15

### **Method Summary**

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146392-1 SDG: KPS206

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
RSK-175	Dissolved Gases (GC)	RSK	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
325.2-1978	Chloride	MCAWW	TAL SAV
353.2-1993 R2.0	Nitrogen, Nitrate-Nitrite	MCAWW	TAL SAV
375.4-1978	Sulfate	MCAWW	TAL SAV
415.1-1974	DOC	MCAWW	TAL SAV
415.1-1974	TOC	MCAWW	TAL SAV
SM 2320B	Alkalinity	SM	TAL CF
SM 4500 CO2 C	Free Carbon Dioxide	SM	TAL CF

#### **Protocol References:**

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

SJD 2/14/1/8 TestAmerica Savannah

### **Definitions/Glossary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

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12 13

#### Qualifiers

GC/MS VO	Α
Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
GC VOA	
Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
Metals	
Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
General C	hemistry
Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
Н	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)



### **Detection Summary**

Client: Solutia Inc.
Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146392-1 SDG: KPS206

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Prep Type
Chlorobenzene	1700	D	20		ug/L	20	8260B	Total/NA
1,4-Dichlorobenzene	150	$\mathcal{P}$	20		ug/L	20	8260B	Total/NA
lient Sample ID: GWE-3	3D-F(0.2)-12	217				Lab Sa	mple ID: 68	0-146392-
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Ргер Туре
Iron, Dissolved	27		0.050		mg/L	1	6010C	Dissolved
Manganese, Dissolved	0.82		0.010		mg/L	1	6010C	Dissolved
Dissolved Organic Carbon	6.9		1.0		mg/L	1	415.1-1974	Dissolved
lient Sample ID: GWE-2	2D-1217					Lab Sa	mple ID: 68	0-146392-
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Ргер Туре
Chlorobenzene	89		1.0		ug/L	1	8260B	Total/NA
1,2-Dichlorobenzene	1.5		1.0		ug/L	1	8260B	Total/NA
1,4-Dichlorobenzene	1.4		1.0		ug/L	1	8260B	Total/NA
lient Sample ID: GWE-2	2D-F(0.2)-12	217				Lab Sa	mple ID: 68	0-146392-
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Ргер Туре
Iron, Dissolved	18		0.050		mg/L	1	6010C	Dissolved
Manganese, Dissolved	0.44		0.010		mg/L	1	6010C	Dissolved
Dissolved Organic Carbon	4.2		1.0		mg/L	1	415.1-1974	Dissolved
lient Sample ID: CPA-N	IW-5D-1217	7				Lab Sa	mple ID: 68	0-146392-
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Ргер Туре
Chlorobenzene	1800	$\nabla$	20		ug/L	20	8260B	Total/NA
lient Sample ID: CPA-N	/W-5D-F(0.2	2)-1217				Lab Sa	mple ID: 68	0-146392-
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Ргер Туре
Iron, Dissolved	16		0.050		mg/L	1	6010C	Dissolved
Manganese, Dissolved	0.66		0.010		mg/L	1	6010C	Dissolved
Dissolved Organic Carbon	5.4		1.0		mg/L	1	415.1-1974	Dissolved
lient Sample ID: BSA-N	IW-5D-1217	7				Lab Sa	mple ID: 68	0-146392-
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Ргер Туре
Chlorobenzene	100		1.0	6	ug/L	1	8260B	Total/NA
Client Sample ID: BSA-N	/IW-5D-F(0.2	2)-1217				Lab Sa	ample ID: 68	80-146392-
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Ргер Туре
Iron, Dissolved	12		0.050		mg/L	1	6010C	Dissolved
	0.26		0.010		mg/L	1	6010C	Dissolved
Manganese, Dissolved Dissolved Organic Carbon	0.20		1.0		-			

### Client Sample ID: 47Q17 Trip Blank #2

No Detections.

This Detection Summary does not include radiochemical test results.



### **Detection Summary**

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146392-1 SDG: KPS206

6010C

415.1-1974

Lab Sample ID: 680-146972-1

1

1

Dissolved

Dissolved

Client Sample ID: CPA	ient Sample ID: CPA-MW-4D-1217						Lab Sample ID: 680-146392-7				
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type		
Chlorobenzene	140		1.0		ug/L	1	_	8260B	Total/NA		
1,4-Dichlorobenzene	2.2		1.0		ug/L	1		8260B	Total/NA		
Client Sample ID: CPA	-MW-4D-F(0.2	2)-1217				Lab Sa	mp	ole ID: 68	0-146392-11		
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type		
Iron, Dissolved	15		0.050		mg/L	1	_	6010C	Dissolved		

0.010

1.0

mg/L

mg/L

0.41

7.5

#### Client Sample ID: GWE-3D-1217

Manganese, Dissolved

**Dissolved Organic Carbon** 

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Methane	79		0.58		ug/L	1	_	RSK-175	Total/NA
Iron	28		0.050		mg/L	1		6010C	Total Recoverable
Manganese	0.86		0.010		mg/L	1		6010C	Total Recoverable
Chloride	1500		50		mg/L	50		325.2-1978	Total/NA
Sulfate	380	$\mathcal{P}$	100		mg/L	20		375.4-1978	Total/NA
Total Organic Carbon	6.7		1.0		mg/L	1		415.1-1974	Total/NA
Alkalinity as CaCO3	450	КIJ	5.0		mg/L	1		SM 2320B	Total/NA
Carbon Dioxide, Free	89	HFJ	5.0		mg/L	1		SM 4500 CO2 C	Total/NA

### Client Sample ID: GWE-2D-1217

#### Lab Sample ID: 680-146972-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Methane	12		0.58		ug/L	1	_	RSK-175	Total/NA
Iron	18		0.050		mg/L	1		6010C	Total
Manganese	0.42		0.010		mg/L	1		6010C	Recoverable Total
Chloride	640	D	20		mg/L	20		325.2-1978	Recoverable Total/NA
Sulfate	730	P	250		mg/L	50		375.4-1978	Total/NA
Total Organic Carbon	3.7		1.0		mg/L	1		415.1-1974	Total/NA
Alkalinity as CaCO3		x J	5.0		mg/L	1		SM 2320B	Total/NA
Carbon Dioxide, Free	57	HFJ	5.0		mg/L	1		SM 4500 CO2 C	Total/NA

#### Client Sample ID: CPA-MW-5D-1217

#### Lab Sample ID: 680-146972-3

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Methane	87	0.58	ug/L	<u> </u>	RSK-175	Total/NA
Iron	17	0.050	mg/L	່ 1	6010C	Total
Manganese	0.66	0.010	mg/L	1	6010C	Recoverable Total Recoverable
Chloride	200 🏱	5.0	mg/L	5	325.2-1978	Total/NA
Sulfate	40 🖓	25	mg/L	5	375.4-1978	Total/NA
Total Organic Carbon	5.2	1.0	mg/L	1	415.1-1974	Total/NA
Alkalinity as CaCO3	600 H 3	5.0	mg/L	1	SM 2320B	Total/NA
Carbon Dioxide, Free	110 JHF 🍏	5.0	mg/L	1	SM 4500 CO2 C	Total/NA

This Detection Summary does not include radiochemical test results.



4 5 6 7 8 9 10

### **Detection Summary**

TestAmerica Job ID: 680-146392-1 SDG: KPS206

### Client Sample ID: CPA-MW-5D-1217

Lab Sample ID: 680-146972-4

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	D Method	Ргер Туре
Ethane	9.2	1.1		ug/L	1	RSK-175	Total/NA
Methane (TCD)	5900	390		ug/L	1	RSK-175	Total/NA
Iron	12	0.050		mg/L	1	6010C	Total
Manganese	0.26	0.010		mg/L	1	6010C	Recoverable Total Recoverable
Chloride	170 꾿	5.0		mg/L	5	325.2-1978	Total/NA
Total Organic Carbon	7.8	1.0		mg/L	1	415.1-1974	Total/NA
Alkalinity as CaCO3	580 H ブ	5.0		mg/L	1	SM 2320B	Total/NA
Carbon Dioxide, Free	67 HF J	5.0		mg/L	1	SM 4500 CO2 C	Total/NA

### Client Sample ID: CPA-MW-4D-1217

Lab Sample ID: 680-146972-5

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethane	7.8	1.1		ug/L	1	_	RSK-175	Total/NA
Methane (TCD)	11000	390		ug/L	1		RSK-175	Total/NA
Iron	15	0.050		mg/L	1		6010C	Total
Manganese	0.41	0.010		mg/L	1		6010C	Recoverable Total Recoverable
Chloride	210 잗	5.0		mg/L	5		325.2-1978	Total/NA
Total Organic Carbon	7.4	1.0		mg/L	1		415.1-1974	Total/NA
Alkalinity as CaCO3	610 🖌 🏅	5.0		mg/L	1		SM 2320B	Total/NA
Carbon Dioxide, Free	78 HF 🔿	5.0		mg/L	1		SM 4500 CO2 C	Total/NA

This Detection Summary does not include radiochemical test results.

5502/14/18 TestAmerica Savannah

TestAmerica Job ID: 680-146392-1 SDG: KPS206

Analyzed

12/11/17 19:46

12/11/17 19:46

12/11/17 19:46

12/11/17 19:46

12/11/17 19:46

Analyzed

12/11/17 19:46

12/11/17 19:46

12/11/17 19:46

12/11/17 19:46

#### Client Sample ID: GWE-3D-1217 Date Collected: 12/05/17 09:27

Date Received: 12/06/17 09:20

#### Lab Sample ID: 680-146392-1 Matrix: Water

Prepared

#### Method: 8260B - Volatile Organic Compounds (GC/MS) Analyte Result Qualifier RL MDL Unit D Prepared Benzene 20 U 20 ug/L 1700 Ď Chlorobenzene 20 ug/L 1,2-Dichlorobenzene 20 U 20 ug/L 1,3-Dichlorobenzene 20 U 20 ug/L 150 Ď 1,4-Dichlorobenzene 20 ug/L

		-	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	98		80 - 120
1,2-Dichloroethane-d4 (Surr)	90		73 - 131
Dibromofluoromethane (Surr)	97		80 - 122
4-Bromofluorobenzene (Surr)	97		80 - 120

Dil Fac

20

20

20

20

20

20

20

20

20

Dil Fac



Client: Solutia Inc.
Project/Site: 4Q17 LTM GW Sampling - 1403345

Client Sample ID: GWE-3I Date Collected: 12/05/17 09:27 Date Received: 12/06/17 09:20		ĩ	Lab Sample ID: 680-146392 Matrix: Wat					
Method: 6010C - Metals (ICP)	- Dissolved Result Qualifier	RL	MDL	Unit	D	Prepared	Analvzed	Dil Fac
Iron, Dissolved	27	0.050		mg/L		12/11/17 17:28	12/12/17 18:59	1
Manganese, Dissolved	0.82	0.010		mg/L		12/11/17 17:28	12/12/17 18:59	1
General Chemistry - Dissolve Analyte	ed Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	6.9	1.0		mg/L			12/13/17 14:08	1

55D 2/14/18 TestAmerica Savannah

TestAmerica Job ID: 680-146392-1 SDG: KPS206

# Client Sample ID: GWE-2D-1217 Lab Sample ID: 680-146392-3 Date Collected: 12/05/17 11:00 Matrix: Water Date Received: 12/06/17 09:20 Matrix: Water

Method: 8260B - Volatile O	rganic Compo	unds (GC/	MS)						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/11/17 20:11	1
Chlorobenzene	89		1.0		ug/L			12/11/17 20:11	1
1,2-Dichlorobenzene	1.5		1.0		ug/L			12/11/17 20:11	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 20:11	1
1,4-Dichlorobenzene	1.4		1.0		ug/L			12/11/17 20:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		80 - 120					12/11/17 20:11	1
1,2-Dichloroethane-d4 (Surr)	81		73 - 131					12/11/17 20:11	1
Dibromofluoromethane (Surr)	93		80 - 122					12/11/17 20:11	1
4-Bromofluorobenzene (Surr)	99		80 - 120					12/11/17 20:11	1

4 5 7 8 9 10 11 12 13 14

SJD 2/14/18

TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 4Q17 LTM GW Sampling - 1403345

Client Sample ID: GWE-2 Date Collected: 12/05/17 11:00 Date Received: 12/06/17 09:20		0	Lab Sample ID: 680-146392 Matrix: Wat					
Method: 6010C - Metals (ICP) Analyte	- Dissolved Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	18	0.050		mg/L		12/11/17 17:28	12/12/17 18:23	1
Manganese, Dissolved	0.44	0.010		mg/L		12/11/17 17:28	12/12/17 18:23	1
General Chemistry - Dissolve Analyte	ed Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	4.2	1.0		mg/L			12/13/17 14:24	1

550 2/14/18 TestAmerica Savannah

TestAmerica Job ID: 680-146392-1 SDG: KPS206

#### Client Sample ID: CPA-MW-5D-1217 Date Collected: 12/05/17 12:20 Date Received: 12/06/17 09:20

#### Lab Sample ID: 680-146392-5 Matrix: Water

### Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	20	U	20		ug/L			12/11/17 20:36	20
Chlorobenzene	1800	D	20		ug/L			12/11/17 20:36	20
1,2-Dichlorobenzene	20	U	20		ug/L			12/11/17 20:36	20
1,3-Dichlorobenzene	20	U	20		ug/L			12/11/17 20:36	20
1,4-Dichlorobenzene	20	U	20		ug/L			12/11/17 20:36	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		80 - 120			-		12/11/17 20:36	20
1,2-Dichloroethane-d4 (Surr)	91		73 <sub>-</sub> 131					12/11/17 20:36	20
Dibromofluoromethane (Surr)	96		80 - 122					12/11/17 20:36	20
4-Bromofluorobenzene (Surr)	97		80 - 120					12/11/17 20:36	20

5 6 7 9 10 11 12 13

Client: Solutia Inc.
Project/Site: 4Q17 LTM GW Sampling - 1403345

Client Sample ID: CPA-MW-5D-F(0.2)-1217         Lab Sample ID: 680-           Date Collected: 12/05/17 12:20         Ma           Date Received: 12/06/17 09:20         Ma								-146392-6 atrix: Water		
Method: 6010C - Metals (ICP Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron, Dissolved	16		0.050		mg/L		12/11/17 17:28	12/12/17 18:54	1	
Manganese, Dissolved	0.66		0.010		mg/L		12/11/17 17:28	12/12/17 18:54	1	
General Chemistry - Dissolv	ed									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Dissolved Organic Carbon	5.4		1.0		mg/L			12/13/17 14:41	1	

550 2/14/18 TestAmerica Savannah

TestAmerica Job ID: 680-146392-1 SDG: KPS206

### Client Sample ID: BSA-MW-5D-1217 Date Collected: 12/05/17 13:50 Date Received: 12/06/17 09:20 Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	, RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/11/17 21:00	1
Chlorobenzene	100		1.0		ug/L			12/11/17 21:00	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 21:00	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 21:00	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 21:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		80 - 120			-		12/11/17 21:00	1
1,2-Dichloroethane-d4 (Surr)	89		73 - 131					12/11/17 21:00	1
Dibromofluoromethane (Surr)	93		80 - 122					12/11/17 21:00	1
4-Bromofluorobenzene (Surr)	99		80 - 120					12/11/17 21:00	1

550 2114/18 TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 4Q17 LTM GW Sampling - 1403345

Client Sample ID: BSA-MW Date Collected: 12/05/17 13:50 Date Received: 12/06/17 09:20	-5D-F(0.2	:)-1217				Lab Sample ID: 680-146392 Matrix: Wa					
Method: 6010C - Metals (ICP) - Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac		
Iron, Dissolved	12		0.050		mg/L		12/11/17 17:28	12/12/17 18:38	1		
Manganese, Dissolved	0.26		0.010		mg/L		12/11/17 17:28	12/12/17 18:38	1		
General Chemistry - Dissolved Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac		
Dissolved Organic Carbon	9.5		1.0		mg/L			12/13/17 14:57	1		

53D 2/14/18 TestAmerica Savannah

TestAmerica Job ID: 680-146392-1 SDG: KPS206

#### Client Sample ID: 47Q17 Trip Blank #2 Date Collected: 12/05/17 00:00 Date Received: 12/06/17 09:20

### Lab Sample ID: 680-146392-9 Matrix: Water

#### Method: 8260B - Volatile Organic Compounds (GC/MS) Result Qualifier Dil Fac Analyte RL MDL Unit D Prepared Analyzed 1.0 U Benzene 1.0 12/11/17 16:29 ug/L 1.0 U Chlorobenzene 1.0 ug/L 12/11/17 16:29 1,2-Dichlorobenzene 1.0 U 1.0 12/11/17 16:29 ug/L 1,3-Dichlorobenzene 1.0 U 12/11/17 16:29 1.0 ug/L 1,4-Dichlorobenzene 1.0 U 1.0 ug/L 12/11/17 16:29 Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac Toluene-d8 (Surr) 97 80 - 120 12/11/17 16:29 1,2-Dichloroethane-d4 (Surr) 73-131 83 12/11/17 16:29 Dibromofluoromethane (Surr) 93 80 - 122 12/11/17 16:29 4-Bromofluorobenzene (Surr) 101 80 - 120 12/11/17 16:29

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TestAmerica Job ID: 680-146392-1 SDG: KPS206

#### Client Sample ID: CPA-MW-4D-1217 Date Collected: 12/05/17 15:25 Date Received: 12/06/17 09:20

#### Lab Sample ID: 680-146392-10 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/11/17 16:54	1
Chlorobenzene	140		1.0		ug/L			12/11/17 16:54	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 16:54	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 16:54	1
1,4-Dichlorobenzene	2.2		1.0		ug/L			12/11/17 16:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		80 - 120			-		12/11/17 16:54	1
1,2-Dichloroethane-d4 (Surr)	85		73 - 131					12/11/17 16:54	1
Dibromofluoromethane (Surr)	93		80 - 122					12/11/17 16:54	1
4-Bromofluorobenzene (Surr)	100		80 - 120					12/11/17 16:54	1

55D 2/14/18 TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 4Q17 LTM GW Sampling - 1403345

Client Sample ID: CPA-MW-4D-F(0.2)-1217 Date Collected: 12/05/17 15:25 Date Received: 12/06/17 09:20						Lab	o Sample II	D: 680-1463 Matrix:	
Method: 6010C - Metals (ICP) Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analvzed	Dil Fac
Iron, Dissolved	15		0.050		mg/L		12/11/17 17:28	12/12/17 18:13	1
Manganese, Dissolved	0.41		0.010		mg/L		12/11/17 17:28	12/12/17 18:13	1
General Chemistry - Dissolve Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	7.5		1.0		mg/L			12/13/17 15:14	1

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

Client Sample ID: GWE Date Collected: 12/05/17 09 Date Received: 12/15/17 17:	:27					La	ıb Sample	ID: 680-146 Matrix	972-1 Water
Method: RSK-175 - Dissol									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	Ū	1.1		ug/L			12/19/17 10:58	1
Ethylene	1.0	U	1.0		ug/L			12/19/17 10:58	1
Methane	79		0.58		ug/L			12/19/17 10:58	1
Method: 6010C - Metals (IC	CP) - Total Reco	overable							
Analyte	'	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	28		0.050		mg/L		12/28/17 10:43	12/29/17 02:57	1
Manganese	0.86		0.010		mg/L		12/28/17 10:43	12/29/17 02:57	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1500	P	50		mg/L			12/21/17 11:06	50
Nitrate as N	0.050	UNJ	0.050		mg/L			12/19/17 13:20	1
Sulfate	380	V	100		mg/L			12/21/17 10:35	20
Total Organic Carbon	6.7	1.000	1.0		mg/L			12/20/17 18:10	1
Alkalinity as CaCO3	450	JY J	5.0		mg/L			12/26/17 19:08	1
Carbon Dioxide, Free		HFJ	5.0		mg/L			12/26/17 11:04	1

3 4 5 7 8 9 10 11 12 13 14

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345 TestAmerica Job ID: 680-146392-1 SDG: KPS206

Client Sample ID: GWE Date Collected: 12/05/17 11 Date Received: 12/15/17 17				Lab Sample ID: 680-146972-2 Matrix: Water					
Method: RSK-175 - Dissol		) Qualifier			11-14	-	Durana	Analysis	DUE
Analyte Ethane	Result			MDL		D	Prepared	Analyzed 12/19/17 11:11	Dil Fac
Ethylene	1.0	÷	1.1		ug/L			12/19/17 11:11	1
Methane	12	0	0.58		ug/L ug/L			12/19/17 11:11	1
Method: 6010C - Metals (IC	CP) - Total Reco	overable							
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	18		0.050		mg/L		12/28/17 10:43	12/29/17 03:01	1
Manganese	0.42		0.010		mg/L		12/28/17 10:43	12/29/17 03:01	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	640	P	20		mg/L			12/21/17 11:06	20
Nitrate as N	0.050	ÚM 3	0.050		mg/L			12/19/17 13:21	1
Sulfate	730	$\mathcal{P}$	250		mg/L			12/21/17 10:35	50
Total Organic Carbon	3.7		1.0		mg/L			12/20/17 19:23	1
Alkalinity as CaCO3	370	X J	5.0		mg/L			12/26/17 19:08	1
Carbon Dioxide, Free		HEJ	5.0		mg/L			12/26/17 11:10	1

3 4 5 7 8 9 10 11 12 13 14



TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146392-1 SDG: KPS206

Client Sample ID: CPA Date Collected: 12/05/17 12 Date Received: 12/15/17 17				Lab Sample ID: 680-1469 Matrix: V					
Method: RSK-175 - Dissol Analyte	• •	) Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			12/19/17 11:24	1
Ethylene	1.0	U	1.0		ug/L			12/19/17 11:24	1
Methane	87		0.58		ug/L			12/19/17 11:24	1
Method: 6010C - Metals (IC Analyte		overable Qualifier	RL	MDI	Unit	D	Prepared	Analyzed	Dil Fac
Iron			0.050		mg/L		12/28/17 10:43	12/29/17 02:44	1
Manganese	0.66		0.010		mg/L		12/28/17 10:43	12/29/17 02:44	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	200	Y States and Stat	5.0		mg/L			12/21/17 11:06	5
Nitrate as N	0.050	UXJ	0.050		mg/L			12/19/17 13:23	1
Sulfate	40	$\mathcal{P}$	25		mg/L			12/21/17 10:24	5
Total Organic Carbon	5.2		1.0		mg/L			12/20/17 20:08	1
Alkalinity as CaCO3	600	H J	5.0		mg/L			12/26/17 19:08	1
Carbon Dioxide, Free	110	HF J	5.0		mg/L			12/26/17 11:14	1

4 5 7 8 9 10 11 12 13 14

5502/14/18

TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 4Q17 LTM GW Sampling - 1403345

lient Sample ID: CPA-MW-5D-1217 ate Collected: 12/05/17 13:50 ate Received: 12/15/17 17:10					Lab Sample ID: 680-146972 Matrix: Wa					
Method: RSK-175 - Dissolv Analyte	• • •	Qualifier	RL	MDI	Unit	D	Prepared	Analyzed	Dil Fac	
Ethane	9.2		1.1		ug/L		Ticpared	12/19/17 11:36	1	
Ethylene	1.0	U	1.0		ug/L			12/19/17 11:36	1	
Methane (TCD)	5900		390		ug/L			12/19/17 11:36	1	
Method: 6010C - Metals (IC	P) - Total Reco	overable								
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron	12		0.050		mg/L		12/28/17 10:43	12/29/17 02:49	1	
Manganese	0.26		0.010		mg/L		12/28/17 10:43	12/29/17 02:49	1	
General Chemistry										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Chloride	170	P	5.0		mg/L			12/21/17 11:06	5	
Nitrate as N	0.050	UK 3	0.050		mg/L			12/19/17 13:26	1	
Sulfate	5.0	U	5.0		mg/L			12/21/17 10:00	1	
Total Organic Carbon	7.8		1.0		mg/L			12/20/17 20:24	1	
Alkalinity as CaCO3	580	JY J	5.0		mg/L			12/26/17 19:08	1	
Carbon Dioxide, Free		HF 5	5.0		mg/L			12/26/17 11:17	1	

3 4 5 6 7 8 9 10 11 12 13 14 15

550 2/14/18 TestAmerica Savannah

Client: Solutia Inc.
Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146392-1 SDG: KPS206

53D 2/14/18

TestAmerica Savannah

Client Sample ID: CPA Date Collected: 12/05/17 15 Date Received: 12/15/17 17				Lab Sample ID: 680-1469 Matrix:					
Method: RSK-175 - Disso	• • •					_			
Analyte		Qualifier	RL	MDL	Unit	<u>D</u>	Prepared	Analyzed	Dil Fac
Ethane	7.8		1.1		ug/L			12/19/17 11:49	1
Ethylene		U	1.0		ug/L			12/19/17 11:49	1
Methane (TCD)	11000		390		ug/L			12/19/17 11:49	1
Method: 6010C - Metals (I	CP) - Total Reco	overable							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	15		0.050		mg/L		12/28/17 10:43	12/29/17 02:53	1
Manganese	0.41		0.010		mg/L		12/28/17 10:43	12/29/17 02:53	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	210	P	5.0		mg/L			12/21/17 11:06	5
Nitrate as N	0.050	UN 🏷	0.050		mg/L			12/19/17 13:27	1
Sulfate	5.0	U	5.0		mg/L			12/21/17 10:21	1
Total Organic Carbon	7.4		1.0		mg/L			12/20/17 20:41	1
Alkalinity as CaCO3	610	K J	5.0		mg/L			12/26/17 19:08	1
Carbon Dioxide, Free	78	Contraction and Contraction of Contr	5.0		mg/L			12/26/17 11:18	1

2 3 4 5 6 7 8 9 10 11 12 13 14 15

### **Surrogate Summary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

Prep Type: Total/NA

### Method: 8260B - Volatile Organic Compounds (GC/MS)

B.4	A	Mater
Ivia	trix:	Water

		Percent Surrogate Recovery (Acceptance Limi									
		TOL	DCA	DBFM	BFB						
Lab Sample ID	Client Sample ID	(80-120)	(73-131)	(80-122)	(80-120)						
680-146392-1	GWE-3D-1217	98	90	97	97						
680-146392-3	GWE-2D-1217	100	81	93	99						
680-146392-5	CPA-MW-5D-1217	97	91	96	97						
680-146392-7	BSA-MW-5D-1217	98	89	93	99						
680-146392-7 MS	BSA-MW-5D-1217	96	86	94	95						
680-146392-7 MSD	BSA-MW-5D-1217	100	91	97	99						
680-146392-9	47Q17 Trip Blank #2	97	83	93	101						
680-146392-10	CPA-MW-4D-1217	99	85	93	100						
LCS 680-505854/4	Lab Control Sample	93	92	97	96						
LCSD 680-505854/5	Lab Control Sample Dup	97	92	98	100						
MB 680-505854/9	Method Blank	99	84	91	96						

Surrogate Legend

TOL = Toluene-d8 (Surr)

DCA = 1,2-Dichloroethane-d4 (Surr)

DBFM = Dibromofluoromethane (Surr)

BFB = 4-Bromofluorobenzene (Surr)

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### Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-505854/9 Matrix: Water Analysis Batch: 505854						(		ple ID: Method Prep Type: To	
	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/11/17 13:37	1
Chlorobenzene	1.0	U	1.0		ug/L			12/11/17 13:37	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 13:37	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 13:37	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/11/17 13:37	1
	MR	MR							

	мв	мв		
Surrogate	%Recovery	Qualifier	Limits	Prepared
Toluene-d8 (Surr)	99		80 - 120	
1,2-Dichloroethane-d4 (Surr)	84		73 - 131	
Dibromofluoromethane (Surr)	91		80 - 122	
4-Bromofluorobenzene (Surr)	96		80 - 120	

#### Lab Sample ID: LCS 680-505854/4 Matrix: Water Analysis Batch: 505854

	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Benzene	50.0	49.1		ug/L		98	80 - 120
Chlorobenzene	50.0	49.3		ug/L		99	80 - 120
1,2-Dichlorobenzene	50.0	48.9		ug/L		98	80 - 120
1,3-Dichlorobenzene	50.0	48.8		ug/L		98	80 - 120
1,4-Dichlorobenzene	50.0	49.0		ug/L		98	80 - 120

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	93		80 - 120
1,2-Dichloroethane-d4 (Surr)	92		73 - 131
Dibromofluoromethane (Surr)	97		80 - 122
4-Bromofluorobenzene (Surr)	96		80 - 120

#### Lab Sample ID: LCSD 680-505854/5 Matrix: Water Analysis Batch: 505854

-	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	50.0	50.5		ug/L		101	80 - 120	3	20
Chlorobenzene	50.0	49.8		ug/L		100	80 - 120	1	20
1,2-Dichlorobenzene	50.0	50.2		ug/L		100	80 - 120	3	20
1,3-Dichlorobenzene	50.0	49.3		ug/L		99	80 - 120	1	20
1,4-Dichlorobenzene	50.0	50.1		ug/L		100	80 - 120	2	20

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	97		80 - 120
1,2-Dichloroethane-d4 (Surr)	92		73 - 131
Dibromofluoromethane (Surr)	98		80 - 122
4-Bromofluorobenzene (Surr)	100		80 - 120

## Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyzed 12/11/17 13:37

12/11/17 13:37

12/11/17 13:37

12/11/17 13:37

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#### Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

SSD 2/14/18 TestAmerica Savannah

Client Sample ID: BSA-MW-5D-1217

Prep Type: Total/NA

### Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-1463 Matrix: Water Analysis Batch: 505854	92-7 MS						Client \$	Sample	ID: BSA-MW-5D-1217 Prep Type: Total/NA
	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Benzene	1.0	U	50.0	47.8		ug/L		96	80 - 120
Chlorobenzene	100		50.0	145		ug/L		87	80 - 120
1,2-Dichlorobenzene	1.0	U	50.0	46.9		ug/L		94	80 <sub>-</sub> 120
1,3-Dichlorobenzene	1.0	U	50.0	46.9		ug/L		94	80 - 120
1,4-Dichlorobenzene	1.0	U	50.0	46.5		ug/L		92	80 - 120
	MS	MS							
Surrogate	%Recovery	Qualifier	l imite						

Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	96		80 - 120
1,2-Dichloroethane-d4 (Surr)	86		73 - 131
Dibromofluoromethane (Surr)	94		80 - 122
4-Bromofluorobenzene (Surr)	95		80 - 120

#### Lab Sample ID: 680-146392-7 MSD Matrix: Water Analysis Batch: 505854

5	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	1.0	U	50.0	49.5		ug/L		99	80 - 120	3	20
Chlorobenzene	100		50.0	150		ug/L		98	80 - 120	4	20
1,2-Dichlorobenzene	1.0	U	50.0	49.4		ug/L		99	80 - 120	5	20
1,3-Dichlorobenzene	1.0	U	50.0	49.2		ug/L		98	80 - 120	5	20
1,4-Dichlorobenzene	1.0	U	50.0	50.3		ug/L		99	80 - 120	8	20
	MSD	MSD									
Surrogate	%Recovery	Qualifier	Limits								
Toluene-d8 (Surr)	100		80 - 120								
1,2-Dichloroethane-d4 (Surr)	91		73 - 131								
Dibromofluoromethane (Surr)	97		80 - 122								
4-Bromofluorobenzene (Surr)	99		80 - 120								

#### Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 680-506930/10 Matrix: Water Analysis Batch: 506930								Clie	ent Sa	mple ID: Method Prep Type: To	
	MB	MB									
Analyte	Result	Qualifier		RL	M	DL Unit	0	) Р	repared	l Analyzed	Dil Fac
Ethane	1.1	U		1.1		ug/L				12/19/17 10:36	1
Ethylene	1.0	U		1.0		ug/L				12/19/17 10:36	1
Methane	0.58	U		0.58		ug/L				12/19/17 10:36	1
Methane (TCD)	390	U		390		ug/L				12/19/17 10:36	1
_ Lab Sample ID: LCS 680-506930/3 Matrix: Water							Clier	nt Sai	mple I	D: Lab Control S Prep Type: To	•
Analysis Batch: 506930										1100 1300. 13	
<b>,</b>			Spike		LCS I	.cs				%Rec.	
Analyte			Added	Re	esult (	Qualifier	Unit	D	%Rec	Limits	
Methane (TCD)			1920	·	1700		ug/L		88	75 - 125	
										S SD 2/14/2 TestAmerica Sa	

#### Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: LCS 680-506930/7 Matrix: Water				Clie	nt Sar	nple ID	: Lab Con		
Analysis Batch: 506930							Ргер Тур	be: Tot	a!/ IN/
	Spike	LCS	LCS				%Rec.		
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Ethane	288	274		ug/L		95	75 - 125		
Ethylene	269	256		ug/L		95	75 - 125		
Lab Sample ID: LCSD 680-506930/4			C	lient Sa	ample	ID: Lab	o Control	Sample	e Du
Matrix: Water							Prep Typ	be: Tot	al/N
Analysis Batch: 506930									
	Spike	LCSD	LCSD				%Rec.		RP
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Lin
Methane (TCD)	1920	1730		ug/L		90	75 - 125	2	:
_ab Sample ID: LCSD 680-506930/8			c	lient Sa	ample	ID: Lat	o Control	Sample	e Du
Matrix: Water					•		Prep Typ		
	Spike	LCSD	LCSD				%Rec.		RF
Analysis Batch: 506930	Spike Added		LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
Analysis Batch: 506930 Analyte Ethane	•			Unit ug/L	<u>D</u>	%Rec 99		RPD 5	RP Lin

#### Method: 6010C - Metals (ICP)

Manganese, Dissolved

Lab Sample ID: MB 680-50593 Matrix: Water Analysis Batch: 506233	5/1-А мв	МВ					C		ele ID: Methoo : Total Recov Prep Batch:	verable
Analyte	Result	Qualifier	RI	. 1	MDL Unit	t	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	0.050	U	0.05	<u> </u>	mg/		12	2/11/17 13:55	12/12/17 19:41	1
Manganese, Dissolved	0.010	U	0.010	)	mg/	L	12	2/11/17 13:55	12/12/17 19:41	1
Lab Sample ID: LCS 680-5059 Matrix: Water Analysis Batch: 506233	35/2-A		Spike	LCS	LCS	Cli	ent S		Lab Control S : Total Recov Prep Batch: %Rec.	verable
Analyte			Added		Qualifier	Unit	1	D %Rec	Limits	
Iron, Dissolved			10.0	10.1		mg/L		101	80 - 120	
Manganese, Dissolved			1.00	1.06		mg/L		106	80 - 120	
[										
Lab Sample ID: MB 680-50598 Matrix: Water Analysis Batch: 506233							C		ole ID: Method e: Total Reco Prep Batch:	verable
Matrix: Water Analysis Batch: 506233	МВ	МВ						Prep Type	e: Total Reco Prep Batch:	verable 505982
Matrix: Water	МВ	Qualifier	RI		MDL Uni mg/		D		e: Total Reco Prep Batch: 	verable

⇒⇒D 2/14/18 TestAmerica Savannah

1

12/11/17 17:28 12/12/17 17:36

0.010.

mg/L

0.010 U

Lab Sample ID: LCS 680-507401/5

Matrix: Water

#### Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 680-505982/2- Matrix: Water	A						Clie	ent S			Lab Control : : Total Reco	
Analysis Batch: 506233									Fleb		Prep Batch:	
Allalysis Batch. 506255			Spike	1.05	LCS						Rec.	505962
Analyte			Added		Qualifi	ior	Unit		D %R		Limits	
Iron. Dissolved		······ ···	5.00	5.20			mg/L				80 - 120	
Manganese, Dissolved			0.500	0.543			mg/L				80 - 120 80 - 120	
Lab Sample ID: MB 680-507971/1-/	4							С	lient S	Samp	le ID: Metho	d Blank
Matrix: Water								-		-	: Total Reco	
Analysis Batch: 508112									1-		Prep Batch:	
•	МВ	MB									-1	
Analyte	Result	Qualifier	R	L	MDL U	nit		D	Prepar	red	Analyzed	Dil Fac
Iron	0.050	U	0.05	0	m	ig/L		- <u>1</u>	2/28/17	10:43	12/29/17 02:06	
Manganese	0.010	U	0.01	0	m	ig/L		1	2/28/17	10:43	12/29/17 02:06	
						•						
	A					•	Clie	ent S	Sample	e ID: I	Lab Control	Sample
Lab Sample ID: LCS 680-507971/2	A					•	Clie	ent S			Lab Control : : Total Reco	
Lab Sample ID: LCS 680-507971/2 Matrix: Water	-A					•	Clie	ent S		Туре	: Total Reco	verable
Lab Sample ID: LCS 680-507971/2 Matrix: Water	-A		Spike	LCS	LCS	-	Clie	ent S		Туре		verable
Lab Sample ID: LCS 680-507971/2 Matrix: Water Analysis Batch: 508112	-A		Spike Added		LCS Qualifi	ier	Clie			Туре	: Total Reco Prep Batch:	verable
Lab Sample ID: LCS 680-507971/2 Matrix: Water Analysis Batch: 508112	<b>A</b>		•		Qualifi	ier			Prep D %R	Туре ес	e: Total Reco Prep Batch: %Rec.	verable
Lab Sample ID: LCS 680-507971/2 Matrix: Water Analysis Batch: 508112 <sup>Analyte</sup>	<b>.A</b>		Added	Result	Qualifi	ier	Unit		Prep	Type	e: Total Reco Prep Batch: %Rec. Limits	verable
Lab Sample ID: LCS 680-507971/2 Matrix: Water Analysis Batch: 508112 Analyte Iron Manganese			Added 5.00	Result 5.39	Qualifi	ier	Unit mg/L		Prep	Type	e: Total Reco Prep Batch: %Rec. Limits 80 - 120	verable
Lab Sample ID: LCS 680-507971/2 Matrix: Water Analysis Batch: 508112 Analyte Iron Manganese Nethod: 325.2-1978 - Chloride			Added 5.00	Result 5.39	Qualifi	ier	Unit mg/L		Prep D %R 1 1	<b>Type</b> <b>ec</b> 08 12	e: Total Reco Prep Batch: %Rec. Limits 80 - 120	verable 50797
Lab Sample ID: LCS 680-507971/2 Matrix: Water Analysis Batch: 508112 Analyte Iron Manganese Aethod: 325.2-1978 - Chloride Lab Sample ID: MB 680-507401/4			Added 5.00	Result 5.39	Qualifi	ier	Unit mg/L		Prep D %R 1 1	Type ec 08 12 Samp	e: Total Reco Prep Batch: %Rec. Limits 80 - 120 80 - 120	verable 50797′ d Blanl
Lab Sample ID: LCS 680-507971/2 Matrix: Water Analysis Batch: 508112 Analyte Iron Manganese Method: 325.2-1978 - Chloride Lab Sample ID: MB 680-507401/4 Matrix: Water			Added 5.00	Result 5.39	Qualifi	ier	Unit mg/L		Prep D %R 1 1	Type ec 08 12 Samp	e: Total Reco Prep Batch: %Rec. Limits 80 - 120 80 - 120 80 - 120	verable 50797′ d Blanl
Lab Sample ID: LCS 680-507971/2 Matrix: Water Analysis Batch: 508112 Iron Manganese Method: 325.2-1978 - Chloride Lab Sample ID: MB 680-507401/4 Matrix: Water	)	 	Added 5.00	Result 5.39	Qualifi	ier	Unit mg/L		Prep D %R 1 1	Type ec 08 12 Samp	e: Total Reco Prep Batch: %Rec. Limits 80 - 120 80 - 120 80 - 120	verable 50797 d Blan
Lab Sample ID: LCS 680-507971/2 Matrix: Water Analysis Batch: 508112 Analyte Iron	) ) 	MB Qualifier	Added 5.00	Result 5.39 0.562	Qualifi		Unit mg/L		Prep D %R 1 1	Type ec 08 12 Samp	e: Total Reco Prep Batch: %Rec. Limits 80 - 120 80 - 120 80 - 120	verable 50797′ d Blanl

# **Client Sample ID: Lab Control Sample**

Prep Type: Total/NA

Analysis Batch: 507401	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Chloride	25.0	26.5		mg/L		106	85 - 115
Lab Sample ID: LCSD 680-507401/7 Matrix: Water			C	lient Sa	mple	ID: Lab	Control Sample Dup Prep Type: Total/NA

#### Prep Type: Total/NA

Analysis Batch: 507401									
	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Chloride	25.0	26.7		mg/L		107	85 - 115	1	30

### **QC Sample Results**

Analyte

Dissolved Organic Carbon

#### Method: 353.2-1993 R2.0 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 680-507036/13									(	Clie	nt Sam	nple ID: M	ethod	Blank
Matrix: Water												Prep Ty	pe: To	tal/NA
Analysis Batch: 507036		MD												
Analyte		MB Qualifier		RL		MDL	linit		D	р.	repared	Analy	boz	Dil Fac
Nitrate as N	0.050			0.050			mg/L			<b>F</b> 1	epareu			1 Tac
	0.000	0	·	0.000			mg/c					12/10/11	10.12	
Lab Sample ID: LCS 680-507036/16 Matrix: Water	5							Cli	ent	Sar	nple ID	: Lab Coi Prep Ty		•
Analysis Batch: 507036			0		1.00							0/ D		
Analyte			Spike Added		Result	LCS	lifior	Unit		D	%Rec	%Rec. Limits		
Nitrate as N			0.500		0.508	Quai	IIIei	mg/L		_	102	75 - 125		
Nitrate Nitrite as N			1.00		1.01			mg/L			102	90 - 110		
Nitrite as N			0.500		0.502			mg/L			100	90 - 110 90 - 110		
			0.000		0.002							000110		
ethod: 375.4-1978 - Sulfate														
Lab Sample ID: MB 680-507400/4									(	Clie	ent San	nple ID: M		
Matrix: Water												Ргер Ту	pe: IC	otal/NA
Analysis Batch: 507400	MO	мв												
Analyte		MB Qualifier		RL		MDL	lleit		D	D	ronarod	Analy	Tod	Dil Eco
Analyte Sulfate	5.0			5.0			mg/L		<u> </u>	P	repared	Analy 12/21/17		Dil Fac
Sunate	5.0	0		5.0			ing/L					12/21/17	10.17	I
Lab Sample ID: LCS 680-507400/5								Cli	ient	Sar	nple ID	: Lab Co	ntrol S	Sample
Matrix: Water												Prep Ty		
Analysis Batch: 507400														
-			Spike		LCS	LCS						%Rec.		
Analyte			Added		Result	Qual	lifier	Unit		D	%Rec	Limits		
					40.4			mg/L			90			
Sulfate			20.0		18.1			ing/c			90	75 - 125		
Sulfate	7		20.0		18.1		~		Sam	nlo			Samn	
Lab Sample ID: LCSD 680-507400/	7		20.0		18.1		c		Sam	ple		o Control		
Lab Sample ID: LCSD 680-507400/ Matrix: Water	7		20.0		18.1		c		Sam	ple				
Lab Sample ID: LCSD 680-507400/ Matrix: Water	7					LCS			Sam	ple		o Control Prep Ty		otal/NA
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400	7		Spike		LCSD		D	iient S	Sam	ple	ID: Lal	o Control Prep Ty %Rec.	pe: To	otal/NA RPD
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400 Analyte	7						D	Unit	Sam	-		o Control Prep Ty		RPD Limit
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400	7		Spike Added		LCSD Result		D	iient S	Sam	-	ID: Lal	Control Prep Ty %Rec. Limits	pe: To RPD	RPD Limit
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400 Analyte	7		Spike Added		LCSD Result		D	Unit	Sam	-	ID: Lal	Control Prep Ty %Rec. Limits	pe: To RPD	RPD Limit
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400 Analyte <sup>Sulfate</sup> <b>/lethod: 415.1-1974 - DOC</b>	7		Spike Added		LCSD Result		D	Unit		D	ID: Lal <u>%Rec</u> 98	Control Prep Ty %Rec. Limits 75 - 125	RPD 8	RPD Limit
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400 Analyte Sulfate Iethod: 415.1-1974 - DOC Lab Sample ID: MB 680-506528/2	7		Spike Added		LCSD Result		D	Unit		D	ID: Lal	o Control Prep Ty %Rec. Limits 75-125	RPD RPD 8	RPD Limit Blank
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400 Analyte Sulfate Iethod: 415.1-1974 - DOC Lab Sample ID: MB 680-506528/2 Matrix: Water	7		Spike Added		LCSD Result		D	Unit		D	ID: Lal	Control Prep Ty %Rec. Limits 75 - 125	RPD RPD 8	RPD Limit Blank
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400 Analyte Sulfate Iethod: 415.1-1974 - DOC Lab Sample ID: MB 680-506528/2 Matrix: Water		MB	Spike Added		LCSD Result		D	Unit		D	ID: Lal	o Control Prep Ty %Rec. Limits 75-125	RPD RPD 8	RPD Limit Blank
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400 Analyte Sulfate /lethod: 415.1-1974 - DOC Lab Sample ID: MB 680-506528/2 Matrix: Water Analysis Batch: 506528		MB Qualifier	Spike Added	RL	LCSD Result 19.5		D lifier	Unit		D	ID: Lal	o Control Prep Ty %Rec. Limits 75-125	RPD RPD 8 lethod e: Dis	RPD Limit Blank
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400 Analyte Sulfate Method: 415.1-1974 - DOC Lab Sample ID: MB 680-506528/2 Matrix: Water Analysis Batch: 506528		Qualifier	Spike Added	<b>RL</b> 1.0	LCSD Result 19.5	Qual	D lifier	Unit		D	ID: Lal	o Control Prep Ty %Rec. Limits 75 - 125	RPD RPD Elethod e: Dis zed	RPD Limit Bank Blank
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400 Analyte Sulfate Method: 415.1-1974 - DOC Lab Sample ID: MB 680-506528/2 Matrix: Water Analysis Batch: 506528 Analyte Dissolved Organic Carbon	MB Result	Qualifier	Spike Added		LCSD Result 19.5	Qual	D lifier	Unit mg/L	<u>D</u>	D Clie P	ID: Lal	o Control Prep Ty %Rec. Limits 75 - 125 nple ID: N Prep Typ Analy 12/13/17	RPD RPD 8 lethod e: Dis zed 11:45	Limi Blank Solvec
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400 Analyte Sulfate lethod: 415.1-1974 - DOC Lab Sample ID: MB 680-506528/2 Matrix: Water Analysis Batch: 506528 Analyte Dissolved Organic Carbon Lab Sample ID: LCS 680-506528/4	MB Result	Qualifier	Spike Added		LCSD Result 19.5	Qual	D lifier	Unit mg/L	<u>D</u>	D Clie P	ID: Lal	o Control Prep Ty %Rec. Limits 75-125 nple ID: N Prep Typ <u>Analy</u> 12/13/17 D: Lab Co	RPD RPD e: Dis zed 11:45 ntrol \$	Limita Blank Solved
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400 Analyte Sulfate lethod: 415.1-1974 - DOC Lab Sample ID: MB 680-506528/2 Matrix: Water Analysis Batch: 506528 Analyte Dissolved Organic Carbon Lab Sample ID: LCS 680-506528/4 Matrix: Water	MB Result	Qualifier	Spike Added		LCSD Result 19.5	Qual	D lifier	Unit mg/L	<u>D</u>	D Clie P	ID: Lal	o Control Prep Ty %Rec. Limits 75 - 125 nple ID: N Prep Typ Analy 12/13/17	RPD RPD e: Dis zed 11:45 ntrol \$	Limita Blank Solved
Lab Sample ID: LCSD 680-507400/ Matrix: Water Analysis Batch: 507400 Analyte <sup>Sulfate</sup>	MB Result	Qualifier	Spike Added		LCSD Result 19.5	Qual	D lifier Unit mg/L	Unit mg/L	<u>D</u>	D Clie P	ID: Lal	o Control Prep Ty %Rec. Limits 75-125 nple ID: N Prep Typ <u>Analy</u> 12/13/17 D: Lab Co	RPD RPD e: Dis zed 11:45 ntrol \$	Limita Blank Solved

TestAmerica Savannah SJD 2/14/18

Limits

80 - 120

D %Rec

104

Result Qualifier Unit

mg/L

20.7

Added

20.0

### **QC Sample Results**

Client: Solutia Inc.

TestAmerica Job ID: 680-146392-1 SDG: KPS206

Project/Site: 4Q17 LTM GW S	Sampling - 1	403345						100	America			PS206
Lab Sample ID: LCSD 680- Matrix: Water	506528/5					C	lient S	Sample		o Control S Prep Type		
Analysis Batch: 506528											. 2100	onou
·····			Spike	LC	CSD	LCSD				%Rec.		RPD
Analyte			Added	Re	sult	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Dissolved Organic Carbon			20.0		20.2		mg/L		101	80 - 120	3	20
Method: 415.1-1974 - T	00											
Lab Sample ID: MB 680-50	7316/2							Cli	ient Sam	nple ID: Me		
Matrix: Water Analysis Batch: 507316										Prep Тур	e: 10	tal/NA
		MB MB										
Analyte	Re	sult Qualifier		RL	I	MDL Unit		DI	Prepared	Analyze	əd	Dil Fac
Total Organic Carbon		1.0 U		1.0		mg/L				12/20/17 1	8:41	1
Lab Sample ID: LCS 680-5 Matrix: Water	07316/3						Cli	ent Sa	ample ID	: Lab Conf Prep Typ		
Analysis Batch: 507316												
			Spike	I	LCS	LCS				%Rec.		
Analyte			Added	Re	esult	Qualifier	Unit	D	%Rec	Limits		
Total Organic Carbon			20.0		18.8		mg/L		94	80 - 120		
Lab Sample ID: LCSD 680- Matrix: Water	507316/4					C	lient S	Sample	e ID: Lat	o Control S Prep Typ		
Analysis Batch: 507316												
			Spike			LCSD				%Rec.		RPD
Analyte			Added			Qualifier	Unit	D		Limits	RPD	Limit
Total Organic Carbon			20.0		18.8		mg/L		94	80 - 120	0	25
Lab Sample ID: 680-14697 Matrix: Water	2-2 MS							Cli	ient San	nple ID: GV Prep Typ		
Analysis Batch: 507316	0	0	0									
America	•	Sample	Spike			MS		_		%Rec.		
Analyte		Qualifier	Added			Qualifier	Unit	D		Limits		
Total Organic Carbon	3.7		20.0		22.9		mg/L		96	80 - 120		
Lab Sample ID: 680-14697	2-2 MSD							Cli	ient San	nple ID: GV		
Matrix: Water										Prep Тур	e: To	tal/NA
Analysis Batch: 507316	0 annu 1 a	0 annual a	0									
Anglyta	•	Sample	Spike			MSD	11		0/ D	%Rec.		RPD
Analyte Total Organic Carbon	3.7	Qualifier	Added 20.0		23.3	Qualifier	Unit mg/L	D	98 %	Limits 80 - 120	RPD 2	Limit 25
Lab Sample ID: MB 680-50	7320/2						-	Cli	ient San	ıple ID: Me Prep Typ		
Matrix: Water											0.10	
Matrix: Water Analysis Batch: 507320											0.10	
Analysis Batch: 507320	R	MB MB		RI		WDI Unit		п	Prenared			Dil Eac
	Re	MB MB esult Qualifier		<b>RL</b>		MDL Unit		D	Prepared	Analyza 12/20/17 1	ed	Dil Fac
Analysis Batch: 507320 Analyte Total Organic Carbon Lab Sample ID: LCS 680-5 Matrix: Water		sult Qualifier			1		Cli		•	Analyz	ed  2:42   <b>trol S</b>	1 ample
Analysis Batch: 507320 Analyte Total Organic Carbon Lab Sample ID: LCS 680-5		sult Qualifier		1.0		mg/L	Cli		•	Analyza 12/20/17 1 D: Lab Cont Prep Typ	ed  2:42   <b>trol S</b>	1 ample
Analysis Batch: 507320 Analyte Total Organic Carbon Lab Sample ID: LCS 680-5 Matrix: Water		sult Qualifier	Spike	1.0	LCS		Cli		ample ID	Analyza 12/20/17 1 D: Lab Cont	ed  2:42   <b>trol S</b>	1 ample

### **QC Sample Results**

Lab Sample ID: LCSD 680-507320 Matrix: Water Analysis Batch: 507320	/4					C	lient S	ampl	e ID: La	b Control Prep Ty	•	
Analysis Baten. 607 626			Spike		LCSD	LCSD				%Rec.		RPI
Analyte			Added		Result	Qualifier	Unit	0	%Rec	Limits	RPD	Lim
Total Organic Carbon			20.0		18.8		mg/L		94	80 - 120	0	2
/lethod: SM 2320B - Alkalinit	у		ς							2		
Lab Sample ID: MB 310-190007/1								CI	ient Sar	nple ID: M		
Matrix: Water										Prep Ty	pe: Io	tal/N/
Analysis Batch: 190007		МВ										
Analyte		Qualifier		RL		MDL Unit		D	Dremered	Anche		Dil Fa
Alkalinity as CaCO3	5.0	-		5.0				<u> </u>	Prepared	Analyz		рії га
	5.0	0		5.0		iiig/L				12/20/17	19.00	
Lab Sample ID: LCS 310-190007/2							Cli	ent S	ample II	D: Lab Cor	ntrol S	amnl
Lab Sample ID: LCS 310-190007/2 Matrix: Water	•						Cli	ent Sa	ample II	D: Lab Cor Prep Ty		-
Matrix: Water							Cli	ent Sa	ample II	D: Lab Cor Prep Ty		-
Matrix: Water			Spike		LCS	LCS	Cli	ent Sa	ample II			-
Matrix: Water Analysis Batch: 190007			Spike Added			LCS Qualifier	Cli Unit		ample II %Rec	Prep Tyj		-
Lab Sample ID: LCS 310-190007/2 Matrix: Water Analysis Batch: 190007 Analyte Alkalinity as CaCO3				1					• >	Prep Tyj %Rec.		-
Matrix: Water Analysis Batch: 190007 Analyte		bon Dic	Added 1060		Result		Unit		) %Rec	Prep Tyj %Rec. Limits		
Matrix: Water Analysis Batch: 190007 Analyte Alkalinity as CaCO3		bon Dic	Added 1060		Result		Unit	<u>C</u>	96 %Rec	Prep Tyj %Rec. Limits	pe: To	tal/N
Matrix: Water Analysis Batch: 190007 Analyte Alkalinity as CaCO3 Method: SM 4500 CO2 C - Fre		bon Dic	Added 1060		Result		Unit	<u>C</u>	96 %Rec	Prep Tyj %Rec. Limits 90 - 110	we-3E	tal/N/
Matrix: Water Analysis Batch: 190007 Analyte Alkalinity as CaCO3 Iethod: SM 4500 CO2 C - Fre Lab Sample ID: 680-146972-1 DU		bon Dic	Added 1060		Result		Unit	<u>C</u>	96 %Rec	Prep Tyj %Rec. 	we-3E	tal/N

Result Qualifier Unit

mg/L

85.0

D

**Result Qualifier** 

89 HF

Analyte

Carbon Dioxide, Free

530 2/14/18 TestAmerica Savannah

RPD

4

Limit

23

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345 TestAmerica Job ID: 680-146392-1 SDG: KPS206

### GC/MS VOA

#### Analysis Batch: 505854

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-146392-1	GWE-3D-1217	Total/NA	Water	8260B	
680-146392-3	GWE-2D-1217	Total/NA	Water	8260B	
680-146392-5	CPA-MW-5D-1217	Total/NA	Water	8260B	
680-146392-7	BSA-MW-5D-1217	Total/NA	Water	8260B	
680-146392-9	47Q17 Trip Blank #2	Total/NA	Water	8260B	
680-146392-10	CPA-MW-4D-1217	Total/NA	Water	8260B	
MB 680-505854/9	Method Blank	Total/NA	Water	8260B	
LCS 680-505854/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-505854/5	Lab Control Sample Dup	Total/NA	Water	8260B	
680-146392-7 MS	BSA-MW-5D-1217	Total/NA	Water	8260B	
680-146392-7 MSD	BSA-MW-5D-1217	Total/NA	Water	8260B	

#### GC VOA

#### Analysis Batch: 506930

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146392-1	GWE-3D-1217	Total/NA	Water	8260B	
680-146392-3	GWE-2D-1217	Total/NA	Water	8260B	
680-146392-5	CPA-MW-5D-1217	Total/NA	Water	8260B	
680-146392-7	BSA-MW-5D-1217	Total/NA	Water	8260B	
680-146392-9	47Q17 Trip Blank #2	Total/NA	Water	8260B	
680-146392-10	CPA-MW-4D-1217	Total/NA	Water	8260B	
MB 680-505854/9	Method Blank	Total/NA	Water	8260B	
LCS 680-505854/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-505854/5	Lab Control Sample Dup	Total/NA	Water	8260B	
680-146392-7 MS	BSA-MW-5D-1217	Total/NA	Water	8260B	
680-146392-7 MSD	BSA-MW-5D-1217	Total/NA	Water	8260B	
	930				
nalysis Batch: 506 Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
nalysis Batch: 506 Lab Sample ID		Prep Type Total/NA	Matrix Water	Method RSK-175	Prep Batch
nalysis Batch: 506 Lab Sample ID 680-146972-1	Client Sample ID				Prep Batch
nalysis Batch: 506 Lab Sample ID 680-146972-1 680-146972-2	Client Sample ID GWE-3D-1217	Total/NA	Water	RSK-175	Prep Batch
Lab Sample ID           680-146972-1           680-146972-2           680-146972-3	Client Sample ID GWE-3D-1217 GWE-2D-1217	Total/NA Total/NA	Water Water	RSK-175 RSK-175	Prep Batch
<b>Lab Sample ID</b> 680-146972-1 680-146972-2 680-146972-3 680-146972-3 680-146972-4	Client Sample ID GWE-3D-1217 GWE-2D-1217 CPA-MW-5D-1217	Total/NA Total/NA Total/NA	Water Water Water	RSK-175 RSK-175 RSK-175	Prep Batch
Inalysis Batch: 506           Lab Sample ID           680-146972-1           680-146972-2           680-146972-3           680-146972-4           680-146972-5           MB 680-506930/10	Client Sample ID GWE-3D-1217 GWE-2D-1217 CPA-MW-5D-1217 CPA-MW-5D-1217 CPA-MW-4D-1217 Method Blank	Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA	Water Water Water Water	RSK-175 RSK-175 RSK-175 RSK-175	Prep Batch
Lab Sample ID           680-146972-1           680-146972-2           680-146972-3           680-146972-4           680-146972-5           MB 680-506930/10           LCS 680-506930/3	Client Sample ID GWE-3D-1217 GWE-2D-1217 CPA-MW-5D-1217 CPA-MW-5D-1217 CPA-MW-4D-1217	Total/NA Total/NA Total/NA Total/NA Total/NA	Water Water Water Water Water	RSK-175 RSK-175 RSK-175 RSK-175 RSK-175	Prep Batch
Lab Sample ID           680-146972-1           680-146972-2           680-146972-3           680-146972-4           680-146972-5           MB 680-506930/10           LCS 680-506930/7	Client Sample ID GWE-3D-1217 GWE-2D-1217 CPA-MW-5D-1217 CPA-MW-5D-1217 CPA-MW-4D-1217 Method Blank Lab Control Sample Lab Control Sample	Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA	Water Water Water Water Water Water	RSK-175 RSK-175 RSK-175 RSK-175 RSK-175 RSK-175	Prep Batch
C VOA Analysis Batch: 506 Lab Sample ID 680-146972-1 680-146972-2 680-146972-3 680-146972-4 680-146972-5 MB 680-506930/10 LCS 680-506930/7 LCSD 680-506930/7 LCSD 680-506930/8	Client Sample ID GWE-3D-1217 GWE-2D-1217 CPA-MW-5D-1217 CPA-MW-5D-1217 CPA-MW-4D-1217 Method Blank Lab Control Sample	Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA Total/NA	Water Water Water Water Water Water Water	RSK-175 RSK-175 RSK-175 RSK-175 RSK-175 RSK-175 RSK-175	Prep Batch

#### Metals

#### Prep Batch: 505935

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
MB 680-505935/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-505935/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
rep Batch: 505982					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146392-2	GWE-3D-F(0.2)-1217	Dissolved	Water	3005A	
680-146392-4	GWE-2D-F(0.2)-1217	Dissolved	Water	3005A	
680-146392-6	CPA-MW-5D-F(0.2)-1217	Dissolved	Water	3005A	
680-146392-8	BSA-MW-5D-F(0.2)-1217	Dissolved	Water	3005A	
680-146392-11	CPA-MW-4D-F(0.2)-1217	Dissolved	Water	3005A	
MB 680-505982/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-505982/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
nalysis Batch: 506	233				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146392-2	GWE-3D-F(0.2)-1217	Dissolved	Water	6010C	505982
680-146392-4	GWE-2D-F(0.2)-1217	Dissolved	Water	6010C	505982
680-146392-6	CPA-MW-5D-F(0.2)-1217	Dissolved	Water	6010C	505982
680-146392-8	BSA-MW-5D-F(0.2)-1217	Dissolved	Water	6010C	505982
				SJD 2	114/18

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146392-1 SDG: KPS206

#### Metals (Continued)

#### Analysis Batch: 506233 (Continued)

	( )				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146392-11	CPA-MW-4D-F(0.2)-1217	Dissolved	Water	6010C	505982
MB 680-505935/1-A	Method Blank	Total Recoverable	Water	6010C	505935
MB 680-505982/1-A	Method Blank	Total Recoverable	Water	6010C	505982
LCS 680-505935/2-A	Lab Control Sample	Total Recoverable	Water	6010C	505935
LCS 680-505982/2-A	Lab Control Sample	Total Recoverable	Water	6010C	505982
Prep Batch: 507971					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146972-1	GWE-3D-1217	Total Recoverable	Water	3005A	
680-146972-2	GWE-2D-1217	Total Recoverable	Water	3005A	
680-146972-3	CPA-MW-5D-1217	Total Recoverable	Water	3005A	
680-146972-4	CPA-MW-5D-1217	Total Recoverable	Water	3005A	
680-146972-5	CPA-MW-4D-1217	Total Recoverable	Water	3005A	
MB 680-507971/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-507971/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
Analysis Batch: 508 <sup>,</sup>	112				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-146972-1	GWE-3D-1217	Total Recoverable	Water	6010C	507971
680-146972-2	GWE-2D-1217	Total Recoverable	Water	6010C	507971
680-146972-3	CPA-MW-5D-1217	Total Recoverable	Water	6010C	507971
680-146972-4	CPA-MW-5D-1217	Total Recoverable	Water	6010C	507971
680-146972-5	CPA-MW-4D-1217	Total Recoverable	Water	6010C	507971
MB 680-507971/1-A	Method Blank	Total Recoverable	Water	6010C	507971
LCS 680-507971/2-A	Lab Control Sample	Total Recoverable	Water	6010C	507971

#### **General Chemistry**

#### Analysis Batch: 189992

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-146972-1	GWE-3D-1217	Total/NA	Water	SM 4500 CO2 C	
680-146972-2	GWE-2D-1217	Total/NA	Water	SM 4500 CO2 C	
680-146972-3	CPA-MW-5D-1217	Total/NA	Water	SM 4500 CO2 C	
680-146972-4	CPA-MW-5D-1217	Total/NA	Water	SM 4500 CO2 C	
680-146972-5	CPA-MW-4D-1217	Total/NA	Water	SM 4500 CO2 C	
680-146972-1 DU	GWE-3D-1217	Total/NA	Water	SM 4500 CO2 C	

#### Analysis Batch: 190007

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146972-1	GWE-3D-1217	Total/NA	Water	SM 2320B	
680-146972-2	GWE-2D-1217	Total/NA	Water	SM 2320B	
680-146972-3	CPA-MW-5D-1217	Total/NA	Water	SM 2320B	
680-146972-4	CPA-MW-5D-1217	Total/NA	Water	SM 2320B	
680-146972-5	CPA-MW-4D-1217	Total/NA	Water	SM 2320B	
MB 310-190007/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-190007/2	Lab Control Sample	Total/NA	Water	SM 2320B	

#### Analysis Batch: 506528

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-146392-2	GWE-3D-F(0.2)-1217	Dissolved	Water	415.1-1974	

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TestAmerica Job ID: 680-146392-1 SDG: KPS206

### General Chemistry (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
680-146392-4	GWE-2D-F(0.2)-1217	Dissolved	Water	415.1-1974	•
680-146392-6	CPA-MW-5D-F(0.2)-1217	Dissolved	Water	415.1-1974	
680-146392-8	BSA-MW-5D-F(0.2)-1217	Dissolved	Water	415.1-1974	
680-146392-11	CPA-MW-4D-F(0.2)-1217	Dissolved	Water	415.1-1974	
MB 680-506528/2	Method Blank	Dissolved	Water	415.1-1974	
LCS 680-506528/4	Lab Control Sample	Dissolved	Water	415.1-1974	
LCSD 680-506528/5	Lab Control Sample Dup	Dissolved	Water	415.1-1974	
nalysis Batch: 507	036				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
680-146972-1	GWE-3D-1217	Total/NA	Water	353.2-1993 R2.0	
680-146972-2	GWE-2D-1217	Total/NA	Water	353.2-1993 R2.0	
680-146972-3	CPA-MW-5D-1217	Total/NA	Water	353.2-1993 R2.0	
680-146972-4	CPA-MW-5D-1217	Total/NA	Water	353.2-1993 R2.0	
680-146972-5	CPA-MW-4D-1217	Total/NA	Water	353.2-1993 R2.0	
MB 680-507036/13	Method Blank	Total/NA	Water	353.2-1993 R2.0	
LCS 680-507036/16	Lab Control Sample	Total/NA	Water	353.2-1993 R2.0	
nalysis Batch: 507	316				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bato
680-146972-2	GWE-2D-1217	Total/NA	Water	415.1-1974	
680-146972-3	CPA-MW-5D-1217	Total/NA	Water	415.1-1974	
680-146972-4	CPA-MW-5D-1217	Total/NA	Water	415.1-1974	
680-146972-5	CPA-MW-4D-1217	Total/NA	Water	415.1-1974	
MB 680-507316/2	Method Blank	Total/NA	Water	415.1-1974	
LCS 680-507316/3	Lab Control Sample	Total/NA	Water	415.1-1974	
LCSD 680-507316/4	Lab Control Sample Dup	Total/NA	Water	415.1-1974	
680-146972-2 MS	GWE-2D-1217	Total/NA	Water	415.1-1974	
680-146972-2 MSD	GWE-2D-1217	Total/NA	Water	415.1-1974	
nalysis Batch: 507	320				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bate
680-146972-1	GWE-3D-1217	Total/NA	Water	415.1-1974	
MB 680-507320/2	Method Blank	Total/NA	Water	415.1-1974	
LCS 680-507320/3	Lab Control Sample	Total/NA	Water	415.1-1974	
LCSD 680-507320/4	Lab Control Sample Dup	Total/NA	Water	415.1-1974	
nalysis Batch: 507	400				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Bate
680-146972-1	GWE-3D-1217	Total/NA	Water	375.4-1978	
680-146972-2	GWE-2D-1217	Total/NA	Water	375.4-1978	
680-146972-3	CPA-MW-5D-1217	Total/NA	Water	375.4-1978	
680-146972-4	CPA-MW-5D-1217	Total/NA	Water	375.4-1978	
680-146972-5	CPA-MW-4D-1217	Total/NA	Water	375.4-1978	
MB 680-507400/4	Method Blank	Total/NA	Water	375.4-1978	
LCS 680-507400/5	Lab Control Sample	Total/NA	Water	375.4-1978	
LCSD 680-507400/7	Lab Control Sample Dup	Total/NA	Water	375.4-1978	
nalysis Batch: 507	401				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bate
680-146972-1	GWE-3D-1217	Total/NA	Water	325.2-1978	

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345 TestAmerica Job ID: 680-146392-1 SDG: KPS206

### General Chemistry (Continued)

#### Analysis Batch: 507401 (Continued)

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-146972-2	GWE-2D-1217	Total/NA	Water	325.2-1978	
680-146972-3	CPA-MW-5D-1217	Total/NA	Water	325.2-1978	
680-146972-4	CPA-MW-5D-1217	Total/NA	Water	325.2-1978	
680-146972-5	CPA-MW-4D-1217	Total/NA	Water	325.2-1978	
MB 680-507401/4	Method Blank	Total/NA	Water	325.2-1978	
LCS 680-507401/5	Lab Control Sample	Total/NA	Water	325.2-1978	
LCSD 680-507401/7	Lab Control Sample Dup	Total/NA	Water	325.2-1978	

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			L	an chird	Jucie				
Client: Solutia Project/Site: 40		/ Sampling - 140	3345				TestAi	merica Job	ID: 680-146392-1 SDG: KPS206
Client Samp Date Collected Date Received	d: 12/05/17 0	9:27					Lab Sa	mple ID:	680-146392-1 Matrix: Wate
	Batch	Batch	,	Dilution	Batch	Prepared			
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Analysis	8260B		20	505854	12/11/17 19:46	JLK	TAL SAV	
Client Samp Date Collecter Date Received	d: 12/05/17 0		1217				Lab Sa	ample ID:	680-146392-2 Matrix: Wate
_	Batch	Batch		Dilution	Batch	Prepared			
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Dissolved	Prep	3005A			505982	12/11/17 17:28	BCB	TAL SAV	
Dissolved	Analysis	6010C		1	506233	12/12/17 18:59	BWR	TAL SAV	
Dissolved	Analysis	415.1-1974		1	506528	12/13/17 14:08	KLD	TAL SAV	
Client Samp Date Collecter Date Received	d: 12/05/17 1	1:00					Lab Sa	ample ID:	680-146392- Matrix: Wate
	Batch	Batch		Dilution	Batch	Prepared			
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Analysis	8260B		1	505854	12/11/17 20:11	JLK	TAL SAV	
Client Samp Date Collected Date Received	d: 12/05/17 1		1217				Lab Sa	ample ID:	680-146392- Matrix: Wate
986 A	Batch	Batch		Dilution	Batch	Prepared			
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Dissolved	Prep	3005A			505982	12/11/17 17:28	BCB	TAL SAV	
Dissolved	Analysis	6010C		1	506233	12/12/17 18:23	BWR	TAL SAV	
Dissolved	Analysis	415.1-1974		1	506528	12/13/17 14:24	KLD	TAL SAV	
Client Samp Date Collecter Date Received	d: 12/05/17 1		17				Lab Sa	ample ID:	680-146392- Matrix: Wate
	Batch	Batch		Dilution	Batch	Prepared			
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Analysis	8260B		20	505854	12/11/17 20:36	JLK	TAL SAV	
Client Samj Date Collecter Date Receiver	d: 12/05/17 1		.2)-1217				Lab Sa	ample ID:	680-146392- Matrix: Wate
	Batch	Batch		Dilution	Batch	Prepared			
Ргер Туре	Туре	Method	Run	Factor	Number	•	Analyst	Lab	
Dissolved	Prep	3005A				12/11/17 17:28	-	TAL SAV	
Dissolved	Analysis	6010C		1	506233	12/12/17 18:54	BWR	TAL SAV	
<b>D</b> : 1 1									

Dissolved

Analysis

415.1-1974

Lab Chronicle

TAL SAV 550 21M/18 TestAmerica Savannah 5

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506528 12/13/17 14:41 KLD

ojoorono. ram	LTM GW	Sampling - 140	3345				TestAr	nerica Job	ID: 680-146392-1 SDG: KPS206
lient Sample	ID: BSA	-MW-5D-121	7				Lab Sa	mple ID:	680-146392-7
ate Collected: 1 ate Received: 1	2/05/17 1	3:50	-						Matrix: Water
-	Batch	Batch		Dilution	Batch	Prepared			
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Analysis	8260B		1	505854	12/11/17 21:00	JLK	TAL SAV	
lient Sample	ID: BSA	-MW-5D-F(0	.2)-1217				Lab Sa	mple ID:	680-146392-8
Date Collected: 1 Date Received: 1	2/05/17 1	3:50						·	Matrix: Water
	Batch	Batch		Dilution	Batch	Prepared			
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Dissolved	Prep	3005A			505982	12/11/17 17:28	BCB	TAL SAV	
Dissolved	Analysis	6010C		1	506233	12/12/17 18:38	BWR	TAL SAV	
Dissolved	Analysis	415.1-1974		1	506528	12/13/17 14:57	KLD	TAL SAV	
Client Sample	ID: 470	17 Trin Blan	k #2				l ah Sa	mple ID:	680-146392-9
Date Collected: 1 Date Received: 1	2/05/17 0	0:00							Matrix: Water
-	Batch	Batch		Dilution	Batch	Prepared			
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Analysis	8260B			505854	12/11/17 16:29	JLK	TAL SAV	
hata Callastadi 4	2/05/17 1	5:25							Matrix: Water
	2/06/17 0	9:20							
Date Received: 1	2/06/17 09 Batch	9:20 Batch		Dilution	Batch	Prepared			
Date Received: 1		Batch Method	Run	Dilution Factor	Number	or Analyzed	Analyst	Lab	
Date Received: 1	Batch	Batch	Run		Number	•	-	Lab TAL SAV	
Date Received: 1 Prep Type Total/NA Client Sample Date Collected: 1	Batch Type Analysis ID: CPA	Batch Method 8260B A-MW-4D-F(0 5:25		Factor	Number	or Analyzed 12/11/17 16:54	JLK	TAL SAV	580-146392-11 Matrix: Water
Date Received: 1 Prep Type Total/NA Client Sample Date Collected: 1	Batch Type Analysis ID: CPA	Batch Method 8260B A-MW-4D-F(0 5:25		Factor	Number	or Analyzed 12/11/17 16:54	JLK	TAL SAV	680-146392-11
Date Received: 1 Prep Type Total/NA Client Sample Date Collected: 1	Batch Type Analysis ID: CPA 2/05/17 1 2/06/17 0	Batch Method 8260B A-MW-4D-F(0 5:25 9:20		Factor 1	Number 505854	or Analyzed 12/11/17 16:54	JLK	TAL SAV	680-146392-11
Date Received: 1 Prep Type Total/NA Client Sample Date Collected: 1 Date Received: 1	Batch Type Analysis ID: CPA 2/05/17 1 2/06/17 0 Batch	Batch Method 8260B A-MW-4D-F(0 5:25 9:20 Batch	.2)-1217	- Factor 1	Number 505854 Batch Number	or Analyzed 12/11/17 16:54 L Prepared	JLK .ab San	TAL SAV	680-146392-11
Date Received: 1 Prep Type Total/NA Client Sample Date Collected: 1 Date Received: 1 Prep Type	Batch Type Analysis ID: CPA 2/05/17 1 2/06/17 0 Batch Type	Batch Method 8260B A-MW-4D-F(0 5:25 9:20 Batch Method	.2)-1217	- Factor 1	Number 505854 Batch Number 505982	or Analyzed 12/11/17 16:54 L Prepared or Analyzed	JLK .ab San Analyst BCB	TAL SAV	680-146392-11
Date Received: 1 Prep Type Total/NA Client Sample Date Collected: 1 Date Received: 1 Prep Type Dissolved	Batch Type Analysis ID: CPA 2/05/17 1 2/06/17 0 Batch Type Prep	Batch Method 8260B A-MW-4D-F(0 5:25 9:20 Batch Method 3005A	.2)-1217	Factor       1       Dilution       Factor	Number           505854           Batch           Number           505982           506233	or Analyzed 12/11/17 16:54 L Prepared or Analyzed 12/11/17 17:28	JLK .ab San Analyst BCB BWR	TAL SAV nple ID: ( Lab TAL SAV	680-146392-11
Date Received: 1 Prep Type Total/NA Client Sample Date Collected: 1 Date Received: 1 Prep Type Dissolved Dissolved Dissolved Client Sample Date Collected: 1	Batch Type Analysis ID: CPA 2/05/17 1 2/06/17 0 Batch Type Prep Analysis Analysis Analysis	Batch Method 8260B A-MW-4D-F(0 5:25 9:20 Batch Method 3005A 6010C 415.1-1974 E-3D-1217 9:27	.2)-1217	Factor       1       1       1       1       1       1       1	Number           505854           Batch           Number           505982           506233	or Analyzed 12/11/17 16:54 L Prepared or Analyzed 12/11/17 17:28 12/12/17 18:13	Analyst BCB BWR KLD	TAL SAV nple ID: ( TAL SAV TAL SAV TAL SAV TAL SAV	680-146392-11
Date Received: 1 Prep Type Total/NA Client Sample Date Collected: 1 Date Received: 1 Prep Type Dissolved Dissolved Dissolved Client Sample Date Collected: 1	Batch Type Analysis ID: CPA 2/05/17 1 2/06/17 0 Batch Type Prep Analysis Analysis Analysis	Batch Method 8260B A-MW-4D-F(0 5:25 9:20 Batch Method 3005A 6010C 415.1-1974 E-3D-1217 9:27	.2)-1217	Factor       1       1       1       1       1       1       1	Number           505854           Batch           Number           505982           506233	or Analyzed 12/11/17 16:54 L Prepared or Analyzed 12/11/17 17:28 12/12/17 18:13	Analyst BCB BWR KLD	TAL SAV nple ID: ( TAL SAV TAL SAV TAL SAV TAL SAV	680-146392-11 Matrix: Water 680-146972-1
Date Received: 1 Prep Type Total/NA Client Sample Date Collected: 1 Date Received: 1 Prep Type Dissolved Dissolved Dissolved Client Sample Date Collected: 1	Batch Type Analysis ID: CPA 12/05/17 1 2/06/17 0 Batch Type Prep Analysis Analysis Analysis ID: GW 12/05/17 0 2/15/17 1	Batch Method 8260B A-MW-4D-F(0 5:25 9:20 Batch Method 3005A 6010C 415.1-1974 E-3D-1217 9:27 7:10	.2)-1217	Factor 1 Dilution Factor 1 1	Number 505854 Batch Number 505982 506233 506528	or Analyzed 12/11/17 16:54	Analyst BCB BWR KLD	TAL SAV nple ID: ( TAL SAV TAL SAV TAL SAV TAL SAV	680-146392-11 Matrix: Water 680-146972-1
Date Received: 1 Prep Type Total/NA Client Sample Date Collected: 1 Date Received: 1 Prep Type Dissolved Dissolved Dissolved Client Sample Date Collected: 1 Date Received: 1	Batch           Type           Analysis           ID: CP4           2/05/17 1           2/06/17 0           Batch           Type           Prep           Analysis           Analysis           ID: GW           12/05/17 1           2/06/17 0           2/06/17 0           Analysis           ID: GW           12/05/17 0           2/15/17 1           Batch	Batch Method 8260B A-MW-4D-F(0 5:25 9:20 Batch Method 3005A 6010C 415.1-1974 E-3D-1217 9:27 7:10 Batch	.2)-1217	Factor 1 Dilution Factor 1 1 1 Dilution	Number           505854           Batch           Number           505982           506233           506528           Batch	or Analyzed 12/11/17 16:54 L Prepared or Analyzed 12/11/17 17:28 12/12/17 18:13 12/13/17 15:14 Prepared	JLK .ab San Analyst BCB BWR KLD Lab Sa Analyst	TAL SAV	680-146392-11 Matrix: Water 680-146972-1
Date Received: 1 Prep Type Total/NA Client Sample Date Collected: 1 Date Received: 1 Dissolved Dissolved Dissolved Client Sample Date Collected: 1 Date Received: 1 Date Receive	Batch           Type           Analysis           ID: CPA           2/05/17 1           2/06/17 0           Batch           Type           Prep           Analysis           Analysis           ID: GW           12/05/17 0           2/06/17 0           2/06/17 0           Analysis           ID: GW           12/05/17 0           2/15/17 1           Batch           Type	Batch Method 8260B A-MW-4D-F(0 5:25 9:20 Batch Method 3005A 6010C 415.1-1974 E-3D-1217 9:27 7:10 Batch Method	.2)-1217	Factor 1 Dilution Factor 1 1 1 Dilution Factor	Number 505854 Batch Number 505982 506528 506528 Batch Number	or Analyzed 12/11/17 16:54 L Prepared or Analyzed 12/11/17 17:28 12/12/17 18:13 12/13/17 15:14 Prepared or Analyzed 12/19/17 10:58	JLK Analyst BCB BWR KLD Lab Sa Analyst KAB	TAL SAV nple ID: ( TAL SAV TAL SAV TAL SAV TAL SAV mple ID: Lab	680-146392-11 Matrix: Water 680-146972-1
Date Received: 1 Prep Type Total/NA Client Sample Date Collected: 1 Date Received: 1 Dissolved Dissolved Dissolved Client Sample Date Collected: 1 Date Received: 1 Prep Type Total/NA	Batch Type Analysis ID: CPA 2/05/17 1 2/06/17 0 Batch Type Prep Analysis Analysis Analysis ID: GW 2/05/17 0 2/15/17 1 Batch Type Analysis	Batch Method 8260B A-MW-4D-F(0 5:25 9:20 Batch Method 3005A 6010C 415.1-1974 E-3D-1217 9:27 7:10 Batch Method RSK-175	.2)-1217	Factor 1 Dilution Factor 1 1 1 Dilution Factor	Number           505854           Batch           Number           505982           506233           506528           Batch           Number           506930           507971	or Analyzed 12/11/17 16:54 L Prepared or Analyzed 12/11/17 17:28 12/12/17 18:13 12/13/17 15:14 Prepared or Analyzed 12/19/17 10:58	JLK Analyst BCB BWR KLD Lab Sa Analyst KAB AJR	TAL SAV nple ID: ( TAL SAV TAL SAV TAL SAV TAL SAV Imple ID: Lab TAL SAV	680-146392-11 Matrix: Water 680-146972-1

TestAmerica Savannah

TestAmerica Job ID: 680-146392-1 SDG: KPS206

Lab Sample ID: 680-146972-1

# Client Sample ID: GWE-3D-1217 Date Collected: 12/05/17 09:27 Date Received: 12/15/17 17:10

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	325.2-1978		50	507401	12/21/17 11:06	ALG	TAL SAV
Total/NA	Analysis	353.2-1993 R2.0		1	507036	12/19/17 13:20	AMH	TAL SAV
Total/NA	Analysis	375.4-1978		20	507400	12/21/17 10:35	ALG	TAL SAV
Total/NA	Analysis	415.1-1974		1	507320	12/20/17 18:10	KLD	TAL SAV
Total/NA	Analysis	SM 2320B		1	190007	12/26/17 19:08	BER	TAL CF
Total/NA	Analysis	SM 4500 CO2 C		1	189992	12/26/17 11:04	LBB	TAL CF

## Client Sample ID: GWE-2D-1217 Date Collected: 12/05/17 11:00 Date Received: 12/15/17 17:10

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175			506930	12/19/17 11:11	KAB	TAL SAV
Total Recoverable	Prep	3005A			507971	12/28/17 10:43	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1	508112	12/29/17 03:01	BCB	TAL SAV
Total/NA	Analysis	325.2-1978		20	507401	12/21/17 11:06	ALG	TAL SAV
Total/NA	Analysis	353.2-1993 R2.0		1	507036	12/19/17 13:21	AMH	TAL SAV
Total/NA	Analysis	375.4-1978		50	507400	12/21/17 10:35	ALG	TAL SAV
Total/NA	Analysis	415.1-1974		1	507316	12/20/17 19:23	KLD	TAL SAV
Total/NA	Analysis	SM 2320B		1	190007	12/26/17 19:08	BER	TAL CF
Total/NA	Analysis	SM 4500 CO2 C		1	189992	12/26/17 11:10	LBB	TAL CF

#### Client Sample ID: CPA-MW-5D-1217 Date Collected: 12/05/17 12:20 Date Received: 12/15/17 17:10

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	506930	12/19/17 11:24	KAB	TAL SAV
Total Recoverable	Prep	3005A			507971	12/28/17 10:43	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1	508112	12/29/17 02:44	BCB	TAL SAV
Total/NA	Analysis	325.2-1978		5	507401	12/21/17 11:06	ALG	TAL SAV
Total/NA	Analysis	353.2-1993 R2.0		1	507036	12/19/17 13:23	AMH	TAL SAV
Total/NA	Analysis	375.4-1978		5	507400	12/21/17 10:24	ALG	TAL SAV
Total/NA	Analysis	415.1-1974		1	507316	12/20/17 20:08	KLD	TAL SAV
Total/NA	Analysis	SM 2320B		1	190007	12/26/17 19:08	BER	TAL CF
Total/NA	Analysis	SM 4500 CO2 C		1	189992	12/26/17 11:14	LBB	TAL CF

# Lab Sample ID: 680-146972-2

Matrix: Water

Matrix: Water

## Lab Sample ID: 680-146972-3 Matrix: Water

SSD 2/14/18 TestAmerica Savannah

Batch

Prepared

506930 12/19/17 11:36 KAB

507971 12/28/17 10:43 AJR

508112 12/29/17 02:49 BCB

or Analyzed

Analyst

Lab

TAL SAV

TAL CF

TAL CF

TestAmerica Job ID: 680-146392-1 SDG: KPS206

# Client Sample ID: CPA-MW-5D-1217

## Lab Sample ID: 680-146972-4 Matrix: Water

#### Date Collected: 12/05/17 13:50 Date Received: 12/15/17 17:10 Batch Batch Dilution Prep Type Method Type Run Factor Number **RSK-175** Total/NA 1 Analysis **Total Recoverable** Prep 3005A **Total Recoverable** Analysis 6010C 1

Total/NA	Analysis	325.2-1978	5	507401	12/21/17 11:06 A	LG
Total/NA	Analysis	353.2-1993 R2.0	1	507036	12/19/17 13:26 A	MH
Total/NA	Analysis	375.4-1978	1	507400	12/21/17 10:00 A	١LG
Total/NA	Analysis	415.1-1974	1	507316	12/20/17 20:24 K	(LD
Total/NA	Analysis	SM 2320B	1	190007	12/26/17 19:08 B	ER
Total/NA	Analysis	SM 4500 CO2 C	1	189992	12/26/17 11:17 L	BB
hanna						

#### Client Sample ID: CPA-MW-4D-1217 Date Collected: 12/05/17 15:25 Date Received: 12/15/17 17:10

# Lab Sample ID: 680-146972-5

Matrix: Wa	ter
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	Batch	Batch		Dilution	Batch	Prepared		
Prep Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	506930	12/19/17 11:49	KAB	TAL SAV
Total Recoverable	Prep	3005A			507971	12/28/17 10:43	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1	508112	12/29/17 02:53	BCB	TAL SAV
Total/NA	Analysis	325.2-1978		5	507401	12/21/17 11:06	ALG	TAL SAV
Total/NA	Analysis	353.2-1993 R2.0		1	507036	12/19/17 13:27	AMH	TAL SAV
Total/NA	Analysis	375.4-1978		1	507400	12/21/17 10:21	ALG	TAL SAV
Totai/NA	Analysis	415.1-1974		1	507316	12/20/17 20:41	KLD	TAL SAV
Total/NA	Analysis	SM 2320B		1	190007	12/26/17 19:08	BER	TAL CF
Total/NA	Analysis	SM 4500 CO2 C		1	189992	12/26/17 11:18	LBB	TAL CF

#### Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

53D 2/14/18 TestAmerica Savannah

220339 TestAmerica Laboratories, Inc. TestAmerica Laboratories, Inc.	12/5/17 [COC No:	Fader 1	Sampler: AUF	For Lab Use Only:	Vvalk-In Client, Lab Sampling:	Job / SDG No.:		Sample Specific Notes:									680-146392 Chain of Custody				od K constant statistical franch	טמווידים הואסטמו (א ובפיווופל הפימטאטרט וו אמווידים מופירמוורט ווחוקפר נחמו דו וחסואה)	Lab Carchive For Months	) 2 · Q	Corrd: Therm ID No :	Company: Date/Time:	Company: Date/Time.	Company: Date/Time:
Chain of Custody Record Itanta 681-A	L. Lo Site Contact:	Lab Contact: Midele Kersen		52	()	9 4 1'. 1'. 52 52 52 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	5 2 2 2 3 1 1 3	Matrix Cont. Hilested Sa Matrix Cont. Hilested Sa Perform M Vist Sa Perform M Perform M Perfo	E	1 4 7 1 1 3	M W 3111 32 3	4 7 1 13	14 N 3 1 1 1 3 2 3	4 Y 1 13	14 W 3 11 1 3 2 3	4 4 1 13	8 N 3 ++++-3 2 3 74	<b>S</b> W 3	2 1 2	W 14 N 3111 323	Samula Disensed / A faa mau ha secared	odes for the sample in the	L. Return to Client	2.0-1015.r	Cooler Temp. (°C): Obs'd.	Date/Time. Received by:	Received by,	Date/Time: Received in Laboraboa.
681-A		-724-919	1 .	CALENDAR DAYS WORKING DAYS	TAT # different from Balow Spreak			Sample Sample (c=Comp. Date Time G=Crab) Ma	5		0011	ETT EN	0221		1350			7		145/17 1525 6	<b>"</b>	Please List any EPA Waste Codes for the s	Poison B Unknown		Custody Seal No.:	Company: Company: 124		Company: Dat
TestAmerica Savannah Sidz Lakoche Avenue Suite C-10 Sinte C-10	Client Contact	Company Name: Gilder Assessed	in SI #10	City/State/Zip: 54 Charles, NO 63341	Phone: 636-724-7(4) Fax:	Project Name: 4217 LTM 6 2 Smally - No 335	+ 42262863	Sample Identification	6406-30-1217	6WE-3D-F/0.2)-1217	6WE-2D-1217	6WE-2D-Floit>-1217	CPH-MW-5D-1217	20 PA- WW 5/6: 2 - 121- 20 - 5/612)-1217	B54-MW-5D-1217	854- MW-Flored -1217-50-Flored -1217	854-MW-57-1217-45	BSH- MW-50-1217-1150	4ary Tris Black #2	B.M- MW- 40-1217	1000 100	A Hazardous Waste? dispose of the sample.	Kon-Hazard	Special Instructions/QC Requirements & Comments:	Custody Seals Intact: Custody Seals Intact:	Relinquished by March	Relinquished by:	Relinquished by:

220337 TestAmerica	THE LEADER IN ENVIRONMENTAL TESTING TestAmerics & aboratories. Inc.		COC No:	der 2 of 2 cocs	Sampler: AL	Por Lab Use Uniy: Walk-in Client:	Lab Sampling: Job / SDG No.:	Sample Specific Notes:								amples are retained longer than 1 month)	Carchive for Months		Corr'd: Therm ID No .:	any: Date/Time:	any: Date/Time: -	Par Date/Tiple: Date/Tiple:	
Chain of Custody Record 220	681-Atlanta	C other:	Swath Dilaro	ntact: Milbele Keedery Carrier: Fey	2		וציר גר קסור		3							Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)	Return to Client	O. JIS CCF-D. SIL.O	Coaler Temp. ("C): Obs'd:	Received by. Company:	Received by: Company.	Received in Laboratory Company.	
	681-Atlanta	rogram	And Deple	6.36-774-7171 Lab Contact:	Turnard	I from Below Shared Z	/ λ ) QSW (N / λ ) ald	1 day Sample Type (c=comp, # of \$0 \$0 (c=comp, Matrix Cont. [[] @ protection (a=certection)	- 6 10 4						36	te Codes for the sample in the	Unknown	6		Date/Time'	and some of the local division of the local	Date/Time: Rece	5
n 680-146.		Regulatory Program:	Project Mar	S Tel/Fax:		C33 ¢ 1 LVCALENDAR DAYS	Sumplier trast	Sample Sample Date Time							H2SO4; 4=HNO3; 5=NaOH; 6= Othe	ious Waste? Please List any EPA Waste	Skin Irritant 🗌 Poison B	& Comments:	Custody Seal No.		Company.	Company	
TestAmerica Savaman 680-146392	Suite C-10 Suite C-10	Savannan, 68 31404 Phone: 912.354.7858 Far:	Client Cont	bolder	5 Ruis	City/State/Zip: 54 (1-16) 100 Phone: 636-727-9191	CTM 6W	Sample Identification	85A-MW-40-F/0.2)-12		Pe	 5 of	54		Preservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other	Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Comments Section if the lab is to dispose of the sample.	Vion-Hazard	Special Instructions/QC Requirements & Comments:	Custody Seals Intact:	Religenstred by Annul	Relinquished by	Relinquished by:	

5102 LaNoche Avenue Swite C-18 Sevammath, 6A 31404		631-Allan		TestAmerica Laboratories, Inc.
Fax; Contact	Project Managor:		Site Contact: Some Dire.	
as Assertates S	TeliFax: 634 724	1516-	Lab Contact: Middle Kay see Carrier: Foll'>	C
510 5 Neir SI #100 670. 51 66-65, NO 63701 636-724-5191	Analysis Turnarou V. Alendar Davs W 7A1 & pulgrent from Elotow	TURNAROUND TIME WORKING DAYS		Sampler KUF For Lab Use Only: Walk-in Chent Lah Sambino
Julie 4217 LTM bu Smaller Mossis	J SEVE	£	1'51 - 1'51 - 1'52 - 1'52 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	Job r SDG No
Sample Identification	Sample Sample (Cu Date Time Co	Type (Cocomp Gocomp Gocomp Marrix Cont	1)2 E	Sample Specific Notes
	1260 L/2/21	23	W 3 1 1 1 3 2 3	
7/0.1/-1217	T	1 1	1 2	
6105-20-1217	1100	H	W 3 [1   32 3	
6w1 - 2D- Floir) - 1217		27	Υ	
PM-MW-5D-1217	1220	14	W 3111323	
(PA- 112)-15/2-1212-1212-5-1212-1217	-	4	y 1 3	
BS4-MW-50-1217	1350	11	V 3 111 3 2 3	
RSH-MW-Flores -1947-50-Flois)-1217		3-	13	
85A - MW-5D-1217-MS		69	N 3 ++++-3 2 3 76	tain of Custody
854 - HW-5D-121-7-125D	-1	69	W 3	
Tile Blevke +2	1	L 1 2	2 2 2	
HW- 40-1217	14/2/12 1525	G W 14	W 3 111 3 2 3	
Preservation Used: 1= ics, 2= HCi; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Othe	5=NaOH; 6= Other			
Possible Hazard Identification: Are any sampler from a listed EPA Hazardous Waste? Plense List any EPA Waste Codes for the sample in the Comments Section if the lath is to dispose of the sample	e Lusi Briy ElPa, Waste Coo	les for the semple in t	Sample Disposal ( A lee may be assessed if samples are relained longer than 1 month) for	elained longer than 1 month)
righting See Heline	Plantan B	Untrown	Return to Client Disposal by Lab Archive for	ve for
Special Instructions/GC Requirements & Comments:			5 2(5 D- J) 2 2	(++)(++)
Custody Seals Intact Yest to	Custody Seal No		Cooler Temp ("C) Obsid Corrid	Therm ID No
( Sord &	Company	Date/Fime	Received by Company	Date/Time
	Сопрацу	Date/fune	Reserved by Company	Date First + 170
	Сонрыну	Date/Time	Received in Laboratory In Company	DaterTime 17/1/11 Che 20

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680-146972 Chain of Custody

TestAmerico

THE LEADER IN ENVIRONMENTAL TESTING

# Cooler/Sample Receipt and Temperature Log Form

Client Information	8. <sup>3</sup> . 4	The second second second second
Client: TA- Savannah		
City/State:	STATE A	Project:
Receipt Information		
Date/Time Received:   12/23/17	1005	Received By: URH
Delivery Type: UPS X FedI	Ex Sut Del	FedEx Ground US Mail Spee-Dee
🗌 TA Courier 🔲 TA F	ield Services	Client Drop-off Other:
Condition of Cooler/Containers	r Alberton	· · · · · · · · · · · · · · · · · · ·
Sample(s) received in Cooler?		If yes: Cooler ID:
Multiple Coolers?	s 🛛 No	If yes: Cooler # of
Cooler Custody Seals Present? Ye	S X NO WA	y f yes: Cooler custody seals intact? 🕅 Yes 🗌 No
Sample Custody Seals Present?	s 🔀 No	If yes: Sample custody seals intact? Yes No
Trip Blank Present?	s X No	If yes: Which VOA samples are in cooler? 1
Coolant: Wet ice Blue ice Thermometer ID: T	Dry ici	Correction Factor (°C): +0.1
Temp Blank Temperature – If no temp blank, or	r temp blank tem	perature above criteria, proceed to Sample Container Temperature 🕏
Uncorrected Temp (°C): (), ]		Corrected Temp (°C): 0.4
• Sample Container Temperature (204-13-3) Sample ID(s) & bottle type used: 1	111 H: 42 823, 1(3) 1013-1	CONTAINER 2
and the second se	TENP 2	Corrected Temp (°C): TEMP1
Exceptions Noted	家的毛肤的阳	
<ol> <li>If temperature exceeds criteria, was</li> <li>a) If yes: Is there evidence that the</li> </ol>		
<ol> <li>If temperature is &lt;0°C, are there obv (e.g., bulging septa, broken/cracked</li> </ol>	vious signs that bottles?)	at the integrity of sample containers is compromised?
Note: If yes, contact PM before proceeding.	If no, proceed w	ith login
Additional Comments	<b>建国际和</b> 国际	
Document: CF-LG-WI-002 Revision: 22		

Revision: 22 Date: 11/27/2015

TestAmerica-Cedar Falls Page 48 of 54 General temperature criteria is 0 to 6°C Bacteria temperature criteria is 0 to 10°C SSD 2/14/18

TestAmerica Savannah 5102 LaRoche Avenue		hoin	Chain of Custody Docord	od vbo	prove						Testy	TestAmerico	0
Sevanneh, GA 31404 Phone (A12) 344–7858 Fax (912) 352–0165	,		icuo i	ouy w							THE LEADER	THE LEADER IN ENVIRONMENTAL TESTING	TESTING
Client Information (Sub Contract Lab)	Sampler:			Kerse	Lab PM: Kersey, Michele R	R		Carrier Tr	Carrier Tracking No(s):		COC No. 680-502683.1	1	
Cliant Conlact: Shippling/Receiving	Phone:			E-Mail; miche	ile.kersey	Øtestame	E-Mail: michele.kersey@testamericainc.com	State of Origin Illinois	Drigin:		Page: Page 1 of 1		
Cempany TestAmerica Laboratories, Inc					VELAP -	Accreditations Required (See note) NELAP - Ittinols	Sek note):				Job #: 680-146972-	4.	
Addrass. 704 Enterprise Drive.	Due Date Requested: 12/26/2017	d:					Analysis	Analysis Requested	T		Preservation Codes:	÷.	
City. Cedar Falls State, Zp:	B	(days):									A - HUL B - NaOH C - Zh Acotale D - Nitric Acid E - NaHSO4	M - TEXARE M - None O - AsNaO2 P - Na2O4S O - Na2SO3	
Phone: Phone: 319-277-2401(Tel) 319-277-2425(Fax)	PO #				(0	50)					F - MaOH G - Amchlar H - Ascorbic Ac		shydrate
	MO #					YlanA				S.			
Project Name WGK Long Term Monitoring (LTM)	Project #: 68001754					(oob				ienistr	K-EDTA L-EDA	W - pH 4-5 Z - ather (speci	8
Site	\$SOW#				sD (X					103 <b>1</b> 0	Other:		
	Comula Data	Sample	Sample Type (C=comp,	and the second se	benetii7 biei Mi2M mitohet Mi2M mitohet	27202_00256				Total Number		Snerial Instructions.Note	ě
		X			X	6							
GWE-3D-1217 (680-146972-1)	12/5/17	09:27 Central		Water	×	×				-			
GWD-2D-1217 (680-146972-2)	12/5/17	11:00 Central		Water	×	×				**			
CPA-MW-5D-1217 (680-146972-3)	12/5/17	12:20 Central		Water	×	×				F			
BSA-MW-5D-1217 (680-146972-4)	12/5/17	13:50 Central		Water	×	×				-			
BSA-MW-4D-1217 (680-146972-5)	12/5/17	15:25 Central		Water	×	×				-			
Note: Since laboratory accreditations are subject to change. TestAmenca Laboratories, inc. places the ownership of method, analyte & accreditation compliance upon and subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditations are subject to change. TestAmenca Laboratory of matrix boing analytes & accreditation compliance upon and subcontract laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratory or other instruction immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratores, inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratory of the too accreditation are current to date. return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratory of the current to date. Return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratory attest. Allow	boratories, inc. places the c sitestatmatrix being analyze current to date, return the si	wnership of m d, the samptes gred Chain of (	athod, anolyte & must be ahippe Custody stiestim	accreditation of a back to the T	compliance u estAmerica icance to Te	pon aut sub laboratory of slAmerica Li	contract laboratori other instructions iboratories, Inc.	es. This sample will be provided	a shipment is fo	warded under to accreditation	r chain-of-custody on status should t	<ul> <li>If the laboratory doc</li> <li>be brought to TestAm</li> </ul>	es not arica
Possible Hazard Identification					Sample	Disposa	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)	be assessed	if samples	are retain	ed longer tha	in 1 month)	ľ
Unconfirmed Determenter Development 11, 111, 03 Abor (encodin)	Primary Dalivara	arahla Rank <sup>,</sup> 2			Special	Return To Client I Instructions/OC	Return To Client Dist	Disposal By Lab	By Leb	Arch	Archive For	Months	T
Leiverabie Kequesteu: 1, 11, 111, 117, Other (specify)		012 1/21 IV. 2			nondo.								
Enterty Relinquished by:		Date;			Time:			Men	Method of Shipmant:	t.			
Relinquéred by	12/22/17	142	a la	Company	Reci	Received by:	Put R	Y	Datert	DaterTime: 12/23	3/17 1003	H Human	,GF
Reinokulahidi by:	Date/Time.	,	<u>8</u>	Company	Raci	Racewod by:			Date/Time	18: 1		Company	
Ruinquished by:	Date/Time:		8	Сотралу	Rec	Received by:			Dale/Time.	78.		Company	
ody Seals					Cool	ar Temperat	Cooler Temperature(s) °C and Other Remarks	K Remarks:					
A Yes A No					-							Ver: 09/20/2016	16
						1	Contraction of the second	2 Constrained in the	time the second	and a second second	and the second	and a second second	A Management of

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55D 2114/18

# Login Sample Receipt Checklist

Client: Solutia Inc.

#### Login Number: 146392 List Number: 1 Creator: Edwards, Jessica R

Creator: Edwards, Jessica R		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td><i>x</i> <sup>1</sup></td>	N/A	<i>x</i> <sup>1</sup>
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Missing cooler containing MNA parameters
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 680-146392-1 SDG Number: KPS206

List Source: TestAmerica Savannah



# Login Sample Receipt Checklist

Client: Solutia Inc.

#### Login Number: 146972 List Number: 1 Creator: Chamberlain, Kim A

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	IDs on containers do not match the COC. Logged in per COC.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 680-146392-1 SDG Number: KPS206 List Source: TestAmerica Savannah

500 2/14/18

# Login Sample Receipt Checklist

Client: Solutia Inc.

Login Number: 146972 List Number: 2 Creator: Hummel, Matt R Job Number: 680-146392-1 SDG Number: KPS206

#### List Source: TestAmerica Cedar Falls List Creation: 12/23/17 10:40 AM

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# **Accreditation/Certification Summary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

# Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program AFCEE	EPA Region	Identification Number SAVLAB	Expiration Date
Alabama	State Program	4	41450	06-30-18
Alaska	State Program	10		06-30-18
Alaska (UST)	State Program	10	UST-104	09-22-19
Arizona	State Program	9	AZ0808	12-14-18
Arkansas DEQ	State Program	6	88-0692	02-01-19
California	State Program	9	2939	06-30-18
Colorado	State Program	8	N/A	12-31-18
Connecticut	State Program	1	PH-0161	03-31-19
Florida	NELAP	4	E87052	06-30-18
GA Dept. of Agriculture	State Program	4	N/A	06-12-18
Georgia	State Program	4	803	06-30-18
Guam	State Program	9	15-005r	04-16-18
Hawaii	State Program	9	N/A	06-30-18
Illinois	NELAP	5	200022	11-30-18
Indiana	State Program	5	N/A	06-30-18
lowa	State Program	5 7	353	06-30-19
Kentucky (DW)	State Program	4	90084	12-31-18
Kentucky (UST)	State Program	4	18	06-30-18
Kentucky (WW)	State Program	4	90084	12-31-18 *
L-A-B	DoD ELAP	7	L2463	09-22-19
L-A-B	ISO/IEC 17025		L2463.01	09-22-19
Louisiana	NELAP	6	30690	06-30-18
Louisiana (DW)	NELAP	6	LA160019	12-31-18
Maine	State Program	1	GA00006	09-24-18
Maryland	State Program	3	250	12-31-18
Massachusetts	State Program	1	M-GA006	06-30-18
Michigan	State Program	5	9925	06-30-18
Mississippi	State Program	4	9925 N/A	06-30-18
Nebraska	State Program	7	TestAmerica-Savannah	06-30-18
New Jersey	NELAP	2	GA769	06-30-18
New Mexico	State Program	6	N/A	06-30-18
New York	NELAP	2	10842	03-31-18
North Carolina (DW)	State Program	4	13701	07-31-18
North Carolina (WW/SW)	State Program	4	269	12-31-18
Okiahoma	State Program	6	9984	08-31-18
	NELAP	3	9904 68-00474	06-30-18
Pennsylvania Puerto Rico	State Program	5 2		
South Carolina	State Program	-	GA00006	12-31-18
		4	98001 TN02061	06-30-18
Tennessee	State Program	4	TN02961	06-30-18
Texas	NELAP State Brogram	6	T104704185-16-9	11-30-18
Texas	State Program	6	T104704185	06-30-18
US Fish & Wildlife	Federal		LE058448-0	07-31-18
USDA Virginia	Federal	0	SAV 3-04	06-14-20 *
Virginia	NELAP	3	460161	06-14-18
	State Program	10	C805	06-10-18
West Virginia (DW)	State Program	3	9950C	12-31-18
West Virginia DEP	State Program	3	094	06-30-18
Wisconsin	State Program State Program	5	999819810	08-31-18

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Savannah SJD 2/14/18

# **Accreditation/Certification Summary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

## TestAmerica Job ID: 680-146392-1 SDG: KPS206

# Laboratory: TestAmerica Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	IHLAP		101044	11-01-18
Georgia	State Program	4	IA100001 (OR)	09-29-18
Illinois	NELAP	5	200024	11-29-18
lowa	State Program	7	007	12-01-17 *
Minnesota	NELAP	5	019-999-319	12-31-18
Minnesota (Petrofund)	State Program	1	3349	08-22-18
North Dakota	State Program	8	R-186	09-29-18
Oregon	NELAP	10	IA100001	09-29-18

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Savannah 33D 2/14/18



#### Level IV Data Validation Summary Solutia Inc., W.G. Krummrich, Sauget, Illinois 4Q17 Long-Term Monitoring Program

Company Name: <u>Golder Associates</u> Project Name: <u>WGK-4Q17 LTM</u> Reviewer: <u>S. DiCenso</u> Laboratory: <u>TestAmerica</u> SDG#: <u>KPS200</u> Matrix: Water Project Manager: <u>A. Derhake</u> Project Number: <u>140-3345</u> Sample Date: <u>December 2017</u>

Analytical Method: VOC (8260B), Dissolved Gases (RSK-175), Metals (6010C), Alkalinity (310.1 and SM 2320B), Carbon Dioxide (SM 4500 CO2C), Chloride (325.2), Nitrogen, Nitrate-Nitrite (353.2), Sulfate (375.4), TOC (415.1), and DOC (415.1)

Sample Names: <u>BSA-MW-4D-1217, BSA-MW-4D-F(0.2)-1217, BSA-MW-3D-1217, BSA-MW-3D-F(0.2)-1217, BSA-MW-3D-1217-EB,</u> <u>BSA-MW-2D-1217, BSA-MW-2D-F(0.2)-1217, CPA-MW-3D-1217, CPA-MW-3D-F(0.2)-1217, CPA-MW-3D-1217-AD, CPA-MW-1D-1217, CPA-MW-1D-F(0.2)-1217, 4Q17 LTM Trip Blank #3</u>

Field	Information	YES	NO	NA
a)	Sampling dates noted?	$\boxtimes$		
b)	Does the laboratory narrative indicate deficiencies?	$\boxtimes$		

#### Comments:

VOC: Insufficient sample volume to perform MS/MSD associated with batches 506145, 506162, and 506378.

Samples BSA-MW-4D, BSA-MW-3D, BSA-MW-2D, CPA-MW-3D, CPA-MW-3D-AD, and CPA-MW-1D required dilution prior to analysis, reporting limits were adjusted accordingly.

Dissolved Gases: No deficiencies noted.

Metals: No deficiencies noted.

<u>Alkalinity:</u> Due to instrument failure, samples BSA-MW-3D, BSA-MW-2D, CPA-MW-3D, and CPA-MW-1D sent to an alternate lab and analyzed outside of hold time.

*Chloride:* Samples BSA-MW-4D, BSA-MW-3D, BSA-MW-2D, CPA-MW-3D, and CPA-MW-1D required dilution prior to analysis, reporting limits were adjusted accordingly.

Nitrate-Nitrite as Nitrogen: Due to instrument failure, samples BSA-MW-4D and BSA-MW-3D analyzed outside of hold time.

Sulfate: Samples BSA-MW-4D and CPA-MW-3D required dilution prior to analysis, reporting limits were adjusted accordingly.

TOC: No deficiencies noted.

DOC: No deficiencies noted.

Free Carbon Dioxide: No deficiencies noted.

#### Chain-of-Custody (COC)

- a) Was the COC signed by both field and laboratory personnel?
- b) Were samples received in good condition?

**Comments:** <u>Samples were received at 1.0°C and 3.5°C</u>, within the 0°C to 6°C criteria.



YES NO

 $\square$ 

 $\boxtimes$ 

 $\boxtimes$ 

NA

 $\square$ 

	February 2018	2	140-3345
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Gene	ral	YES	NO	NA
a)	Were hold times met for sample analysis?		$\boxtimes$	
b)	Were the correct preservatives used?	$\boxtimes$		
c)	Was the correct method used?		$\boxtimes$	
d)	Any sample dilutions noted?	$\boxtimes$		

**Comments:** <u>Due to instrument failure, samples were sent to an alternate lab and were analyzed under a different method for</u> <u>alkalinity (SM 2320B) and free carbon dioxide (SM 4500 CO2C).</u> The instrument failure and sample re-shipment resulted in alkalinity, <u>carbon dioxide</u>, and nitrate analyzed outside of hold time.

Detections in diluted analysis were qualified.

GC/N	IS Instrument Performance Check (IPC) and Internal Standards (IS)	YES	NO	NA
a)	IPC analyzed at the appropriate frequency and met the appropriate standards?	$\boxtimes$		
b)	Does BFB/DFTPP meet the ion abundance criteria?	$\boxtimes$		
c)	Internal Standard retention times and areas met appropriate criteria?	$\boxtimes$		
Co	mments: None.			
Calib	prations	YES	NO	NA
a)	Initial calibration analyzed at the appropriate frequency and met the appropriate standards?	$\boxtimes$		
b)	Continuing calibrations analyzed at the appropriate frequency and met the appropriate standards	?		
		$\boxtimes$		
c)	Initial calibration verifications and blanks analyzed at the appropriate frequency and met the appropriate	opriate	stand	ards?
			$\boxtimes$	
d)	Continuing calibration verifications and blanks analyzed at the appropriate frequency and met the	appro	oriate	standards?
	mments: Some compounds did not meet calibration requirements; however, calibration criteria we data qualification was required.	re met	⊠ by an	alytes of interest.
Blan	ks	YES	NO	NA
a)	Were blanks (trip, equipment, method) performed at required frequency?	$\boxtimes$		
b)	Were analytes detected in any blanks?	$\boxtimes$		
Co	mments: Equipment blank for BSA-MW-3D was submitted with SDG KPS200.			
	mments: <u>Chlorobenzene was detected in the EB. No qualification was required due to analytes ei</u> nple, or detected at concentrations significantly greater than the EB detections.	ther no	t dete	cted in associated
Matri	x Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA
a)	Was MS/MSD accuracy criteria met?	$\boxtimes$		
b)	Was MS/MSD precision criteria met?	$\boxtimes$		
Co	mments: None.			
Labo	ratory Control Sample (LCS)	YES	NO	NA
a)	LCS analyzed at the appropriate frequency and met appropriate standards?	$\boxtimes$		
Co	omments: None.			



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Surro	gate (System Monitoring) Compounds	YES	NO	NA
a)	Surrogate compounds analyzed at the appropriate frequency and met appropriate standards?	$\boxtimes$		
Con	ments: <u>None.</u>			
Dupli	Duplicates		NO	NA
a)	Were field duplicates collected?	$\bowtie$		
b)	Was field duplicate precision criteria met?	$\bowtie$		
Co	mments: Duplicate sample CPA-MW-3D-1217-AD was submitted with SDG KPS200.			

# Additional Comments: None.

## **Qualifications:**

Quality Control Issue	Compound(s)	Qualifier	Samples Affected
Compounds analyzed at a dilution	Benzene, Chlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Chloride, and Sulfate	D	BSA-MW-2D, BSA-MW-3D, BSA-MW-4D, CPA-MW-1D, CPA-MW-3D, CPA-MW-3D-AD
Analyzed outside of hold time	Alkalinity and Carbon Dioxide, Free	J	BSA-MW-2D, BSA-MW-3D, CPA-MW-1D, CPA-MW-3D
Analyzed outside of hold time; compound not detected	Nitrate	IJ	BSA-MW-3D, BSA-MW-4D



#### SDG KPS200

Sample Results from:

BSA-MW-4D BSA-MW-3D BSA-MW-3D-EB BSA-MW-2D CPA-MW-3D CPA-MW-3D-AD CPA-MW-1D



THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc. **TestAmerica Savannah** 5102 LaRoche Avenue Savannah, GA 31404 Tel: (912)354-7858

TestAmerica Job ID: 680-146443-1 TestAmerica Sample Delivery Group: KPS200 Client Project/Site: 4Q17 LTM GW Sampling - 1403345

For: Solutia Inc. 575 Maryville Centre Dr. Saint Louis, Missouri 63141

Attn: Mr. Jerry Rinaldi

Jerry Jamies

Authorized for release by: 12/28/2017 3:53:33 PM Jerry Lanier, Project Manager I (912)354-7858 e.3410 jerry.lanier@testamericainc.com

Designee for

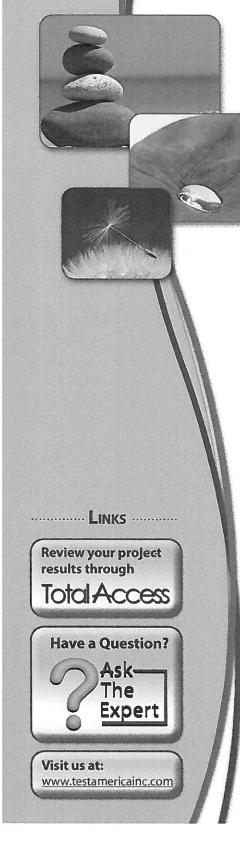
Michele Kersey, Project Manager II (912)354-7858 michele.kersey@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory. 3302 2/13/18





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33D 2/B/18 TestAmerica Savannah 12/28/2017

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

#### Job ID: 680-146443-1

#### Laboratory: TestAmerica Savannah

Narrative

# CASE NARRATIVE

# Client: Solutia Inc.

# Project: 4Q17 LTM GW Sampling - 1403345

# Report Number: 680-146443-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

#### RECEIPT

The samples were received on 12/07/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was1.0° C and 3.5° C.

#### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples BSA-MW-4D-1217 (680-146443-1), BSA-MW-3D-1217 (680-146443-3), BSA-MW-3D-1217-EB (680-146443-5), BSA-MW-2D-1217 (680-146443-6), CPA-MW-3D-1217 (680-146443-8), CPA-MW-3D-1217-AD (680-146443-10), CPA-MW-1D-1217 (680-146443-11), 4Q17 Trip Blank #3 (680-146443-13) and 4Q17 Trip Blank #4 (680-146443-14) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 12/13/2017 and 12/14/2017.

Samples BSA-MW-4D-1217 (680-146443-1)[20X], BSA-MW-3D-1217 (680-146443-3)[20X], BSA-MW-2D-1217 (680-146443-6)[100X], CPA-MW-3D-1217 (680-146443-8)[5X], CPA-MW-3D-1217-AD (680-146443-10)[5X] and CPA-MW-1D-1217 (680-146443-11)[250X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batches 680-506145, 680-506162, and 680-506378.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **DISSOLVED GASES**

Samples BSA-MW-4D-1217 (680-146443-1), BSA-MW-3D-1217 (680-146443-3), BSA-MW-2D-1217 (680-146443-6), CPA-MW-3D-1217 (680-146443-8) and CPA-MW-1D-1217 (680-146443-11) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 12/08/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### METALS (ICP) - DISSOLVED

Samples BSA-MW-4D-F(0.2)-1217 (680-146443-2), BSA-MW-3D-F(0.2)-1217 (680-146443-4), BSA-MW-2D-F(0.2)-1217 (680-146443-7), CPA-MW-3D-F(0.2)-1217 (680-146443-9) and CPA-MW-1D-F(0.2)-1217 (680-146443-12) were analyzed for Metals (ICP) - Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 12/11/2017 and analyzed on 12/13/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### METALS (ICP)

Samples BSA-MW-4D-1217 (680-146443-1), BSA-MW-3D-1217 (680-146443-3), BSA-MW-2D-1217 (680-146443-6), CPA-MW-3D-1217 (680-146443-8) and CPA-MW-1D-1217 (680-146443-11) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C.

TestAmerica Job ID: 680-146443-1

SDG: KPS200

## Job ID: 680-146443-1 (Continued)

#### Laboratory: TestAmerica Savannah (Continued)

The samples were prepared on 12/11/2017 and analyzed on 12/13/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **ALKALINITY**

Samples BSA-MW-3D-1217 (680-146443-3), BSA-MW-2D-1217 (680-146443-6), CPA-MW-3D-1217 (680-146443-8) and CPA-MW-1D-1217 (680-146443-11) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 12/26/2017.

Due to a significant instrument issue, the following samples were analyzed outside of hold time: BSA-MW-3D-1217 (680-146443-3), BSA-MW-2D-1217 (680-146443-6), CPA-MW-3D-1217 (680-146443-8) and CPA-MW-1D-1217 (680-146443-11). The samples were diverted to TA Cedar Falls for analysis to minimize the hold time exceedance.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### ALKALINITY

Sample BSA-MW-4D-1217 (680-146443-1) was analyzed for alkalinity in accordance with EPA Method 310.1. The samples were analyzed on 12/14/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### CHLORIDE

Samples BSA-MW-4D-1217 (680-146443-1), BSA-MW-3D-1217 (680-146443-3), BSA-MW-2D-1217 (680-146443-6), CPA-MW-3D-1217 (680-146443-8) and CPA-MW-1D-1217 (680-146443-11) were analyzed for Chloride in accordance with EPA Method 325.2. The samples were analyzed on 12/12/2017 and 12/13/2017.

Samples BSA-MW-4D-1217 (680-146443-1)[5X], BSA-MW-3D-1217 (680-146443-3)[10X], BSA-MW-2D-1217 (680-146443-6)[5X], CPA-MW-3D-1217 (680-146443-8)[2X] and CPA-MW-1D-1217 (680-146443-11)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### NITRATE-NITRITE AS NITROGEN

Samples BSA-MW-4D-1217 (680-146443-1), BSA-MW-3D-1217 (680-146443-3), BSA-MW-2D-1217 (680-146443-6), CPA-MW-3D-1217 (680-146443-8) and CPA-MW-1D-1217 (680-146443-11) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 12/08/2017.

The following samples was analyzed outside of analytical holding time due to an instrument failure: BSA-MW-4D-1217 (680-146443-1) and BSA-MW-3D-1217 (680-146443-3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **SULFATE**

Samples BSA-MW-4D-1217 (680-146443-1), BSA-MW-3D-1217 (680-146443-3), BSA-MW-2D-1217 (680-146443-6), CPA-MW-3D-1217 (680-146443-8) and CPA-MW-1D-1217 (680-146443-11) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 12/12/2017 and 12/13/2017.

Samples BSA-MW-4D-1217 (680-146443-1)[5X] and CPA-MW-3D-1217 (680-146443-8)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **TOTAL ORGANIC CARBON**

Samples BSA-MW-4D-1217 (680-146443-1), BSA-MW-3D-1217 (680-146443-3), BSA-MW-2D-1217 (680-146443-6), CPA-MW-3D-1217 (680-146443-8) and CPA-MW-1D-1217 (680-146443-11) were analyzed for total organic carbon in accordance with EPA Method 415.1.

4 5 7 8 9 10 11 12 13

## Job ID: 680-146443-1 (Continued)

#### Laboratory: TestAmerica Savannah (Continued)

The samples were analyzed on 12/14/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **DISSOLVED ORGANIC CARBON (DOC)**

Samples BSA-MW-4D-F(0.2)-1217 (680-146443-2), BSA-MW-3D-F(0.2)-1217 (680-146443-4), BSA-MW-2D-F(0.2)-1217 (680-146443-7), CPA-MW-3D-F(0.2)-1217 (680-146443-9) and CPA-MW-1D-F(0.2)-1217 (680-146443-12) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 12/13/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### FREE CARBON DIOXIDE

Samples BSA-MW-3D-1217 (680-146443-3), BSA-MW-2D-1217 (680-146443-6), CPA-MW-3D-1217 (680-146443-8) and CPA-MW-1D-1217 (680-146443-11) were analyzed for free carbon dioxide in accordance with SM 4500 CO2 C. The samples were analyzed on 12/26/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

## Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146443-1 SDG: KPS200

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-146443-1	BSA-MW-4D-1217	Water	12/06/17 08:45	12/07/17 09:15
680-146443-2	BSA-MW-4D-F(0.2)-1217	Water	12/06/17 08:45	12/07/17 09:15
680-146443-3	BSA-MW-3D-1217	Water	12/06/17 09:45	12/07/17 09:15
680-146443-4	BSA-MW-3D-F(0.2)-1217	Water	12/06/17 09:45	12/07/17 09:15
680-146443-5	BSA-MW-3D-1217-EB	Water	12/06/17 10:10	12/07/17 09:15
680-146443-6	BSA-MW-2D-1217	Water	12/06/17 10:40	12/07/17 09:15
680-146443-7	BSA-MW-2D-F(0.2)-1217	Water	12/06/17 10:40	12/07/17 09:15
680-146443-8	CPA-MW-3D-1217	Water	12/06/17 11:45	12/07/17 09:15
680-146443-9	CPA-MW-3D-F(0.2)-1217	Water	12/06/17 11:45	12/07/17 09:15
680-146443-10	CPA-MW-3D-1217-AD	Water	12/06/17 11:45	12/07/17 09:15
680-146443-11	CPA-MW-1D-1217	Water	12/06/17 14:00	12/07/17 09:15
680-146443-12	CPA-MW-1D-F(0.2)-1217	Water	12/06/17 14:00	12/07/17 09:15
680-146443-13	4Q17 Trip Blank #3	Water	12/06/17 00:00	12/07/17 09:15
680-146443-14	4Q17 Trip Blank #4	Water	12/06/17 00:00	12/07/17 09:15

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#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146443-1 SDG: KPS200

ethod	Method Description	Protocol	Laboratory
260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
SK-175	Dissolved Gases (GC)	RSK	TAL SAV
010C	Metals (ICP)	SW846	TAL SAV
0.1-1978	Alkalinity	MCAWW	TAL SAV
25.2-1978	Chloride	MCAVW	TAL SAV
3.2-1993 R2.0	Nitrogen, Nitrate-Nitrite	MCAVW	TAL SAV
5.4-1978	Sulfate	MCAVW	TAL SAV
5.1-1974	TOC	MCAVW	TAL SAV
5.1-1974	DOC	MCAVW	TAL SAV
A 2320B	Alkalinity	SM	TAL CF
4500 CO2 C	Free Carbon Dioxide	SM	TAL CF

#### **Protocol References:**

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

TestAmerica Savannah 12/28/2017

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

## Qualifiers

GC/MS VOA	
Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
GC VOA	
Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
Metals	
Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
General Cher	nistry
Qualifier	Qualifier Description
Н	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

# Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
8	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

TestAmerica Savannah 12/28/2017

TestAmerica Job ID: 680-146443-1 SDG: KPS200

Lab Sample ID: 680-146443-1

Lab Sample ID: 680-146443-2

Lab Sample ID: 680-146443-3

Lab Sample ID: 680-146443-4

#### Client Sample ID: BSA-MW-4D-1217

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	1800	P	20		ug/L	20	_	8260B	Total/NA
1,4-Dichlorobenzene	59	$\overline{\mathcal{V}}$	20		ug/L	20		8260B	Total/NA
Methane	120		0.58		ug/L	1		RSK-175	Total/NA
Iron	7.8		0.050		mg/L	1		6010C	Total
Manganese	0.54		0.010		mg/L	1		6010C	Recoverable Total Recoverable
Chloride	140	P	5.0		mg/L	5		325.2-1978	Total/NA
Sulfate	140	$\nabla$	25		mg/L	5		375.4-1978	Total/NA
Total Organic Carbon	4.3		1.0		mg/L	1		415.1-1974	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Alkalinity	550		5.0	1 das 10 land 1 and	mg/L	1	-	310.1-1978	Total/NA
Carbon Dioxide, Free	19		5.0		mg/L	1		310.1-1978	Total/NA

## Client Sample ID: BSA-MW-4D-F(0.2)-1217

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	7.7		0.050		mg/L	1	_	6010C	Dissolved
Manganese, Dissolved	0.53		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	4.4		1.0		mg/L	1		415.1-1974	Dissolved

#### Client Sample ID: BSA-MW-3D-1217

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	20	P	20		ug/L	20	_	8260B	Total/NA
Chlorobenzene	1400	$\square$	20		ug/L	20		8260B	Total/NA
1,4-Dichlorobenzene	250	$\overline{\mathcal{V}}$	20		ug/L	20		8260B	Total/NA
Methane (TCD)	630		390		ug/L	1		RSK-175	Total/NA
Iron	14		0.050		mg/L	1		6010C	Total
									Recoverable
Manganese	0.69		0.010		mg/L	1		6010C	Total
									Recoverable
Chloride	440	ア	10		mg/L	10		325.2-1978	Total/NA
Total Organic Carbon	4.0		1.0		mg/L	1		415.1-1974	Total/NA
Alkalinity as CaCO3	610	#5	5.0		mg/L	1		SM 2320B	Total/NA
Carbon Dioxide, Free	78	HF 3	5.0		mg/L	1		SM 4500 CO2 C	Total/NA

#### Client Sample ID: BSA-MW-3D-F(0.2)-1217

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	DI	Method	Prep Type
Iron, Dissolved	14		0.050		mg/L	1	— ē	6010C	Dissolved
Manganese, Dissolved	0.71		0.010		mg/L	1	(	6010C	Dissolved
Dissolved Organic Carbon	4.2		1.0		mg/L	1	4	415.1-1974	Dissolved
Client Sample ID: BSA-MW	/-3D-1217-EB					Lat	) Sa	ample ID: (	680-146443
Client Sample ID: BSA-MW		Qualifier	RL	MDL	Unit	Lab Dil Fac			680-146443 Prep Type
Client Sample ID: BSA-MW Analyte Chlorobenzene		Qualifier	<b>RL</b> 1.0	MDL	Unit ug/L	a are and are a constructed on the second and and	DI		

This Detection Summary does not include radiochemical test results.

Lab Sample ID: 680-146443-6

Lab Sample ID: 680-146443-7

Lab Sample ID: 680-146443-8

Lab Sample ID: 680-146443-9

Lab Sample ID: 680-146443-10

#### Client Sample ID: BSA-MW-2D-1217 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	16000	D	100		ug/L	100	_	8260B	Total/NA
Chlorobenzene	210	$\mathcal{P}$	100		ug/L	100		8260B	Total/NA
Ethane	5.2		1.1		ug/L	1		RSK-175	Total/NA
Methane (TCD)	17000		390		ug/L	1		RSK-175	Total/NA
Iron	8.2		0.050		mg/L	1		6010C	Total
									Recoverable
Manganese	0.94		0.010		mg/L	1		6010C	Total
		_							Recoverable
Chloride	200	$\mathcal{D}$	5.0		mg/L	5		325.2-1978	Total/NA
Nitrate as N	0.087		0.050		mg/L	1		353.2-1993 R2.0	Total/NA
Total Organic Carbon	9.4		1.0		mg/L	1		415.1-1974	Total/NA
Alkalinity as CaCO3	740	K3	5.0		mg/L	1		SM 2320B	Total/NA
Carbon Dioxide, Free	110	HF J	5.0		mg/L	1		SM 4500 CO2 C	Total/NA

## Client Sample ID: BSA-MW-2D-F(0.2)-1217

Analyte	Result	Qualifier RL	MDL Unit	Dil Fac	O Method	Ргер Туре
Iron, Dissolved	8.1	0.050	mg/L	1	6010C	Dissolved
Manganese, Dissolved	0.94	0,010	mg/L	1	6010C	Dissolved
Dissolved Organic Carbon	9.6	1.0	mg/L	1	415.1-1974	Dissolved

#### Client Sample ID: CPA-MW-3D-1217

#### Analyte **Result Qualifier** RL MDL Unit Dil Fac D Method Prep Type Benzene 6.8 5.0 5 8260B D ug/L Total/NA Þ Chlorobenzene 480 5.0 ug/L 5 8260B Total/NA 1,4-Dichlorobenzene 12 $\mathcal{D}$ 5.0 ug/L 5 8260B Total/NA Ethane 6.4 1.1 ug/L 1 **RSK-175** Total/NA Methane (TCD) 2500 390 **RSK-175** ug/L Total/NA 1 Iron 8.8 0.050 mg/L 6010C 1 Total Recoverable 0.53 Manganese 0.010 6010C mg/L 1 Total Recoverable Chloride 76 $\mathcal{D}$ 2.0 mg/L 2 325.2-1978 Total/NA D Sulfate 36 10 mg/L 2 375.4-1978 Total/NA Total Organic Carbon 6.1 1.0 Total/NA mg/L 1 415.1-1974 520 K > Alkalinity as CaCO3 5.0 mg/L 1 SM 2320B Total/NA 48 JHF 芕 Carbon Dioxide, Free 5.0 mg/L SM 4500 CO2 C Total/NA 1

#### Client Sample ID: CPA-MW-3D-F(0.2)-1217

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Iron, Dissolved	9.2	C	0.050		mg/L	1	_	6010C	Dissolved
Manganese, Dissolved	0.53	C	0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	6.4		1.0		mg/L	1		415.1-1974	Dissolved

#### Client Sample ID: CPA-MW-3D-1217-AD

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Benzene	6.6	P	5.0		ug/L	5	_	8260B	 Total/NA
Chiorobenzene	490	$\mathcal{P}$	5,0		ug/L	5		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

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TestAmerica Job ID: 680-146443-1 SDG: KPS200

## Client Sample ID: CPA-MW-3D-1217-AD (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dichlorobenzene	12	P	5.0		ug/L	5	_	8260B	Total/NA

#### Client Sample ID: CPA-MW-1D-1217

nalyte	Result	Qualifier	RL	MDL Un	nit	Dil Fac	D Me	ethod	Prep Type
enzene	3400	D	250	ug/	/L	250	82	60B	Total/NA
hlorobenzene	17000	P	250	ug/	/L	250	82	60B	Total/NA
,2-Dichlorobenzene	9600	$\mathcal{P}$	250	ug/	/L	250	82	60B	Total/NA
3-Dichlorobenzene	1100	$\mathcal{D}$	250	ug/	/L	250	82	60B	Total/NA
4-Dichlorobenzene	7800	$\mathcal{D}$	250	ug/	/L	250	82	60B	Total/NA
thane	13		1.1	ug	/L	1	RS	SK-175	Total/NA
lethane (TCD)	12000		390	ug	/L	1	R	SK-175	Total/NA
on	0.30		0.050	mg	g/L	1	60	10C	Total
									Recoverable
langanese	0.20		0.010	mg	g/L	1	60	10C	Total
		~							Recoverable
hloride	380	P	10	mg	g/L	10	32	5.2-1978	Total/NA
otal Organic Carbon	7.4		1.0	mg	g/L	1	41	5.1-1974	Total/NA
Ikalinity as CaCO3	790	#3	5.0	mg	g/L	1	SM	VI 2320B	Total/NA
arbon Dioxide, Free	22	HF J	5.0	mg	g/L	1	SM	4500 CO2 C	Total/NA
- 6 6 C					-				

#### Client Sample ID: CPA-MW-1D-F(0.2)-1217

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Iron, Dissolved	0.18	0.050	mg/L	1	6010C	Dissolved
Manganese, Dissolved	0.20	0.010	mg/L	1	6010C	Dissolved
Dissolved Organic Carbon	7.9	1.0	mg/L	1	415.1-1974	Dissolved

#### Client Sample ID: 4Q17 Trip Blank #3

No Detections.

#### Client Sample ID: 4Q17 Trip Blank #4

Lab Sample ID: 680-146443-12

Lab Sample ID: 680-146443-13

Lab Sample ID: 680-146443-14

No Detections.

This Detection Summary does not include radiochemical test results.

Lab Sample ID: 680-146443-10 4 5 6 7 8 9 10 11 12 13 14 Lab Sample ID: 680-146443-11

Date Received: 12/07/17 09:15

TestAmerica Job ID: 680-146443-1 SDG: KPS200

# Client Sample ID: BSA-MW-4D-1217 Date Collected: 12/06/17 08:45

# Lab Sample ID: 680-146443-1

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	20	U	20		ug/L			12/13/17 03:20	20
Chlorobenzene	1800	$\mathcal{P}$	20		ug/L			12/13/17 03:20	20
1,2-Dichlorobenzene	20	U	20		ug/L			12/13/17 03:20	20
1,3-Dichlorobenzene	20	U	20		ug/L			12/13/17 03:20	20
1,4-Dichlorobenzene	59	D	20		ug/L			12/13/17 03:20	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
Toluene-d8 (Surr)	94		80 - 120					12/13/17 03:20	20
1,2-Dichloroethane-d4 (Surr)	97		73 - 131					12/13/17 03:20	20
Dibromofluoromethane (Surr)	101		80 - 122					12/13/17 03:20	20
4-Bromofluorobenzene (Surr)	87		80 - 120					12/13/17 03:20	20
Method: RSK-175 - Dissolved	Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Ethane	1.1	U	1.1		ug/L			12/08/17 11:34	
Ethylene	1.0	U	1.0		ug/L			12/08/17 11:34	
Methane	120		0.58		ug/L			12/08/17 11:34	
Method: 6010C - Metals (ICP)	- Total Recoverat	ole							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Iron	7.8		0.050		mg/L		12/11/17 18:01	12/13/17 02:26	· · · ·
Manganese	0.54		0.010		mg/L		12/11/17 18:01	12/13/17 02:26	
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Chloride	140	D	5.0		mg/L			12/13/17 08:52	
Nitrate as N	0.050	UH J	0.050		mg/L			12/08/17 11:30	
Sulfate	140	$\triangleright$	25		mg/L			12/13/17 08:21	4
Total Organic Carbon	4.3		1.0		mg/L			12/14/17 10:01	
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fa
Alkalinity	550		5.0		mg/L			12/14/17 19:11	
Carbon Dioxide, Free	19		5.0		mg/L			12/14/17 19:11	

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146443-1 SDG: KPS200

Client Sample ID: BSA-MW-4 Date Collected: 12/06/17 08:45 Date Received: 12/07/17 09:15	D-F(0.2)-121	7					Lab Samp	le ID: 680-146 Matrix	6443-2 x: Water
Method: 6010C - Metals (ICP) - D		Qualifier	RL	MDL	Unit	D	Bronarod	Applyzod	Dil Fac
Analyte		Qualifier					Prepared	Analyzed	DII Fac
Iron, Dissolved	7.7		0.050		mg/L		12/11/17 18:01	12/13/17 03:23	1
Manganese, Dissolved	0.53		0.010		mg/L		12/11/17 18:01	12/13/17 03:23	1
 General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	4.4		1.0		mg/L			12/13/17 15:59	1

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345 TestAmerica Job ID: 680-146443-1 SDG: KPS200

# Client Sample ID: BSA-MW-3D-1217

Date Collected: 12/06/17 09:45 Date Received: 12/07/17 09:15

## Lab Sample ID: 680-146443-3 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Benzene	20	$\overline{\mathcal{D}}$	20		ug/L			12/13/17 03:42	20
Chlorobenzene	1400	Ď	20		ug/L			12/13/17 03:42	20
1,2-Dichlorobenzene	20	Ú	20		ug/L			12/13/17 03:42	20
1,3-Dichlorobenzene	20	U	20		ug/L			12/13/17 03:42	2
1,4-Dichlorobenzene	250	$\mathcal{P}$	20		ug/L			12/13/17 03:42	2
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
Toluene-d8 (Surr)	93		80 - 120					12/13/17 03:42	2
1,2-Dichloroethane-d4 (Surr)	100		73 - 131					12/13/17 03:42	2
Dibromofluoromethane (Surr)	102		80 - 122					12/13/17 03:42	2
4-Bromofluorobenzene (Surr)	90		80 - 120					12/13/17 03:42	2
Method: RSK-175 - Dissolved	Gases (GC)								
Analyte	· · ·	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Ethane	1,1	U	1.1		ug/L			12/08/17 11:46	
Ethylene	1.0	U	1.0		ug/L			12/08/17 11:46	
Methane (TCD)	630		390		ug/L			12/08/17 11:46	
Method: 6010C - Metals (ICP)	- Total Recoveral	ole							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Iron	14		0.050		mg/L		12/11/17 18:01	12/13/17 03:02	
							12/11/17 18:01	12/13/17 03:02	
Manganese	0.69		0,010		mg/L		12/11/11/10/01		
Manganese General Chemistry	0.69		0.010		mg/L				
General Chemistry		Qualifier	0.010 RL	MDL	-	D	Prepared	Analyzed	
General Chemistry Analyte		Qualifier		MDL	-	<u>D</u>			
General Chemistry Analyte Chloride	Result 440		RL	MDL	Unit	<u>D</u>		Analyzed	Dil Fa
General Chemistry Analyte Chloride Nitrate as N	Result 440	D	RL	MDL	Unit mg/L	<u>D</u>		Analyzed	
General Chemistry Analyte Chloride Nitrate as N Sulfate	Result 440 0.050	D	RL 10 0,050	MDL	Unit mg/L mg/L	<u>D</u>		Analyzed 12/13/17 08;52 12/08/17 11;31	
8	Result 440 0.050 5.0 4.0	D	RL 10 0.050 5.0	MDL	Unit mg/L mg/L mg/L	<u>D</u>		Analyzed 12/13/17 08:52 12/08/17 11:31 12/12/17 15:30	Dil Fa

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146443-1 SDG: KPS200

Client Sample ID: BSA-MW-3	BD-F(0.2)-121	7					Lab Samp	le ID: 680-14	6443-4
Date Collected: 12/06/17 09:45 Date Received: 12/07/17 09:15	6							Matrix	c: Water
 Method: 6010C - Metals (ICP) - D	issolved								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	14		0.050		mg/L		12/11/17 18:01	12/13/17 03:44	1
Manganese, Dissolved	0.71		0.010		mg/L		12/11/17 18:01	12/13/17 03:44	1
General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	4.2		1.0		mg/L			12/13/17 16:16	1

4 5 7 8 9 10 11 12 13 14

TestAmerica Job ID: 680-146443-1 SDG: KPS200

# Client Sample ID: BSA-MW-3D-1217-EB

#### Date Collected: 12/06/17 10:10 Date Received: 12/07/17 09:15

# Lab Sample ID: 680-146443-5

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/13/17 04:04	1
Chlorobenzene	2.5		1.0		ug/L			12/13/17 04:04	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 04:04	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 04:04	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 04:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	93		80 - 120			-		12/13/17 04:04	1
1,2-Dichloroethane-d4 (Surr)	93		73 - 131					12/13/17 04:04	1
Dibromofluoromethane (Surr)	99		80 - 122					12/13/17 04:04	1
4-Bromofluorobenzene (Surr)	90		80 - 120					12/13/17 04:04	1

TestAmerica Savannah 12/28/2017

TestAmerica Job ID: 680-146443-1 SDG: KPS200

# Client Sample ID: BSA-MW-2D-1217

Date Collected: 12/06/17 10:40 Date Received: 12/07/17 09:15

## Lab Sample ID: 680-146443-6 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	16000	$\overline{D}$	100		ug/L			12/14/17 20:08	100
Chlorobenzene	210	Ď	100		ug/L			12/14/17 20:08	100
1,2-Dichlorobenzene	100	Ű	100		ug/L			12/14/17 20:08	100
1,3-Dichlorobenzene	100	U	100		ug/L			12/14/17 20:08	100
1,4-Dichlorobenzene	100	U	100		ug/L			12/14/17 20:08	100
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		80 - 120					12/14/17 20:08	100
1,2-Dichloroethane-d4 (Surr)	92		73 _ 131					12/14/17 20:08	100
Dibromofluoromethane (Surr)	107		80 - 122					12/14/17 20:08	100
4-Bromofluorobenzene (Surr)	88		80 - 120					12/14/17 20:08	100
Method: RSK-175 - Dissolved	Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	5.2		1.1		ug/L			12/08/17 11:59	1
Ethylene	1.0	U	1.0		ug/L			12/08/17 11:59	1
Methane (TCD)	17000		390		ug/L			12/08/17 11:59	1
Method: 6010C - Metals (ICP)	- Total Recoverat	ole							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	8.2		0.050		mg/L		12/11/17 18:01	12/13/17 03:07	1
Manganese	0.94		0.010		mg/L		12/11/17 18:01	12/13/17 03:07	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	200	D	5.0		mg/L			12/12/17 15:45	5
Nitrate as N	0.087		0.050		mg/L			12/08/17 11:35	1
Sulfate	5.0	U	5.0		mg/L			12/12/17 15:30	1
Total Organic Carbon	9.4		1.0		mg/L			12/14/17 11:02	
	740	#5	5.0		mg/L			12/26/17 19:08	1
Alkalinity as CaCO3	740		5.0		mg/L			12/20/17 19.00	

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146443-1 SDG: KPS200

Client Sample ID: BSA-MW-2 Date Collected: 12/06/17 10:40 Date Received: 12/07/17 09:15	:D-F(0.2)-121	7					Lab Samp	le ID: 680-146 Matrix	6443-7 x: Water
	vissolved								
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	8.1		0.050		mg/L		12/11/17 18:01	12/13/17 03:39	1
Manganese, Dissolved	0.94		0.010		mg/L		12/11/17 18:01	12/13/17 03:39	1
 General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	9.6		1.0		mg/L			12/13/17 16:36	1

TestAmerica Savannah シラア ノバメバタ 12/28/2017

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345 TestAmerica Job ID: 680-146443-1 SDG: KPS200

#### Client Sample ID: CPA-MW-3D-1217 Date Collected: 12/06/17 11:45 Date Received: 12/07/17 09:15

#### Lab Sample ID: 680-146443-8 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	6.8	D	5.0		ug/L			12/13/17 16:48	5
Chlorobenzene	480	D	5.0		ug/L			12/13/17 16:48	5
1,2-Dichlorobenzene	5.0	U	5.0		ug/L			12/13/17 16:48	5
1,3-Dichlorobenzene	5.0	U	5.0		ug/L			12/13/17 16:48	5
1,4-Dichlorobenzene	12	$\mathcal{D}$	5.0		ug/L			12/13/17 16:48	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	95		80 - 120					12/13/17 16:48	5
1,2-Dichloroethane-d4 (Surr)	96		73 _ 131					12/13/17 16:48	5
Dibromofluoromethane (Surr)	102		80 - 122					12/13/17 16:48	5
4-Bromofluorobenzene (Surr)	88		80 - 120					12/13/17 16:48	5
Method: RSK-175 - Dissolved	Gases (GC)								
Analyte	· · /	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	6.4		1.1		ug/L			12/08/17 12:12	1
Ethylene	1.0	U	1.0		ug/L			12/08/17 12:12	1
Methane (TCD)	2500		390		ug/L			12/08/17 12:12	1
Method: 6010C - Metals (ICP)	- Total Recoverat	ole							
		Qualifier			Unit	D	Prepared	Analyzed	Dil Fac
Analyte	Result	Quaimer	RL	MDL					
	8.8 Kesuit		0,050	MDL	mg/L		12/11/17 18:01	12/13/17 03:13	1
Analyte Iron Manganese		Quainer					12/11/17 18:01 12/11/17 18:01	12/13/17 03:13 12/13/17 03:13	
Iron	8.8	Quaimer	0.050	MDL	mg/L				1
Iron Manganese General Chemistry	8.8	Qualifier	0.050		mg/L	 D			1
Iron Manganese	8.8		0.050 0.010		mg/L mg/L	D	12/11/17 18:01	12/13/17 03:13	1
Iron Manganese General Chemistry Analyte Chloride	8.8 0.53 Result	Qualifier	0.050 0.010 RL		mg/L mg/L Unit	D	12/11/17 18:01	12/13/17 03:13 Analyzed	1 1 Dil Fac
Iron Manganese General Chemistry Analyte Chloride Nitrate as N	8.8 0.53 	Qualifier	0.050 0.010 <u>RL</u> 2.0		mg/L mg/L Unit mg/L	D	12/11/17 18:01	12/13/17 03:13 Analyzed 12/12/17 15:45	Dil Fac
Iron Manganese General Chemistry Analyte Chloride Nitrate as N Sulfate	8.8 0.53 Result 76 0.050	Qualifier	0,050 0.010 <u>RL</u> 2.0 0.050		mg/L mg/L Unit mg/L mg/L	D	12/11/17 18:01	12/13/17 03:13 Analyzed 12/12/17 15:45 12/08/17 11:36	1 1 Dil Fac 2 1 2
Iron Manganese General Chemistry Analyte	8.8 0.53 Result 76 0.050 36 6.1	Qualifier	0.050 0.010 <b>RL</b> 2.0 0.050 10		mg/L mg/L Unit mg/L mg/L mg/L	D	12/11/17 18:01	Analyzed 12/12/17 15:45 12/08/17 11:36 12/13/17 08:30	1 1 Dil Fac

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146443-1 SDG: KPS200

Client Sample ID: CPA-MW-3D	)-F(0.2)-121	7	lient Sample ID: CPA-MW-3D-F(0.2)-1217							
Date Collected: 12/06/17 11:45								Matrix	x: Water	
Date Received: 12/07/17 09:15					An and and a sum of a 110,000,000,000					
 Method: 6010C - Metals (ICP) - Dis	solved									
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron, Dissolved	9.2		0.050		mg/L		12/11/17 18:01	12/13/17 03:33	1	
Manganese, Dissolved	0.53		0.010		mg/L		12/11/17 18:01	12/13/17 03:33	1	
 General Chemistry - Dissolved										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Dissolved Organic Carbon	6.4		1.0		mg/L			12/13/17 16:53	1	

TestAmerica Job ID: 680-146443-1 SDG: KPS200

#### Client Sample ID: CPA-MW-3D-1217-AD Date Collected: 12/06/17 11:45 Date Received: 12/07/17 09:15

# Lab Sample ID: 680-146443-10

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	6.6	D	5.0		ug/L			12/13/17 17:10	5
Chlorobenzene	490	D	5.0		ug/L			12/13/17 17:10	5
1,2-Dichlorobenzene	5.0	U	5.0		ug/L			12/13/17 17:10	5
1,3-Dichlorobenzene	5.0	U	5.0		ug/L			12/13/17 17:10	5
1,4-Dichlorobenzene	12	P	5.0		ug/L			12/13/17 17:10	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	95		80 - 120			-		12/13/17 17:10	5
1,2-Dichloroethane-d4 (Surr)	96		73 - 131					12/13/17 17:10	5
Dibromofluoromethane (Surr)	101		80 - 122					12/13/17 17:10	5
4-Bromofluorobenzene (Surr)	89		80 - 120					12/13/17 17:10	5





Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345 TestAmerica Job ID: 680-146443-1 SDG: KPS200

# Client Sample ID: CPA-MW-1D-1217

Date Collected: 12/06/17 14:00 Date Received: 12/07/17 09:15

# Lab Sample ID: 680-146443-11

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Benzene	3400	7	250		ug/L			12/13/17 17:31	25
Chlorobenzene	17000	D	250		ug/L			12/13/17 17:31	25
1,2-Dichlorobenzene	9600	び	250		ug/L			12/13/17 17:31	25
1,3-Dichlorobenzene	1100	Ď	250		ug/L			12/13/17 17:31	25
1,4-Dichlorobenzene	7800	$\nabla$	250		ug/L			12/13/17 17:31	25
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
Toluene-d8 (Surr)	95		80 - 120					12/13/17 17:31	25
1,2-Dichloroethane-d4 (Surr)	98		73 - 131					12/13/17 17:31	25
Dibromofluoromethane (Surr)	105		80 - 122					12/13/17 17:31	25
4-Bromofluorobenzene (Surr)	90		80 - 120					12/13/17 17:31	25
Method: RSK-175 - Dissolved	Gases (GC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Ethane	13		1.1		ug/L			12/08/17 12:25	
Ethylene	1.0	U	1.0		ug/L			12/08/17 12:25	
Methane (TCD)	12000		390		ug/L			12/08/17 12:25	
Method: 6010C - Metals (ICP) -	Total Recoverat	ole							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Iron	0.30		0.050		mg/L		12/11/17 18:01	12/13/17 03:18	
Manganese	0.20		0,010		mg/L		12/11/17 18:01	12/13/17 03:18	
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Chloride	380	P	10		mg/L			12/13/17 08:52	
Nitrate as N	0.050	U	0.050		mg/L			12/08/17 11:37	
Sulfate	5.0	U	5.0		mg/L			12/13/17 08:18	
Total Organic Carbon	7.4	_	1.0		mg/L			12/14/17 12:06	
Alkalinity as CaCO3	790	#5	5.0		mg/L			12/26/17 19:08	
Carbon Dioxide, Free	22	HES	5.0		mg/L			12/26/17 10:59	

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146443-1 SDG: KPS200

Client Sample ID: CPA-MW-1D-F(0.2)-1217         Lab Sample ID: 680-146443           Date Collected: 12/06/17 14:00         Matrix: Wa           Date Received: 12/07/17 09:15									
– Method: 6010C - Metals (ICP) - Dis Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	·	Quaimer .							DIFAG
Iron, Dissolved	0.18		0.050		mg/L		12/11/17 18:01	12/13/17 03:28	1
Manganese, Dissolved	0.20		0.010		mg/L		12/11/17 18:01	12/13/17 03:28	1
 General Chemistry - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	7.9		1.0		mg/L	<u> </u>		12/13/17 17:10	1

TestAmerica Job ID: 680-146443-1 SDG: KPS200

#### Client Sample ID: 4Q17 Trip Blank #3 Date Collected: 12/06/17 00:00

Date Received: 12/07/17 09:15

# Lab Sample ID: 680-146443-13

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/13/17 14:38	1
Chlorobenzene	1.0	U	1.0		ug/L			12/13/17 14:38	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 14:38	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 14:38	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 14:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	93		80 - 120			-		12/13/17 14:38	1
1,2-Dichloroethane-d4 (Surr)	93		73 _ 131					12/13/17 14:38	1
Dibromofluoromethane (Surr)	100		80 _ 122					12/13/17 14:38	1
4-Bromofluorobenzene (Surr)	91		80 - 120					12/13/17 14:38	1

5 6 7 8 9 11 12 13

TestAmerica Job ID: 680-146443-1 SDG: KPS200

## Client Sample ID: 4Q17 Trip Blank #4

Date Collected: 12/06/17 00:00 Date Received: 12/07/17 09:15

# Lab Sample ID: 680-146443-14

Matrix: Water

#### Method: 8260B - Volatile Organic Compounds (GC/MS) Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed Dil Fac Benzene 1.0 U 1.0 12/13/17 14:59 ug/L 1 Chlorobenzene 1.0 U ug/L 12/13/17 14:59 1.0 1 1,2-Dichlorobenzene 1.0 U 1.0 ug/L 12/13/17 14:59 1 1.0 U ug/L 12/13/17 14:59 1,3-Dichlorobenzene 1.0 1 1.0 U 12/13/17 14:59 1,4-Dichlorobenzene 1.0 ug/L 1 Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac 95 80 - 120 Toluene-d8 (Surr) 12/13/17 14:59 1 1,2-Dichloroethane-d4 (Surr) 95 73 - 131 12/13/17 14:59 1 Dibromofluoromethane (Surr) 100 80 - 122 12/13/17 14:59 1 4-Bromofluorobenzene (Surr) 92 80 - 120 12/13/17 14:59 1



# Method: 8260B - Volatile Organic Compounds (GC/MS)

Prep Type: Total/NA

				Percent Su	rogate Recovery (A	Acceptance Limits)
		TOL	DCA	DBFM	BFB	
Lab Sample ID	Client Sample ID	(80-120)	(73-131)	(80-122)	(80-120)	
680-146443-1	BSA-MW-4D-1217	94	97	101	87	
680-146443-3	BSA-MW-3D-1217	93	100	102	90	
680-146443-5	BSA-MW-3D-1217-EB	93	93	99	90	
680-146443-6	BSA-MW-2D-1217	98	92	107	88	
680-146443-8	CPA-MW-3D-1217	95	96	102	88	
680-146443-10	CPA-MW-3D-1217-AD	95	96	101	89	
680-146443-11	CPA-MW-1D-1217	95	98	105	90	
680-146443-13	4Q17 Trip Blank #3	93	93	100	91	
680-146443-14	4Q17 Trip Blank #4	95	95	100	92	
LCS 680-506145/3	Lab Control Sample	95	90	95	91	
LCS 680-506162/4	Lab Control Sample	96	92	97	94	
LCS 680-506378/4	Lab Control Sample	94	90	96	87	
LCSD 680-506145/4	Lab Control Sample Dup	96	91	97	93	
LCSD 680-506162/5	Lab Control Sample Dup	88	85	88	86	
LCSD 680-506378/5	Lab Control Sample Dup	98	94	99	93	
MB 680-506145/9	Method Blank	95	94	99	92	
MB 680-506162/9	Method Blank	94	93	99	87	
MB 680-506378/8	Method Blank	94	94	99	89	

#### Surrogate Legend

TOL = Toluene-d8 (Surr)

DCA = 1,2-Dichloroethane-d4 (Surr)

DBFM = Dibromofluoromethane (Surr)

BFB = 4-Bromofluorobenzene (Surr)

#### Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-506145/9 Matrix: Water							Client Sa	ample ID: Metho Prep Type: 1	
Analysis Batch: 506145									
-	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/12/17 20:50	1
Chlorobenzene	1.0	U	1.0		ug/L			12/12/17 20:50	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/12/17 20:50	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/12/17 20:50	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/12/17 20:50	1
	МВ	MB							
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac

Toluene-d8 (Surr)	95	80 - 120	 12/12/17 20:50	1
1,2-Dichloroethane-d4 (Surr)	94	73 - 131	12/12/17 20:50	1
Dibromofluoromethane (Surr)	99	80 - 122	12/12/17 20:50	1
4-Bromofluorobenzene (Surr)	92	80 - 120	12/12/17 20:50	1
salar -				

#### Lab Sample ID: LCS 680-506145/3 Matrix: Water Analysis Batch: 506145

-	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Benzene	50.0	46.5		ug/L		93	80 - 120
Chlorobenzene	50.0	49.2		ug/L		98	80 - 120
1,2-Dichlorobenzene	50.0	48.3		ug/L		97	80 - 120
1,3-Dichlorobenzene	50.0	47.4		ug/L		95	80 - 120
1,4-Dichlorobenzene	50.0	48.1		ug/L		96	80 - 120

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	95		80 - 120
1,2-Dichloroethane-d4 (Surr)	90		73 _ 131
Dibromofluoromethane (Surr)	95		80 - 122
4-Bromofluorobenzene (Surr)	91		80 - 120

#### Lab Sample ID: LCSD 680-506145/4 Matrix: Water

#### Analysis Batch: 506145

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	50.0	47.7		ug/L		95	80 - 120	3	20
Chlorobenzene	50.0	50.5		ug/L		101	80 - 120	3	20
1,2-Dichlorobenzene	50.0	48.9		ug/L		98	80 - 120	1	20
1,3-Dichlorobenzene	50.0	48.3		ug/L		97	80 - 120	2	20
1,4-Dichlorobenzene	50.0	49.2		ug/L		98	80 - 120	2	20

	LCSD LC	SD	
Surrogate	%Recovery Qu	alifier	Limits
Toluene-d8 (Surr)	96		80 - 120
1,2-Dichloroethane-d4 (Surr)	91		73 - 131
Dibromofluoromethane (Surr)	97		80 - 122
4-Bromofluorobenzene (Surr)	93		80 - 120

## Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

#### TestAmerica Savannah SDD J/13/18 12/28/2017

#### Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-506162/9 Matrix: Water Analysis Batch: 506162							Client Sa	ample ID: Metho Prep Type: T	
-	MB	МВ							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/13/17 10:35	1
Chlorobenzene	1.0	U	1.0		ug/L			12/13/17 10:35	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 10:35	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 10:35	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 10:35	1
	MB	MB							

	mb	mb			
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed
Toluene-d8 (Surr)	94		80 - 120		12/13/17 10:35
1,2-Dichloroethane-d4 (Surr)	93		73 - 131		12/13/17 10:35
Dibromofluoromethane (Surr)	99		80 - 122		12/13/17 10:35
4-Bromofluorobenzene (Surr)	87		80 - 120		12/13/17 10:35

#### Lab Sample ID: LCS 680-506162/4 Matrix: Water Analysis Batch: 506162

-	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Benzene	50.0	48.6		ug/L		97	80 - 120
Chlorobenzene	50.0	50.6		ug/L		101	80 - 120
1,2-Dichlorobenzene	50.0	50.6		ug/L		101	80 - 120
1,3-Dichlorobenzene	50.0	49.0		ug/L		98	80 _ 120
1,4-Dichlorobenzene	50.0	50.6		ug/L		101	80 - 120

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	96		80 - 120
1,2-Dichloroethane-d4 (Surr)	92		73 _ 131
Dibromofluoromethane (Surr)	97		80 - 122
4-Bromofluorobenzene (Surr)	94		80 - 120

#### Lab Sample ID: LCSD 680-506162/5 Matrix: Water

#### Analysis Batch: 506162

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	50.0	44.6		ug/L		89	80 - 120	9	20
Chlorobenzene	50.0	46.6		ug/L		93	80 - 120	8	20
1,2-Dichlorobenzene	50.0	46.4		ug/L		93	80 - 120	9	20
1,3-Dichlorobenzene	50.0	44.8		ug/L		90	80 - 120	9	20
1,4-Dichlorobenzene	50.0	46.1		ug/L		92	80 - 120	9	20

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	88		80 - 120
1,2-Dichloroethane-d4 (Surr)	85		73 - 131
Dibromofluoromethane (Surr)	88		80 - 122
4-Bromofluorobenzene (Surr)	86		80 - 120

4 5 6

# Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

#### Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-506378/8 Matrix: Water Analysis Batch: 506378	мв	МВ					Client Sa	mple ID: Metho Prep Type: T	
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/14/17 12:32	1
Chlorobenzene	1.0	U	1.0		ug/L			12/14/17 12:32	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/14/17 12:32	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/14/17 12:32	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/14/17 12:32	1

	MB	MB		
Surrogate	%Recovery	Qualifier Limits	Prepared Analyzed	Dil Fac
Toluene-d8 (Surr)	94	80 - 120	12/14/17 12:32	1
1,2-Dichloroethane-d4 (Surr)	94	73 - 131	12/14/17 12:32	1
Dibromofluoromethane (Surr)	99	80 - 122	12/14/17 12:32	1
4-Bromofluorobenzene (Surr)	89	80 - 120	12/14/17 12:32	1

#### Lab Sample ID: LCS 680-506378/4 Matrix: Water

#### Analysis Batch: 506378

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Benzene	50.0	46.1		ug/L		92	80 - 120	
Chlorobenzene	50.0	48.5		ug/L		97	80 - 120	
1,2-Dichlorobenzene	50.0	46.7		ug/L		93	80 - 120	
1,3-Dichlorobenzene	50.0	45.9		ug/L		92	80 - 120	
1,4-Dichlorobenzene	50.0	46.4		ug/L		93	80 - 120	

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	94		80 - 120
1,2-Dichloroethane-d4 (Surr)	90		73 - 131
Dibromofluoromethane (Surr)	96		80 - 122
4-Bromofluorobenzene (Surr)	87		80 - 120

#### Lab Sample ID: LCSD 680-506378/5 Matrix: Water

#### Analysis Batch: 506378

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	50.0	47.7		ug/L		95	80 - 120	3	20
Chlorobenzene	50.0	52.1		ug/L		104	80 - 120	7	20
1,2-Dichlorobenzene	50.0	50.1		ug/L		100	80 - 120	7	20
1,3-Dichlorobenzene	50.0	49.2		ug/L		98	80 - 120	7	20
1,4-Dichlorobenzene	50.0	49.6		ug/L		99	80 - 120	7	20

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	98	16	80 _ 120
1,2-Dichloroethane-d4 (Surr)	94		73 - 131
Dibromofluoromethane (Surr)	99		80 - 122
4-Bromofluorobenzene (Surr)	93		80 - 120

Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

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Lab Sample ID: MB 680-505591/10									Client	Sample ID: I	lethod	Blank
Matrix: Water										Prep T	/pe: To	tal/NA
Analysis Batch: 505591												
	MB	MB										
Analyte	Result	Qualifier		RL		MDL Uni	t	D	Prepared	Analyz	ed	Dil Fac
Ethane	1.1	U		1.1		ug/l	-			12/08/17	1:09	1
Ethylene	1.0	U		1.0		ug/l	-			12/08/17	1:09	1
Methane	0.58	U		0.58		ug/l	-			12/08/17	1:09	1
Methane (TCD)	390	U		390		ug/l	-			12/08/17	1:09	1
Lab Sample ID: LCS 680-505591/3								Clie	nt Samp	e ID: Lab Co	ontrol S	ample
Matrix: Water										Prep T	ype: To	tal/NA
Analysis Batch: 505591												
			Spike		LCS	LCS				%Rec.		
Analyte			Added		Result	Qualifier	Unit	D	%Rec	Limits		
Ethane			288		272		ug/L		94	75 - 125		
Ethylene			269		255		ug/L		95	75 - 125		
Lab Sample ID: LCS 680-505591/7								Clie	nt Samp	le ID: Lab Co	ontrol S	ample
Matrix: Water										Prep T	ype: To	tal/NA
Analysis Batch: 505591												
			Spike		LCS	LCS				%Rec.		
Analyte			Added		Result	Qualifier	Unit	0	%Rec	Limits		
Methane (TCD)			1920		1840		ug/L		96	75 - 125		
Lab Sample ID: LCSD 680-505591/4							C	lient Sa	mple ID:	Lab Contro	l Sampl	le Dup
Matrix: Water										Prep T	ype: To	tal/NA
Analysis Batch: 505591												
			Spike		LCSD	LCSD				%Rec.		RPD
Analyte			Added		Result	Qualifier	Unit	0	%Rec	Limits	RPD	Limi
Ethane			288		236		ug/L		82	75 - 125	14	30
Ethylene			269		223		ug/L		83	75 - 125	13	30
Lab Sample ID: LCSD 680-505591/8							c	lient Sa	mple ID	Lab Contro	I Sampl	le Dup
Matrix: Water										Prep T	ype: To	tal/NA
Analysis Batch: 505591										-		
			Spike		LCSD	LCSD				%Rec.		RPI
Analyte			Added		Result	Qualifier	Unit		%Rec	Limits	RPD	Limi
Methane (TCD)			1920		1730		ug/L		90	75 - 125	6	30

# Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-505987/1-A Matrix: Water Analysis Batch: 506233	МВ	МВ						mple ID: Metho ype: Total Reco Prep Batch:	verable
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.050	U	0.050		mg/L		12/11/17 18:01	12/13/17 02:15	1
Iron, Dissolved	0.050	U	0.050		mg/L		12/11/17 18:01	12/13/17 02:15	1
Manganese	0.010	U	0.010		mg/L		12/11/17 18:01	12/13/17 02:15	1
Manganese, Dissolved	0.010	U	0.010		mg/L		12/11/17 18:01	12/13/17 02:15	1

Client Sample ID: BSA-MW-4D-1217

#### Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 680-505987/2-A Matrix: Water Analysis Batch: 506233	Spike	LCS	LCS		Client		e ID: Lab Control Sample Type: Total Recoverable Prep Batch: 505987 %Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Iron	5.00	5.14		mg/L		103	80 - 120
Iron, Dissolved	5.00	5.14		mg/L		103	80 - 120
Manganese	0.500	0.536		mg/L		107	80 - 120
Manganese, Dissolved	0.500	0.536		mg/L		107	80 - 120

#### Lab Sample ID: 680-146443-1 MS Matrix: Water

Matrix: Water								Prep		I Recoverable
Analysis Batch: 506233	Sample	Sample	Spike	MS	MS				Prep I %Rec.	Batch: 505987
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Iron	7.8		5.00	12.7		mg/L		98	75 - 125	
Iron, Dissolved	7.8		5.00	12.7		mg/L		98	75 <sub>-</sub> 125	
Manganese	0.54		0.500	1.06		mg/L		104	75 - 125	
Manganese, Dissolved	0.54		0.500	1.06		mg/L		104	75 - 125	

Lab Sample ID: 680-146443-1 MSD Matrix: Water Analysis Batch: 506233							Clie		ple ID: BSA Type: Tota Prep I		rable
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Iron	7.8		5.00	13.0		mg/L		104	75 - 125	2	20
Iron, Dissolved	7.8		5.00	13.0		mg/L		104	75 _ 125	2	20
Manganese	0.54		0.500	1.08		mg/L		108	75 - 125	2	20
Manganese, Dissolved	0.54		0.500	1.08		mg/L		108	75 _ 125	2	20

#### Method: 310.1-1978 - Alkalinity

Lab Sample ID: MB 680-507269/1 Matrix: Water										CI	ient S	ample ID: Me Prep Typ		
Analysis Batch: 507269														
-	MB	MB												
Analyte	Result	Qualifier		RL		RL	Unit		D	Prep	ared	Analyzed		Dil Fac
Alkalinity	5.0	U		5.0			mg/L					12/14/17 18:	28	1
Carbon Dioxide, Free	5.0	U		5.0			mg/∟					12/14/17 18:	28	1
Lab Sample ID: LCS 680-507269/5									Clie	nt Sa	ample	ID: Lab Cont	rol S	ample
Matrix: Water											•	Prep Typ	e: To	tal/NA
Analysis Batch: 507269														
-			Spike		LCS	LCS						%Rec.		
Analyte			Added		Result	Quali	fier	Unit	0	) %	6Rec	Limits		
Alkalinity			250		262			mg/L			105	80 - 120		
Lab Sample ID: LCSD 680-507269/13								С	lient Sa	mpl	e ID: L	ab Control S	ampl	le Dup
Matrix: Water												Prep Typ	e: To	tal/NA
Analysis Batch: 507269														
			Spike		LCSD	LCSE	)					%Rec.		RPD
Analyte			Added		Result	Quali	fier	Unit		> %	6Rec	Limits	RPD	Limit
Alkalinity			250		253		_	mg/L			101	80 - 120	4	30

TestAmerica Savannah ション ノイヨハ 8 12/28/2017 Method: 325.2-1978 - Chloride

											CARL CONTRACTOR OF THE OWNER OF THE OWNER OF THE		
_ab Sample ID: MB 680-506187/13										Client S	ample ID: I	Method	Blan
Matrix: Water											Prep T	уре: То	tal/N/
Analysis Batch: 506187													
-	MB	MB											
nalyte	Result	Qualifier		RL	I	MDL Unit		D	Pr	epared	Analyz	ed	Dil Fa
Chloride	1.0	U		1.0		mg/L					12/12/17	14:25	
ab Sample ID: LCS 680-506187/14								CI	iont	Samnio	ID: Lab Co	ontrol S	amn'
Aatrix: Water								0		oumpie		ype: To	
											riep i	ype. 10	
Analysis Batch: 506187			Spike		LCS	105					%Rec.		
nalida			Added			Qualifier	Unit		D	%Rec	Limits		
Analyte			25.0		26.4	Quanner	mg/L		_	106	85 - 115		
Chloride			25.0		20.4		mg/L			100	00-110		
ab Sample ID: LCSD 680-506187/18							С	lient \$	Sam	ple ID: I	Lab Contro		
Matrix: Water											Prep T	уре: То	tal/N
Analysis Batch: 506187													
-			Spike		LCSD	LCSD					%Rec.		R
Analyte			Added		Result	Qualifier	Unit		D	%Rec	Limits	RPD	Lir
Chloride			25.0		27.0		mg/L		_	108	85 - 115	2	
ethod: 353.2-1993 R2.0 - Nitroge	en, Nitra	ate-Nitri	te										
ab Sample ID: MB 680-505672/13										Client S	ample ID:	Method	Bla
latrix: Water											•	ype: To	
												1	
Analysis Batch: 505672													
Analysis Batch: 505672	МВ	MB											
-				RL		MDL Unit		D	P	repared	Analyz	zed	Dil I
Analyte		MB Qualifier U		<b>RL</b> 0.050		MDL Unit			P	repared	Analy2 12/08/17		Dil F
Analyte	Result	Qualifier						<u>D</u>	P	repared			Dil I
Analyte Nitrate as N	Result	Qualifier								-		11:20	
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16	Result	Qualifier								-	12/08/17	11:20	Samp
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water	Result	Qualifier								-	12/08/17	11:20	Samp
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water	Result	Qualifier	Spike							-	12/08/17	11:20	Samp
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672	Result	Qualifier	Spike		LCS	mg/l					12/08/17 e ID: Lab C Prep T	11:20	Samp
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte	Result	Qualifier	•		LCS	mg/l	Unit		lient	Sample	12/08/17 Prep T %Rec.	11:20	Samp
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Nitrate as N	Result	Qualifier	<b>Added</b> 0.500		LCS Result 0.514	mg/l	- Unit mg/L		lient	Sample %Rec 103	12/08/17 a ID: Lab C Prep T %Rec. Limits 75 - 125	11:20	Samp
Analyte Vitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Vitrate as N Vitrate Nitrite as N	Result	Qualifier	Added		LCS Result	mg/l	Unit		lient	Sample %Rec	12/08/17 e ID: Lab C Prep T %Rec. Limits	11:20	Samp
Analyte Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Vitrate as N Vitrate Nitrite as N	Result	Qualifier	Added 0.500 1.00		LCS Result 0.514 1.01	mg/l	- Unit mg/L mg/L		lient	<b>Sample</b> %Rec 103 101	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110	11:20	Samp
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Nitrate as N Nitrate Nitrite as N	Result	Qualifier	Added 0.500 1.00		LCS Result 0.514 1.01	mg/l	- Unit mg/L mg/L		lient	<b>Sample</b> %Rec 103 101	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110	11:20	Samj
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Nitrate as N Nitrate Nitrite as N Nitrite as N Nitrite As N Nitrite As N	Result	Qualifier	Added 0.500 1.00		LCS Result 0.514 1.01	mg/l	- Unit mg/L mg/L		lient	<b>%Rec</b> 103 101 99	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110 90 - 110 Sample ID:	11:20 ontrol S ype: To 	Samı otal/l
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Nitrate as N Nitrate Nitrite as N Nitrite as N Nitrite as N Nitrite as N Lab Sample ID: MB 680-506186/19	Result	Qualifier	Added 0.500 1.00		LCS Result 0.514 1.01	mg/l	- Unit mg/L mg/L		lient	<b>%Rec</b> 103 101 99	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110 90 - 110 Sample ID:	11:20 ontrol S ype: To	Samp otal/I
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Nitrate as N Nitrate Nitrite as N Nitrate Nitrite as N Nitrite as N Nitrite as N Nitrite as N Lethod: 375.4-1978 - Sulfate Lab Sample ID: MB 680-506186/19 Matrix: Water	Result	Qualifier	Added 0.500 1.00		LCS Result 0.514 1.01	mg/l	- Unit mg/L mg/L		lient	<b>%Rec</b> 103 101 99	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110 90 - 110 Sample ID:	11:20 ontrol S ype: To 	Samp otal/N
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Nitrate as N Nitrate Nitrite as N Nitrite as N N N N N N N N N N N N N N	Result 0.050	Qualifier	Added 0.500 1.00		LCS Result 0.514 1.01	mg/l	- Unit mg/L mg/L		lient	<b>%Rec</b> 103 101 99	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110 90 - 110 Sample ID:	11:20 ontrol S ype: To 	Samp otal/N
Analyte Vitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Vitrate as N Nitrate Nitrite as N Vitrite as N V	Result 0.050	Qualifier	Added 0.500 1.00		LCS Result 0.514 1.01	mg/l	Unit mg/L mg/L		<u>D</u>	<b>%Rec</b> 103 101 99	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110 90 - 110 Sample ID:	11:20 ontrol S ype: To Method Type: To	Samp otal/I
Analyte Jitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Jitrate as N Jitrate Nitrite as N Jitrate Nitrite as N Jitrite as N ethod: 375.4-1978 - Sulfate Lab Sample ID: MB 680-506186/19 Matrix: Water Analysis Batch: 506186 Analyte	Result 0.050	Qualifier U MB Qualifier	Added 0.500 1.00	0.050	LCS Result 0.514 1.01	mg/l LCS Qualifier	Unit mg/L mg/L	CI	<u>D</u>	Sample %Rec 103 101 99 Client S	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110 90 - 110 Sample ID: Prep T	11:20 ontrol S ype: To Method ype: To zed	bamı otal/l
Analyte Jitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Jitrate as N Vitrate Nitrite as N Vitrate Nitrite as N Vitrite as N Matrix: Water Analysis Batch: 506186 Analyte Sulfate	MB Result	Qualifier U MB Qualifier	Added 0.500 1.00	0.050	LCS Result 0.514 1.01	MDL Unit	Unit mg/L mg/L	C	D P	Sample %Rec 103 101 99 Client S repared	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110 90 - 110 90 - 110 Sample ID: Prep T Analy: 12/12/17	11:20 ontrol S ype: To Method Sype: To zed 14:27	Samı otal/ I Bla otal/ Dil
Analyte Vitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Vitrate as N Vitrate Nitrite as N Vitrate Nitrite as N Vitrate Nitrite as N Vitrate Nitrite as N Vitrate Sample ID: MB 680-506186/19 Matrix: Water Analysis Batch: 506186 Analyte Sulfate Lab Sample ID: LCS 680-506186/20	MB Result	Qualifier U MB Qualifier	Added 0.500 1.00	0.050	LCS Result 0.514 1.01	MDL Unit	Unit mg/L mg/L	C	D P	Sample %Rec 103 101 99 Client S repared	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110 90 - 110 90 - 110 Sample ID: Prep T Analy: 12/12/17 E ID: Lab C	11:20 ontrol S ype: To Method Sype: To zed 14:27 ontrol S	Samı otal/l I Bla otal/l Dil
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Nitrate as N Nitrate Nitrite as N Nitrite as N Nitrite as N Iethod: 375.4-1978 - Sulfate Lab Sample ID: MB 680-506186/19 Matrix: Water Analysis Batch: 506186 Analyte Sulfate Lab Sample ID: LCS 680-506186/20 Matrix: Water	MB Result	Qualifier U MB Qualifier	Added 0.500 1.00	0.050	LCS Result 0.514 1.01	MDL Unit	Unit mg/L mg/L	C	D P	Sample %Rec 103 101 99 Client S repared	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110 90 - 110 90 - 110 Sample ID: Prep T Analy: 12/12/17 E ID: Lab C	11:20 ontrol S ype: To Method Sype: To zed 14:27	Samp otal/I I Bla otal/I Dil
Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Nitrate as N Nitrate Nitrite as N Nitrite as N Iethod: 375.4-1978 - Sulfate Lab Sample ID: MB 680-506186/19 Matrix: Water Analysis Batch: 506186 Analyte Sulfate Lab Sample ID: LCS 680-506186/20 Matrix: Water	MB Result	Qualifier U MB Qualifier	Added 0.500 1.00 0.500	0.050	LCS Result 0.514 1.01 0.496	MDL Unit	Unit mg/L mg/L	C	D P	Sample %Rec 103 101 99 Client S repared	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110 90 - 110 90 - 110 Sample ID: Prep T Analy: 12/12/17 2 ID: Lab C Prep T	11:20 ontrol S ype: To Method Sype: To zed 14:27 ontrol S	Samp otal/N I Bla otal/I Dil I
Analysis Batch: 505672 Analyte Nitrate as N Lab Sample ID: LCS 680-505672/16 Matrix: Water Analysis Batch: 505672 Analyte Nitrate as N Nitrate Nitrite as N Nitrite as N Nitrite as N Iethod: 375.4-1978 - Sulfate Lab Sample ID: MB 680-506186/19 Matrix: Water Analysis Batch: 506186 Analyte Sulfate Lab Sample ID: LCS 680-506186/20 Matrix: Water Analysis Batch: 506186	MB Result	Qualifier U MB Qualifier	Added 0.500 1.00	0.050	LCS Result 0.514 1.01 0.496	MDL Unit	Unit mg/L mg/L	C	D P	Sample %Rec 103 101 99 Client S repared	12/08/17 2 ID: Lab C Prep T %Rec. Limits 75 - 125 90 - 110 90 - 110 90 - 110 Sample ID: Prep T Analy: 12/12/17 E ID: Lab C	11:20 ontrol S ype: To Method Sype: To zed 14:27 ontrol S	I Bla Dil I Dil I

TestAmerica Savannah SSD J//3/18 12/28/2017

# **QC Sample Results**

TestAmerica Job ID: 680-146443-1 SDG: KPS200

Project/Site: 4Q17 LTM GW Sampling - 1403345	5								SDG	KPS200
Lab Sample ID: LCSD 680-506186/22 Matrix: Water Analysis Batch: 506186						Client S	Sam	ple ID: L	ab Control Sar_ Prep Type:	
Analysis Batch. 500 100		Spike	LCSD	LCSD					%Rec.	RPD
Analyte		Added	Result	Qualifie	er Unit		D	%Rec	Limits RF	PD Limit
Sulfate		20.0	18.4	*****	mg/L	•		92	75 - 125	11 30
Method: 415.1-1974 - DOC							-			
 Lab Sample ID: MB 680-506528/2 Matrix: Water								Client S	ample ID: Meth Prep Type: D	
Analysis Batch: 506528										
	IB MB									
Analyte Resu	ult Qualifier	I	RL	MDL U	nit	D	Ρ	repared	Analyzed	Dil Fac
Dissolved Organic Carbon 1	.0 U		1.0	m	g/L				12/13/17 11:45	1

Dissolved Organic Carbon	1.0 U		1.0	mg/L				12/13/17	11:45	1
Lab Sample ID: LCS 680-506528/4						Client	Sample	ID: Lab Co	ontrol S	ample
Matrix: Water								Prep Ty	pe: Diss	olved
Analysis Batch: 506528										
		Spike	LCS	LCS				%Rec.		
Analyte		Added	Result	Qualifier	Unit	D	%Rec	Limits		
Dissolved Organic Carbon		20.0	20.7		mg/L		104	80 - 120		
Lab Sample ID: LCSD 680-506528/5					CI	ient Sam	nple ID: I	Lab Contro	l Sampl	e Dup
Matrix: Water								Prep Ty	pe: Diss	olved
Analysis Batch: 506528										
		Spike	LCSD	LCSD				%Rec.		RPD
Analyte		Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Dissolved Organic Carbon		20.0	20.2		mg/L		101	80 - 120	3	20

#### Method: 415.1-1974 - TOC

Client: Solutia Inc.

Lab Sample ID: MB 680-506527/2										Client	Sample ID:		
Matrix: Water											Prep T	ype: To	tal/NA
Analysis Batch: 506527													
	MB	MB											
Analyte	Result	Qualifier		RL	I	MDL	Unit		D	Prepared	Analyz	ed	Dil Fac
Total Organic Carbon	1.0	U		1.0			mg/L				12/14/17	08:20	1
Lab Sample ID: LCS 680-506527/3									Clier	nt Sampl	e ID: Lab C	ontrol S	ample
Matrix: Water											Prep T	ype: To	tal/NA
Analysis Batch: 506527													
-			Spike		LCS	LCS					%Rec.		
Analyte			Added		Result	Quali	ifier	Unit	D	%Rec	Limits		
Total Organic Carbon			20.0		18.7			mg/L		94	80 - 120		
Lab Sample ID: LCSD 680-506527/4								С	lient Sa	mple ID:	Lab Contro	Sampl	le Dup
Matrix: Water											Prep T	ype: To	tal/NA
Analysis Batch: 506527													
-			Spike		LCSD	LCSI	2				%Rec.		RPD
Analyte			Added		Result	Qual	ifier	Unit	D	%Rec	Limits	RPD	Limit

Method: 415.1-1974 - TOC (Continued)

Lab Sample ID: 680-146443-1 MS Matrix: Water							Cli	ent Sam	ple ID: BSA Prep T	-MW-4E ype: To	
Analysis Batch: 506527										<b>,</b>	
2	Sample	Sample	Spike	MS	MS				%Rec.		
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Total Organic Carbon	4.3		20.0	23.8		mg/L		97	80 - 120		
Lab Sample ID: 680-146443-1 MS	D						Cli	ent Sam	ple ID: BSA	-MW-40	<b>)-12</b> 1
Matrix: Water									Prep T	ype: To	tal/N
Analysis Batch: 506527											
-	Sample	Sample	Spike	MSD	MSD				%Rec.		RF
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Lin
Total Organic Carbon	4.3		20.0	23.7		mg/L		97	80 - 120	0	
Lab Sample ID: MB 310-190007/1 Matrix: Water								Client S	Sample ID: Prep T	Method ype: To	
Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007		MB MB		51	MDI Unit				Prep T	уре: То	otal/N
Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 <sup>Analyte</sup>		MB MB esult Qualifie 5.0 U	ır	RL 5.0	MDL Unit mg/L		D	Client S Prepared	•	ype: To	
Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 Analyte Alkalinity as CaCO3	R	esult Qualifie	ir					Prepared	Prep T Analyz 12/26/17	<b>ype: To</b> zed 19:08	Dil F
Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 Analyte Alkalinity as CaCO3 Lab Sample ID: LCS 310-190007/2	R	esult Qualifie	ir					Prepared	Prep T Analyz 12/26/17 e ID: Lab C	ype: To zed 19:08 -	Dil F
Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 Analyte Alkalinity as CaCO3 Lab Sample ID: LCS 310-190007/2 Matrix: Water	R	esult Qualifie	ır					Prepared	Prep T Analyz 12/26/17 e ID: Lab C	<b>7ype: To</b> zed 19:08	Dil F
Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 Analyte Alkalinity as CaCO3 Lab Sample ID: LCS 310-190007/2 Matrix: Water	R	esult Qualifie	<u> </u>	5.0	mg/L			Prepared	Prep T Analyz 12/26/17 e ID: Lab C Prep T	ype: To zed 19:08 -	Dil F
Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 Analyte Alkalinity as CaCO3 Lab Sample ID: LCS 310-190007/2 Matrix: Water Analysis Batch: 190007	R	esult Qualifie	Spike	5.0 LCS	mg/L		Clien	Prepared t Sample	Prep T Analy: 12/26/17 e ID: Lab C Prep T %Rec.	ype: To zed 19:08 -	Dil F
Aethod: SM 2320B - Alkalinit Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 Analyte Alkalinity as CaCO3 Lab Sample ID: LCS 310-190007/2 Matrix: Water Analysis Batch: 190007 Analyte	R	esult Qualifie	<u> </u>	5.0 LCS	mg/L	Unit		Prepared t Sample	Prep T Analyz 12/26/17 e ID: Lab C Prep T	ype: 7 zed 19:08 ontrol	Fo S

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345 TestAmerica Job ID: 680-146443-1 SDG: KPS200

#### GC/MS VOA

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-146443-1	BSA-MW-4D-1217	Total/NA	Water	8260B	
680-146443-3	BSA-MW-3D-1217	Total/NA	Water	8260B	
680-146443-5	BSA-MW-3D-1217-EB	Total/NA	Water	8260B	
MB 680-506145/9	Method Blank	Total/NA	Water	8260B	
LCS 680-506145/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-506145/4	Lab Control Sample Dup	Total/NA	Water	8260B	
nalysis Batch: 50616	2				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
680-146443-8	CPA-MW-3D-1217	Total/NA	Water	8260B	
680-146443-10	CPA-MW-3D-1217-AD	Total/NA	Water	8260B	
680-146443-11	CPA-MW-1D-1217	Total/NA	Water	8260B	
680-146443-13	4Q17 Trip Blank #3	Total/NA	Water	8260B	
680-146443-14	4Q17 Trip Blank #4	Total/NA	Water	8260B	
MB 680-506162/9	Method Blank	Total/NA	Water	8260B	
LCS 680-506162/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-506162/5	Lab Control Sample Dup	Total/NA	Water	8260B	
nalysis Batch: 50637	8				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146443-6	BSA-MW-2D-1217	Total/NA	Water	8260B	
MB 680-506378/8	Method Blank	Total/NA	Water	8260B	
LCS 680-506378/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-506378/5	Lab Control Sample Dup	Total/NA	Water	8260B	

## GC VOA

#### Analysis Batch: 505591

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batc
680-146443-1	BSA-MW-4D-1217	Total/NA	Water	RSK-175	
680-146443-3	BSA-MW-3D-1217	Total/NA	Water	RSK-175	
680-146443-6	BSA-MW-2D-1217	Total/NA	Water	RSK-175	
680-146443-8	CPA-MW-3D-1217	Total/NA	Water	RSK-175	
680-146443-11	CPA-MW-1D-1217	Total/NA	Water	RSK-175	
MB 680-505591/10	Method Blank	Total/NA	Water	RSK-175	
LCS 680-505591/3	Lab Control Sample	Total/NA	Water	RSK-175	*
LCS 680-505591/7	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-505591/4	Lab Control Sample Dup	Total/NA	Water	RSK-175	
LCSD 680-505591/8	Lab Control Sample Dup	Total/NA	Water	RSK-175	

#### Metals

#### Prep Batch: 505987

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146443-1	BSA-MW-4D-1217	Total Recoverable	Water	3005A	
680-146443-2	BSA-MW-4D-F(0.2)-1217	Dissolved	Water	3005A	
680-146443-3	BSA-MW-3D-1217	Total Recoverable	Water	3005A	
680-146443-4	BSA-MW-3D-F(0.2)-1217	Dissolved	Water	3005A	
680-146443-6	BSA-MW-2D-1217	Total Recoverable	Water	3005A	
680-146443-7	BSA-MW-2D-F(0.2)-1217	Dissolved	Water	3005A	

456

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146443-1 SDG: KPS200

#### Metals (Continued)

#### Prep Batch: 505987 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146443-8	CPA-MW-3D-1217	Total Recoverable	Water	3005A	
680-146443-9	CPA-MW-3D-F(0.2)-1217	Dissolved	Water	3005A	
680-146443-11	CPA-MW-1D-1217	Total Recoverable	Water	3005A	
680-146443-12	CPA-MW-1D-F(0.2)-1217	Dissolved	Water	3005A	
MB 680-505987/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-505987/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
680-146443-1 MS	BSA-MW-4D-1217	Total Recoverable	Water	3005A	
680-146443-1 MSD	BSA-MW-4D-1217	Total Recoverable	Water	3005A	
Analysis Batch: 50623	3				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146443-1	BSA-MW-4D-1217	Total Recoverable	Water	6010C	50598
680-146443-2	BSA-MW-4D-F(0.2)-1217	Dissolved	Water	6010C	505987
680-146443-3	BSA-MW-3D-1217	Total Recoverable	Water	6010C	50598
680-146443-4	BSA-MW-3D-F(0.2)-1217	Dissolved	Water	6010C	50598
680-146443-6	BSA-MW-2D-1217	Total Recoverable	Water	6010C	50598
680-146443-7	BSA-MW-2D-F(0.2)-1217	Dissolved	Water	6010C	50598
680-146443-8	CPA-MW-3D-1217	Total Recoverable	Water	6010C	50598
680-146443-9	CPA-MW-3D-F(0.2)-1217	Dissolved	Water	6010C	50598
680-146443-11	CPA-MW-1D-1217	Total Recoverable	Water	6010C	50598
680-146443-12	CPA-MW-1D-F(0.2)-1217	Dissolved	Water	6010C	50598
MB 680-505987/1-A	Method Blank	Total Recoverable	Water	6010C	50598
LCS 680-505987/2-A	Lab Control Sample	Total Recoverable	Water	6010C	50598
680-146443-1 MS	BSA-MW-4D-1217	Total Recoverable	Water	6010C	50598
000-140443-1 1013					

#### **General Chemistry**

#### Analysis Batch: 189992

A.M. 1					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
680-146443-3	BSA-MW-3D-1217	Total/NA	Water	SM 4500 CO2 C	
680-146443-6	BSA-MW-2D-1217	Total/NA	Water	SM 4500 CO2 C	
680-146443-8	CPA-MW-3D-1217	Total/NA	Water	SM 4500 CO2 C	
680-146443-11	CPA-MW-1D-1217	Total/NA	Water	SM 4500 CO2 C	
Analysis Batch: 1900	07				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
680-146443-3	BSA-MW-3D-1217	Total/NA	Water	SM 2320B	
680-146443-6	BSA-MW-2D-1217	Total/NA	Water	SM 2320B	
680-146443-8	CPA-MW-3D-1217	Total/NA	Water	SM 2320B	
680-146443-11	CPA-MW-1D-1217	Total/NA	Water	SM 2320B	
MB 310-190007/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-190007/2	Lab Control Sample	Total/NA	Water	SM 2320B	
Analysis Batch: 5056	72				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
680-146443-1	BSA-MW-4D-1217	Total/NA	Water	353.2-1993 R2.0	
680-146443-3	BSA-MW-3D-1217	Total/NA	Water	353.2-1993 R2.0	
680-146443-6	BSA-MW-2D-1217	Total/NA	Water	353.2-1993 R2.0	
680-146443-8	CPA-MW-3D-1217	Total/NA	Water	353.2-1993 R2.0	

TestAmerica Savannah 12/28/2017

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

**Client Sample ID** 

Method Blank

CPA-MW-1D-1217

Lab Control Sample

General Chemistry (Continued) Analysis Batch: 505672 (Continued) TestAmerica Job ID: 680-146443-1 SDG: KPS200

Method

353.2-1993 R2.0

353.2-1993 R2.0

353.2-1993 R2.0

Prep Type	Matrix
Total/NA	Water
Total/NA	Water
Total/NA	Water
	Total/NA Total/NA

#### Analysis Batch: 506186

Lab Sample ID

680-146443-11 MB 680-505672/13

LCS 680-505672/16

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146443-1	BSA-MW-4D-1217	Total/NA	Water	375.4-1978	
680-146443-3	BSA-MW-3D-1217	Total/NA	Water	375.4-1978	
680-146443-6	BSA-MW-2D-1217	Total/NA	Water	375.4-1978	
680-146443-8	CPA-MW-3D-1217	Total/NA	Water	375.4-1978	
680-146443-11	CPA-MW-1D-1217	Total/NA	Water	375.4-1978	
MB 680-506186/19	Method Blank	Total/NA	Water	375.4-1978	
LCS 680-506186/20	Lab Control Sample	Total/NA	Water	375.4-1978	
LCSD 680-506186/22	Lab Control Sample Dup	Total/NA	Water	375.4-1978	

#### Analysis Batch: 506187

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146443-1	BSA-MW-4D-1217	Total/NA	Water	325.2-1978	
680-146443-3	BSA-MW-3D-1217	Total/NA	Water	325.2-1978	
680-146443-6	BSA-MW-2D-1217	Total/NA	Water	325.2-1978	
680-146443-8	CPA-MW-3D-1217	Total/NA	Water	325.2-1978	
680-146443-11	CPA-MW-1D-1217	Total/NA	Water	325.2-1978	
MB 680-506187/13	Method Blank	Total/NA	Water	325.2-1978	
LCS 680-506187/14	Lab Control Sample	Total/NA	Water	325.2-1978	
LCSD 680-506187/18	Lab Control Sample Dup	Total/NA	Water	325.2-1978	

#### Analysis Batch: 506527

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batcl
680-146443-1	BSA-MW-4D-1217	Total/NA	Water	415.1-1974	
680-146443-3	BSA-MW-3D-1217	Total/NA	Water	415.1-1974	
680-146443-6	BSA-MW-2D-1217	Total/NA	Water	415.1-1974	
680-146443-8	CPA-MW-3D-1217	Total/NA	Water	415.1-1974	
680-146443-11	CPA-MW-1D-1217	Total/NA	Water	415.1-1974	
MB 680-506527/2	Method Blank	Total/NA	Water	415.1-1974	
LCS 680-506527/3	Lab Control Sample	Total/NA	Water	415.1-1974	
LCSD 680-506527/4	Lab Control Sample Dup	Total/NA	Water	415.1-1974	
680-146443-1 MS	BSA-MW-4D-1217	Total/NA	Water	415.1-1974	
680-146443-1 MSD	BSA-MW-4D-1217	Total/NA	Water	415.1-1974	

#### Analysis Batch: 506528

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146443-2	BSA-MW-4D-F(0.2)-1217	Dissolved	Water	415.1-1974	
680-146443-4	BSA-MW-3D-F(0.2)-1217	Dissolved	Water	415.1-1974	
680-146443-7	BSA-MW-2D-F(0.2)-1217	Dissolved	Water	415.1-1974	
680-146443-9	CPA-MW-3D-F(0.2)-1217	Dissolved	Water	415.1-1974	
680-146443-12	CPA-MW-1D-F(0.2)-1217	Dissolved	Water	415.1-1974	
MB 680-506528/2	Method Blank	Dissolved	Water	415.1-1974	
LCS 680-506528/4	Lab Control Sample	Dissolved	Water	415.1-1974	
LCSD 680-506528/5	Lab Control Sample Dup	Dissolved	Water	415.1-1974	

Prep Batch

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146443-1 SDG: KPS200

## **General Chemistry (Continued)**

#### Analysis Batch: 507269

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146443-1	BSA-MW-4D-1217	Total/NA	Water	310.1-1978	
MB 680-507269/1	Method Blank	Total/NA	Water	310.1-1978	
LCS 680-507269/5	Lab Control Sample	Total/NA	Water	310.1-1978	
LCSD 680-507269/13	Lab Control Sample Dup	Total/NA	Water	310.1-1978	

4 5 7 8 9 10 11 12 13 14

1

5

1

506186

506527

505672 12/08/17 11:30 AMH

12/13/17 08:21 ALG

12/14/17 10:01 KLD

# Client Sample ID: BSA-MW-4D-1217

#### Lab Sample ID: 680-146443-1 Matrix: Water

Lab

TAL SAV TAL SAV TAL SAV

TAL SAV TAL SAV TAL SAV

TAL SAV

TAL SAV

TAL SAV

Lab Sample ID: 680-146443-2

Lab Sample ID: 680-146443-3

Matrix: Water

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared	
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst
Total/NA	Analysis	8260B		20	506145	12/13/17 03:20	UI
Total/NA	Analysis	RSK-175		1	505591	12/08/17 11:34	KAB
Total Recoverable	Prep	3005A			505987	12/11/17 18:01	BCB
Total Recoverable	Analysis	6010C		1	506233	12/13/17 02:26	BWR
Total/NA	Analysis	310.1-1978		1	507269	12/14/17 19:11	KLD
Total/NA	Analysis	325.2-1978		5	506187	12/13/17 08:52	ALG

353.2-1993 R2.0

375.4-1978

415.1-1974

#### Client Sample ID: BSA-MW-4D-F(0.2)-1217

Analysis

Analysis

Analysis

Date Collected: 12/06/17 08:45 Date Received: 12/07/17 09:15

Total/NA

Total/NA

Total/NA

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			505987	12/11/17 18:01	BCB	TAL SAV
Dissolved	Analysis	6010C		1	506233	12/13/17 03:23	BWR	TAL SAV
Dissolved	Analysis	415.1-1974		1	506528	12/13/17 15:59	KLD	TAL SAV

#### Client Sample ID: BSA-MW-3D-1217

Date Collected: 12/06/17 09:45 Date Received: 12/07/17 09:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		20	506145	12/13/17 03:42	UI	TAL SAV
Total/NA	Analysis	RSK-175		1	505591	12/08/17 11:46	KAB	TAL SAV
Total Recoverable	Prep	3005A			505987	12/11/17 18:01	BCB	TAL SAV
Total Recoverable	Analysis	6010C		1	506233	12/13/17 03:02	BWR	TAL SAV
Total/NA	Analysis	325.2-1978		10	506187	12/13/17 08:52	ALG	TAL SAV
Total/NA	Analysis	353.2-1993 R2.0		1	505672	12/08/17 11:31	AMH	TAL SAV
Total/NA	Analysis	375.4-1978		1	506186	12/12/17 15:30	ALG	TAL SAV
Total/NA	Analysis	415.1-1974		1	506527	12/14/17 10:45	KLD	TAL SAV
Total/NA	Analysis	SM 2320B		1	190007	12/26/17 19:08	BER	TAL CF
Total/NA	Analysis	SM 4500 CO2 C		1	189992	12/26/17 10:06	LBB	TAL CF

#### Client Sample ID: BSA-MW-3D-F(0.2)-1217 Date Collected: 12/06/17 09:45 Date Received: 12/07/17 09:15

99994-	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			505987	12/11/17 18:01	BCB	TAL SAV

Matrix: Water

Lab Sample ID: 680-146443-4

ate Collected: 12 ate Received: 12	2/06/17 09:4						Barr Gel B	- sumpro ib	: 680-146443-4 Matrix: Wate
	Batch	Batch		Dilution	Batch	Prepared			
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Dissolved	Analysis	6010C		1	506233	12/13/17 03:44	BWR	TAL SAV	
Dissolved	Analysis	415.1-1974		1	506528	12/13/17 16:16	KLD	TAL SAV	
lient Sample	ID: BSA-N	IW-3D-1217-EB					Lat	o Sample ID	: 680-146443-
ate Collected: 12 ate Received: 12		-							Matrix: Wate
	Batch	Batch		Dilution	Batch	Prepared			
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Analysis	8260B		1	506145	12/13/17 04:04	UI	TAL SAV	
lient Sample	ID: BSA-N	IW-2D-1217					Lal	o Sample ID	: 680-146443-
ate Collected: 12 ate Received: 12									Matrix: Wate
	Batch	Batch		Dilution	Batch	Prepared			
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Analysis	8260B		100	506378	12/14/17 20:08	EMA	TAL SAV	
Total/NA	Analysis	RSK-175		1	505591	12/08/17 11:59	КАВ	TAL SAV	
Total Recoverable	Prep	3005A			505987	12/11/17 18:01	BCB	TAL SAV	
Total Recoverable	Analysis	6010C		1	506233	12/13/17 03:07	BWR	TAL SAV	
Total/NA	Analysis	325.2-1978		5	506187	12/12/17 15:45	ALG	TAL SAV	
Total/NA	Analysis	353.2-1993 R2.0		1	505672	12/08/17 11:35	AMH	TAL SAV	
Total/NA	Analysis	375.4-1978		1	506186	12/12/17 15:30	ALG	TAL SAV	
Total/NA	Analysis	415.1-1974		1	506527	12/14/17 11:02	KLD	TAL SAV	
Total/NA	Analysis	SM 2320B		1	190007	12/26/17 19:08	BER	TAL CF	
Total/NA	Analysis	SM 4500 CO2 C		1	189992	12/26/17 10:09	LBB	TAL CF	
	ID: BSA-N	/W-2D-F(0.2)-12	17				La	b Sample ID	: 680-146443-
lient Sample		-							Matrix: Wat
ate Collected: 1	2/07/17 09:1			Dilution	Batch	Prepared			
ate Collected: 12 ate Received: 12	Batch	Batch			Number	or Analyzed	Analyst	Lab	
ate Collected: 12 ate Received: 12 Prep Type	Batch Type	Method	Run	Factor		1011112 10 5	DOF	TAL 6	
ate Collected: 12 ate Received: 12 Prep Type Dissolved	Batch Type Prep	Method 3005A	Run		505987	12/11/17 18:01	BCB	TAL SAV	
ate Collected: 12 ate Received: 12 Prep Type Dissolved Dissolved	Batch Type Prep Analysis	Method 3005A 6010C	Run	1	505987 506233	12/13/17 03:39	BWR	TAL SAV	
ate Collected: 12 ate Received: 12 Prep Type	Batch Type Prep	Method 3005A	Run		505987				

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		5	506162	12/13/17 16:48	EMA	TAL SAV

# Client Sample ID: CPA-MW-3D-1217

Date Collected: 12/06/17 11:45

#### Lab Sample ID: 680-146443-8 Matrix: Water

Date Received: 12/07/17 09:15

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	505591	12/08/17 12:12	KAB	TAL SAV
Total Recoverable	Prep	3005A			505987	12/11/17 18:01	BCB	TAL SAV
Total Recoverable	Analysis	6010C		1	506233	12/13/17 03:13	BWR	TAL SAV
Total/NA	Analysis	325.2-1978		2	506187	12/12/17 15:45	ALG	TAL SAV
Total/NA	Analysis	353.2-1993 R2.0		1	505672	12/08/17 11:36	AMH	TAL SAV
Total/NA	Analysis	375.4-1978		2	506186	12/13/17 08:30	ALG	TAL SAV
Total/NA	Analysis	415.1-1974		1	506527	12/14/17 11:19	KLD	TAL SAV
Total/NA	Analysis	SM 2320B		1	190007	12/26/17 19:08	BER	TAL CF
Total/NA	Analysis	SM 4500 CO2 C		1	189992	12/26/17 10:12	LBB	TAL CF

#### Client Sample ID: CPA-MW-3D-F(0.2)-1217

Date Collected: 12/06/17 11:45 Date Received: 12/07/17 09:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			505987	12/11/17 18:01	BCB	TAL SAV
Dissolved	Analysis	6010C		1	506233	12/13/17 03:33	BWR	TAL SAV
Dissolved	Analysis	415.1-1974		1	506528	12/13/17 16:53	KLD	TAL SAV

#### Client Sample ID: CPA-MW-3D-1217-AD

Date Collected: 12/06/17 11:45

Date Received: 12/07/17 09:15

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		5	506162	12/13/17 17:10	EMA	TAL SAV

### Client Sample ID: CPA-MW-1D-1217 Date Collected: 12/06/17 14:00

Date Received: 12/07/17 09:15

Lab	Sample	ID:	680-146443-10
			Matrix: Water

Lab Sample ID: 680-146443-9

Matrix: Water

#### Lab Sample ID: 680-146443-11 Matrix: Water

Batch Batch Dilution Batch Prepared Method Prep Type Туре Run Factor Number or Analyzed Analyst Lab Total/NA Analysis 8260B 250 506162 12/13/17 17:31 EMA TAL SAV Total/NA Analysis **RSK-175** 505591 12/08/17 12:25 1 KAR TAL SAV Total Recoverable Prep 3005A 505987 12/11/17 18:01 BCB TAL SAV **Total Recoverable** Analysis 6010C 1 506233 12/13/17 03:18 BWR TAL SAV Total/NA 325.2-1978 Analysis 10 TAL SAV 506187 12/13/17 08:52 ALG Total/NA 353.2-1993 R2.0 Analysis 1 505672 12/08/17 11:37 AMH TAL SAV Total/NA Analysis 375.4-1978 TAL SAV 506186 12/13/17 08:18 ALG 1 Total/NA Analysis 415.1-1974 1 506527 12/14/17 12:06 KLD TAL SAV Total/NA SM 2320B Analysis 1 190007 12/26/17 19:08 BER TAL CF Total/NA Analysis SM 4500 CO2 C 189992 12/26/17 10:59 LBB TAL CF 1

TestAmerica Savannah SD 2/13/18 12/28/2017

lient Sample ID: ate Collected: 12/00 ate Received: 12/07	6/17 14:0	-	17				Lab	Sample ID: 680-14 Mat	16443-12 trix: Water
	Batch	Batch		Dilution	Batch	Prepared			
	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Dissolved	Prep	3005A			505987	12/11/17 18:01	BCB	TAL SAV	
Dissolved	Analysis	6010C		1	506233	12/13/17 03:28	BWR	TAL SAV	
Dissolved	Analysis	415.1-1974		1	506528	12/13/17 17:10	KLD	TAL SAV	
lient Sample ID: ate Collected: 12/0	6/17 00:0	0					Lab	Sample ID: 680-14 Ma	46443-13 trix: Water
ate Received: 12/07	7/17 09:1	5							
	7/17 09:1	5 Batch		Dilution	Batch	Prepared			
			Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab	
Prep Type	Batch	Batch	Run				Analyst EMA	Lab TAL SAV	
Prep Type	Batch Type Analysis	Batch Method 8260B	Run	Factor	Number	or Analyzed	EMA		46443-14
Prep Type Fotal/NA	Batch Type Analysis : 4Q17	Batch Method 8260B	Run	Factor	Number	or Analyzed	EMA	TAL SAV	46443-14 trix: Water
Prep Type Total/NA lient Sample ID:	Batch Type Analysis : 4Q17 1 6/17 00:0	Batch Method 8260B Frip Blank #4	Run	Factor	Number	or Analyzed	EMA	TAL SAV	
Prep Type Fotal/NA lient Sample ID: ate Collected: 12/07 ate Received: 12/07	Batch Type Analysis : 4Q17 1 6/17 00:0	Batch Method 8260B Frip Blank #4	Run	Factor	Number	or Analyzed	EMA	TAL SAV	
Prep Type Total/NA lient Sample ID: ate Collected: 12/00 ate Received: 12/00	Batch Type Analysis : 4Q17 7 6/17 00:0 7/17 09:11	Batch Method 8260B Frip Blank #4 0 5	Run	11	Number 506162	or Analyzed 12/13/17 14:38	EMA	TAL SAV	

Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

TestAmerica Savannah 12/28/2017

<b>TestAmerica Savannah</b> 5102 LaRoche Avenue		Che	in o	Chain of Custody Record	ody R	leco	P			<b>TestAmerica</b>
Savannah, GA 31404 phone 912.354.7858 fax	Regulatory Program:	MO	[]NPDES	CRCRA	Other:				Tes	TestAmerica Laboratories, Inc.
Client Contact	Project Manager: Aman	Amanda Derhake	Sil	Site Contact: Samantha DiCenso	Samanthi	a DiCen	so Date:	te:	COC No:	
Golder Associates Inc.	Tel/Fax: 636-724-9191		La	Lab Contact: Michele Kersey	Michele K	ersey	Ca	Carrier: FedEx	7	of <b>2</b> COCs
820 South Main Street	Analysis Turna	Turnaround Time			Þ'S				Sampler	
St. Charles, MO 63301	CALENDAR DAYS	WORKING DAYS		(	-				ForL	For Lab Use Only:
(636) 724-9191 Phone	TAT if different from	int from Below Standard	(	N /			00		Walk-	Walk-in Client
(636) 724-9323 FAX	2 weeks	S	N /	_			109		Lab S	Lab Sampling:
Project Name: 4Q17 LTM GW Sampling-1403345			¥)		15/2		γy			
Site; Solutia WG Krummrich Plant P O # 42562863	2 days		alqm	09	325	2 83			/ qor	Job / SDG No.:
		Sample 1	182	85	βÀ	e A				
Sample Identification	Sample Sample (c Date Time c	Matrix	Cont.	Fotat Fe/ VOCs by	Alk/CO2 Chloride Dissolved	Nitrate by	DOC PA			Sample Specific Notes.
BSA-MW-40-1217 N	5290 11/1/21	S W	N N	31	1 1 3	23				
854-MW-4D-F/02)-1217	-7	1	4. 4				13			
BSA - MW- 3D-1217 -	0545		M M	31	1 1 3	23				
- MM - 1989	-1		7 7				1 2			
	0/4/		3 1	30						
4 BSA - MW - 20- 1217 V	1040		N PI	5 1	113	2 2				
2 BSA - MW - 2D - P(0,2) - 12-17 .			4 1				13			
	5411		N N	31	1 1 3	2 3		680-146443	680-146443 Chain of Custo	
1 LIJ-(2)-H-3D-H(0,2)-1211			4 4				13			
(PA-MW-30-121-AD :			3 N	3						
CPA-WW- 10-1217 4	0921		N N	31	113	2 3				
A LUN- (2.9) - 41 - MM - HJ )	+		Y N				1 3			
Preservation Used: 1= ice, 2= HCI; 3= i	5=NaOH; 6= Other			2 4	1 1 2	1,3 3	4 3		10 00 00 00 00 00 00 00 00 00 00 00 00 0	
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Comments Section if the lab is to dispose of the sample.	Please List any EPA Waste Codes for the sample in the	for the sample in	the	Sample Disposal (A fee may be assessed if	sposal (A	fee ma	y be as:	sessed if samples an	e retained long	samples are retained longer than 1 month)
	Poison B	Unknown		<b>Return to Clent</b>	to Client		Cipisposal by Lab		Archive for	_ Months
W Special Instructions/QC Requirements & Comments: VOC headspace upon sampling: Yes/No				NS.	.00	J.	9	101(5	52	
Custody Seals Intact:   . Yes  . No	Custody Seal No.:				Cooler Temp.		("C), Obs'd	Corrd:	Therr	Iherm ID No.
Religuested by Rechard	Company	Date/Time	1530	Received by	y.			Company:	Date/Time	Time
Refinduished by	Company:	Date/Time:	ài	Received by	sy:			Company:	Date	Date/Time:
Relinquished by:	Company:	Date/Time	03	Received in Laboratory	n Labora	Kale	0	& company.	Date	DaterTime: DIANA OGIS
017			)	1				Form	Form No. CA-C-WI-D02, Rev.	002, Rev. 4.3, dated 12/05/2013
			1		3	1	- Autorativ		2	1 2 3 4

TestAmerica The Leader In Environmental Testing	COC No:	Z of Z COCs	Sampler: JAP	For Lab Use Unly: Walk-in Client:	Lab Sampling:	Job / SDG No.:		Sample Specific Notes:							and the state of the set of the s	ained longer than 1 month)	or Months	3.5	Therm ID No.:	Date/Time:	Date/Time;	Date/Time: 1217417-0755	Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013	1 2 3 4 5 6
st	ERCM L.Dher: Site Contact: Samantha DiCenso Date:	Lab Contact: Michele Kersey Carrier: FedEx	Þ 52	521	, KSK	Wu p) See p) Ses S/S 101 101	1 5 1 5	DOC pÀ 4 DISCOL pÀ 4 DISCOL pÀ 4 Ultais pÀ DISCOL qui the DISCOL q							2 4 1 1 2 13 3 4 3	e Disposal (A fee may be a	Elketurn to Cilent [30isposal by Lab ]	2/4.0 CCF - 0.2)1.01	Cooler Temp. ("C) Obs'd Corr'd:	Received by Company.	Received by: Company:	Received in Laborator Dy Company		7 8 9 10 11 12 13
$\sim$	Project Manager: Amanda Derhake Site Cont		Is Turna		2 weeks	asw	/ SW Alep 1	Sample Sample Sample Sample Sample Sample Sample Type # of # o	<u></u> <u> </u>							te Codes for the sample in the	Poison B Unknown		Custody Seal No	Date/Time:	Date/Time:	Company. Date/Time: Rec	5	15
<b>TestAmerica Savannah</b> $O SO - IUQ UA$	Client Contact	Golder Associates Inc. Te		St. Charles, MO 63301 (636) 724-9191 (636) 724-9191	(636) 724-9323 FAX	Project Name: 40,17,4,17% GW Santping-1405345 Site: Solutia WG Krummrich Plant	P O # 42262863	S Sample Identification	4217 Trip Bhik #3			of 5		5	C Preservation Used: 1= ice, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other	Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Comments Section if the lab is to dispose of the sample.	Won-Hazard Flammable USkin trritant	Comments: VOC headspace upon sampling: Yes/No	Custody Seals Intact_ D Yes D No	Mand 16	Relinquishey	Relinquished by.		

TestAmeric

THE LEADER IN ENVIRONMENTAL TESTING

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12 13

680-146443 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information	&. <sup>1</sup> •***	े भ	14 1 1.HT	teritor an	
Client: TA- Scivanneh					
City/State:	STATE	Project:		*	
Receipt Information	राज्य हरू	ap 11 15 1		1244	
Date/Time Received:   12/23/17	1005	Received By: MR			
Delivery Type: UPS X Fee	IEX Del	FedEx Ground	US Mail		Spee-Dee
🗌 TA Courier 🔲 TA	Field Services	Client Drop-off	Other:		opec bec
Condition of Cooler/Containers	a distriction	· · · · · · · · · · · · · · · · · · ·			A MARKEN
Sample(s) received in Cooler?		If yes: Cooler ID:			11. BAN 209 1. 18
Multiple Coolers?	es 🕅 No	If yes: Cooler #	of		
Cooler Custody Seals Present?	es No No	JI f yes: Cooler custo	dy seals intact	? 🕅 Yes	No
Sample Custody Seals Present?	es 🔀 No	If yes: Sample custo	dy seals intac	t? 🗌 Yes	No
Trip Blank Present?	es 🛛 No	If yes: Which VOA s	amples are in	cooler? 1	
			~		
Temperature Record		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1	123. 3	
Coolant: Wet ice Blue ice				NONE	时( 建筑)
Thermometer ID: T		Correction Factor (°	L C): +0.1		
• Temp Blank Temperature – If no temp blank,	ortemp blank tem			Carbon m	
Uncorrected Temp (°C): (), 7		Corrected Temp (°C		Container Le	mperature 22
Sample Container Temperature	四日日期前的			a series to be	anti-
Sample ID(s) & bottle type used:	AMER 1		INTAINER 2	A Shine Stat	言語を定め
Uncorrected Temp (°C):	TEMP 2	Corrected Temp (°C	TEMP 1	TEN	172
Exceptions Noted	·按书书见:2423			1 The second se	Fatterster
1) If temperature exceeds criteria, was				es 🗌	N NAME OF COME
a) If yes: Is there evidence that th				es 🗌	No
		•		d	No
<ol> <li>If temperature is &lt;0°C, are there of (e.g., bulging septa, broken/cracked)</li> </ol>	vious signs tha d bottles?)	t the integrity of samp	ole containers	is compro	mised?
NOTE: If yes, contact PM before proceeding	If no, proceed w				u
Additional Comments					
				1	
		· · · · · · · · · · · · · · · · · · ·			
Document: CF-LG-WI-002 Revision: 22			General term		
Date: 11/27/2015	TestAmerica	Cedar Falls	Bacteria temp		eria is 0 to 6°C

TestAmerica-Cedar Falls Page 45 of 50

criteria is 0 to 6" Bacteria temperature criteria is 0 to  $10^{\circ}$ C 12/28/2017

stAmerica Savannah	2 LaRoche Avenue
TestA	5102 La

Chain of Custody Record



Clarint Michael         Sound         Condition         Sound         Condition         Sound         Soun	Phone (912) 354-7858 Fax (912) 352-0165				h (
Control         Total         <		Sampler.	Lah PM Kersey, Michele R	Carrier Tracking No(s);	COC No: 680-502683,1
Contraction		Phone:	E-Mait: michele.kersey@testamericainc.com	State of Origin; Illinois	Page 1 of 1 Page 1 of 1
Clinitization         Clinitentitization         Clinitization         Cli	Company. TestArnerica Laboratories, inc		Accreditations Required (See note): NELAP - Iltinois		Job #: 680-146443-1
Control         International         International<	Addrass: 704 Enterprise Drive,	Due Date Requested: 12/22/2017	Analysis	s Requested	des:
Thread         Total         Total <t< td=""><td>Cily Cedar Falls State, Zip IA, 50613</td><td>TAT Requested (days):</td><td></td><td></td><td></td></t<>	Cily Cedar Falls State, Zip IA, 50613	TAT Requested (days):			
Desil         Desil         Analytic         Ender	77-2401(Tel)	PO#	2010		
	Email	.# OM	(on		
	Project Name: WGK Long Term Monitoring (LTM)	Project #; 88001754	110 89		4
	Site	#MOSS	A BD (A	01 CO	Other:
	Sample Identification - Client ID (Lab ID)	Sample Time	Matrix Matrix (wwweek Sepolut Covershold Covershold Field Filtfered Covershold		Special Instructions/Note:
		X	ation Code:		
	10.0000000		×		
and the second		-	×		
		-	×		
	-		×		
and the second					
and the second	and the second second second	ta Laboratorias, inc. places the ownersthip of matricel, er ar Laboratorias, inc. places the ownersthip of matricel, er are construction and and practicel, the samples more	alyte & accreditation compliance upon out subcontract laboration alyte & accreditation compliance upon out subcontract laboration providence on the TestAmerica laboratory or other instructio	lories. This sample shipment is forwarded under one will be provided. Any changes to accreduate	chain-of-custody. If the Jaboratory does not on status should be brought to TestAmerica
Uncontinued     return to cuern     uspace     return     uspace       Empty kit Reinquished by:     Empty kit Reinquished by:     Date:     Time:     Time: <td>and the second second</td> <td>February in the second provide set times form of the second second</td> <td>Sample Disposal ( A fee ma)</td> <td>y be assessed if samples are retain</td> <td>ed longer than 1 month)</td>	and the second	February in the second provide set times form of the second second	Sample Disposal ( A fee ma)	y be assessed if samples are retain	ed longer than 1 month)
Empty Kit Relinquished by:     Date:     Time:     Method of Shipment:       Relinquished by:     Method Shipment:     Method of Shipment:     Method of Shipment:       Relinquished by:     Method by:     Method of Shipment:     Date/Time:       Relinquished by:     Method by:     Method of Shipment:     Date/Time:       Relinquished by:     Method by:     Method by:     Method by:       Relinquished by:     Date/Time:     Date/Time:     2000 5       Relinquished by:     Company     Received by:     Date/Time:       Custody Seals Intact:     Custody Seals Intact:     Custody Seals Intact:     Custody Seals Intact:	SHOW STREET	iverable Rank;	Special Instructions/QC Requi		
Relativished by:     Company     Received by:     Muth Zult     Date/Time:     U/23/L7     005     Company       Relativished by:     I.2./22/L7     I.2./22/L7     I.2./22/L7     I.2./23/L7     I.0.05     Company       Relativished by:     Date/Time:     Date/Time:     Date/Time:     U/23/L7     I/005     Company       Relativished by:     Company     Received by:     Received by:     Date/Time:     Date/Time:     Company       Custody Seals Intact:     Custody Seals Intact: <td>Empty Kit Relinguished by:</td> <td>Date:</td> <td>Time:</td> <td>Mathod of Shipmant</td> <td></td>	Empty Kit Relinguished by:	Date:	Time:	Mathod of Shipmant	
Reference by: Company Received by. Date/Time. Date/Time. Company Received by. Date/Time. Date/Time. Company Received by. Concertine. Company Received by. Concertine. Company Received by. Custody Seals Intact: Custody Sea	Belinguished by Tolling		Received by:	14	1005 Company
Reinquished by Date/Time. Date/Time. Company Received by Date/Time. Date/Time. Custody Seals Intact: Custody Seal No.:	Belinguish			Date/Time:	Company
Custody Seals Intact: Custody Seal No.:	- Andrewson	Date/Time		Date/Time:	Сатряпу
	Custody Seals Intact:		Cooler Temperature(s) *C and O	Wher Remarks	

13

# Login Sample Receipt Checklist

Client: Solutia Inc.

Login Number: 146443 List Number: 1

Creator: Edwards, Jessica R

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 680-146443-1

List Source: TestAmerica Savannah

SDG Number: KPS200

12/28/2017

# Login Sample Receipt Checklist

Client: Solutia Inc.

Login Number: 146443 List Number: 2

Creator: Hummel, Matt R

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 680-146443-1 SDG Number: KPS200

List Source: TestAmerica Cedar Falls

List Creation: 12/23/17 10:40 AM

12/28/2017

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345 TestAmerica Job ID: 680-146443-1 SDG: KPS200

#### Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

uthority	Program	EPA Region	Identification Number	Expiration Date
	AFCEE		SAVLAB	
labama	State Program	4	41450	06-30-18
laska	State Program	10		06-30-18
laska (UST)	State Program	10	UST-104	11-05-17 *
rizona	State Program	9	AZ808	12-14-18
rkansas DEQ	State Program	6	88-0692	02-01-19
alifornia	State Program	9	2939	06-30-18
olorado	State Program	8	N/A	12-31-17
onnecticut	State Program	1	PH-0161	03-31-19
lorida	NELAP	4	E87052	06-30-18
A Dept. of Agriculture	State Program	4	N/A	06-12-18
Georgia	State Program	4	803	06-30-18
Buam	State Program	9	15-005r	04-16-18
lawaii	State Program	9	N/A	06-30-18
linois	NELAP	5	200022	11-30-18
ndiana	State Program	5	N/A	06-30-18
owa	State Program	7	353	06-30-19
(entucky (DW)	State Program	4	90084	12-31-18
Centucky (UST)	State Program	4	18	06-30-18
entucky (WW)	State Program	4	90084	12-31-18 *
-А-В	DoD ELAP		L2463	09-22-19
-A-B	ISO/IEC 17025		L2463.01	09-22-19
ouisiana	NELAP	6	30690	06-30-18
ouisiana (DW)	NELAP	6	LA160019	12-31-18
laine	State Program	1	GA00006	09-24-18
laryland	State Program	3	250	12-31-17
lassachusetts	State Program	1	M-GA006	06-30-18
lichigan	State Program	5	9925	06-30-18
/ississippi	State Program	4	N/A	06-30-18
lebraska	State Program	7	TestAmerica-Savannah	06-30-18
lew Jersey	NELAP	2	GA769	06-30-18
lew Mexico	State Program	6	N/A	06-30-18
lew York	NELAP	2	10842	03-31-18
North Carolina (DW)	State Program	4	13701	07-31-18
North Carolina (WW/SW)	State Program	4	269	12-31-18
Oklahoma	State Program	6	9984	08-31-18
Pennsylvania	NELAP	3	68-00474	06-30-18
Puerto Rico	State Program	2	GA00006	12-31-17
South Carolina	State Program	4	98001	06-30-18
fennessee	State Program	4	TN02961	06-30-18
	NELAP	6	T104704185-16-9	
Texas Texas				11-30-18
exas	State Program	6	T104704185	06-30-18
JS Fish & Wildlife	Federal		LE058448-0	07-31-18
JSDA	Federal	2	SAV 3-04	06-14-20 *
/irginia	NELAP	3	460161	06-14-18
Washington	State Program	10	C805	06-10-18
Nest Virginia (DW)	State Program	3	9950C	12-31-17
Nest Virginia DEP	State Program	3	094	06-30-18
Nisconsin	State Program	5	999819810	08-31-18

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Savannah SJD 213/18 12/28/2017

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345 TestAmerica Job ID: 680-146443-1 SDG: KPS200

#### Laboratory: TestAmerica Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	IHLAP		101044	11-01-18
Georgia	State Program	4	IA100001 (OR)	09-29-18
Illinois	NELAP	5	200024	11-29-18
Iowa	State Program	7	007	12-01-17 *
Kansas	NELAP	7	E-10341	01-31-18
Minnesota	NELAP	5	019-999-319	12-31-18
Minnesota (Petrofund)	State Program	1	3349	08-22-18
North Dakota	State Program	8	R-186	09-29-18
Oregon	NELAP	10	IA100001	09-29-18

TestAmerica Savannah ろつD J/J3/18 12/28/2017



#### Level IV Data Validation Summary Solutia Inc., W.G. Krummrich, Sauget, Illinois 4Q17 Long-Term Monitoring Program

Company Name: <u>Golder Associates</u> Project Name: <u>WGK-4Q17 LTM</u> Reviewer: <u>S. DiCenso</u> Laboratory: <u>TestAmerica</u> SDG#: <u>KPS201</u> Matrix: Water Project Manager: <u>A. Derhake</u> Project Number: <u>140-3345</u> Sample Date: <u>December 2017</u>

Analytical Method: VOC (8260B), Dissolved Gases (RSK-175), Metals (6010C), Alkalinity (SM 2320B), Carbon Dioxide (SM 4500 CO2C), Chloride (325.2), Nitrogen, Nitrate-Nitrite (353.2), Sulfate (375.4), TOC (415.1), and DOC (415.1)

Sample Names: <u>CPA-MW-2D-1217</u>, <u>CPA-MW-2D-F(0.2)-1217</u>, <u>CPA-MW-2D-1217-AD</u>, <u>BSA-MW-1S-1217</u>, <u>BSA-MW-1S-1217</u>, <u>BSA-MW-1S-1217-EB</u>, <u>4Q17 LTM Trip Blank #4</u>

Field	Information	YES	NO	NA
a)	Sampling dates noted?	$\boxtimes$		
b)	Does the laboratory narrative indicate deficiencies?	$\boxtimes$		

#### Comments:

VOC: Samples CPA-MW-2D, CPA-MW-2D-AD, and BSA-MW-1S required dilution prior to analysis, reporting limits were adjusted accordingly.

Dissolved Gases: Samples CPA-MW-2D and BSA-MW-1S were analyzed with significant headspace in the sample containers.

Metals: No deficiencies noted.

Alkalinity: Due to instrument failure, samples CPA-MW-2D and BSA-MW-1S sent to an alternate lab and analyzed outside of hold time.

Chloride: Sample BSA-MW-1S required dilution prior to analysis, reporting limits were adjusted accordingly.

*Nitrate-Nitrite as Nitrogen:* Nitrate exceeded the recovery criteria low for the MS and MSD of sample BSA-MW-1S in batch 505753.

Sulfate: Samples CPA-MW-2D and BSA-MW-1S required dilution prior to analysis, reporting limits were adjusted accordingly.

TOC: No deficiencies noted.

DOC: No deficiencies noted.

Free Carbon Dioxide: No deficiencies noted.

#### Chain-of-Custody (COC)

- a) Was the COC signed by both field and laboratory personnel?
- b) Were samples received in good condition?

YES	NO	NA
$\bowtie$		
$\boxtimes$		

Comments: Samples were received at 3.7°C, 4.1°C, and 4.5°C, within the 0°C to 6°C criteria.



	February 2018	2		140-3345
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Gene	ral	YES	NO	NA
a)	Were hold times met for sample analysis?		$\boxtimes$	
b)	Were the correct preservatives used?	$\boxtimes$		
c)	Was the correct method used?		$\boxtimes$	
d)	Any sample dilutions noted?	$\boxtimes$		

**Comments:** <u>Due to instrument failure, samples were sent to an alternate lab and were analyzed under a different method for</u> <u>alkalinity (SM 2320B) and free carbon dioxide (SM 4500 CO2C).</u> The instrument failure and sample re-shipment resulted in alkalinity, carbon dioxide, and nitrate analyzed outside of hold time.

Detections in diluted analysis were qualified.

GC/MS Instrument Performance Check (IPC) and Internal Standards (IS)			NO	NA					
a)	IPC analyzed at the appropriate frequency and met the appropriate standards?	$\boxtimes$							
b)	Does BFB/DFTPP meet the ion abundance criteria?	$\boxtimes$							
c)	Internal Standard retention times and areas met appropriate criteria?	$\boxtimes$							
Co	Comments: None.								
Calib	prations	YES	NO	NA					
a)	Initial calibration analyzed at the appropriate frequency and met the appropriate standards?	$\boxtimes$							
b)	b) Continuing calibrations analyzed at the appropriate frequency and met the appropriate standards?								
		$\boxtimes$							
c)	c) Initial calibration verifications and blanks analyzed at the appropriate frequency and met the appropriate standards?								
			$\boxtimes$						
d)	Continuing calibration verifications and blanks analyzed at the appropriate frequency and met the	approp	oriate	standards?					
Co	mments: Some compounds did not meet calibration requirements, data was qualified as required.		$\boxtimes$						
Blanks									
Blan	lks	YES	NO	NA					
Blan a)	<b>Iks</b> Were blanks (trip, equipment, method) performed at required frequency?	YES ⊠	NO	NA					
		-		_					
a) b)	Were blanks (trip, equipment, method) performed at required frequency?	$\boxtimes$							
a) b) <u>Co</u> <u>Bei</u>	Were blanks (trip, equipment, method) performed at required frequency? Were analytes detected in any blanks?	$\boxtimes$							
a) b) <u>Co</u> <u>Bei</u>	Were blanks (trip, equipment, method) performed at required frequency? Were analytes detected in any blanks? Imments: Equipment blank for BSA-MW-1S was submitted with SDG KPS201. Inzene and chlorobenzene were detected in the EB. No qualification was required due to analytes e	$\boxtimes$		cted in					
a) b) <u>Co</u> <u>Bei</u>	Were blanks (trip, equipment, method) performed at required frequency? Were analytes detected in any blanks? Imments: Equipment blank for BSA-MW-1S was submitted with SDG KPS201. Inzene and chlorobenzene were detected in the EB. No qualification was required due to analytes esociated sample, or detected at concentrations significantly greater than the EB detections.	⊠ ⊠ either n	ot det	cted in					
a) b) <u>Co</u> <u>Be</u> <u>ass</u> Matri	Were blanks (trip, equipment, method) performed at required frequency? Were analytes detected in any blanks? Imments: Equipment blank for BSA-MW-1S was submitted with SDG KPS201. Inzene and chlorobenzene were detected in the EB. No qualification was required due to analytes esociated sample, or detected at concentrations significantly greater than the EB detections. Its Spike/Matrix Spike Duplicate (MS/MSD)	⊠ ⊠ either n	ot det	ected in NA					
a) b) Co <u>Bei</u> ass Matri a) b) Co	Were blanks (trip, equipment, method) performed at required frequency? Were analytes detected in any blanks? Imments: Equipment blank for BSA-MW-1S was submitted with SDG KPS201. Inzene and chlorobenzene were detected in the EB. No qualification was required due to analytes esociated sample, or detected at concentrations significantly greater than the EB detections. It Spike/Matrix Spike Duplicate (MS/MSD) Was MS/MSD accuracy criteria met?	either n YES	ot det	ected in NA					
a) b) Co <u>Bei</u> ass Matri a) b) Co <u>Da</u>	Were blanks (trip, equipment, method) performed at required frequency? Were analytes detected in any blanks? mments: Equipment blank for BSA-MW-1S was submitted with SDG KPS201. Inzene and chlorobenzene were detected in the EB. No qualification was required due to analytes esociated sample, or detected at concentrations significantly greater than the EB detections. ix Spike/Matrix Spike Duplicate (MS/MSD) Was MS/MSD accuracy criteria met? Was MS/MSD precision criteria met? Was MS/MSD precision criteria met? Intercent is Nitrogen exceeded the recovery criteria low for MS and MSD of sample BSA-MW-1S ass	either n YES	ot det	ected in NA					
a) b) Co <u>Bei</u> ass Matri a) b) Co <u>Da</u>	Were blanks (trip, equipment, method) performed at required frequency? Were analytes detected in any blanks? Imments: Equipment blank for BSA-MW-1S was submitted with SDG KPS201. Inzene and chlorobenzene were detected in the EB. No qualification was required due to analytes esociated sample, or detected at concentrations significantly greater than the EB detections. It Spike/Matrix Spike Duplicate (MS/MSD) Was MS/MSD accuracy criteria met? Was MS/MSD precision criteria met? Was MS/MSD precision criteria met?	either n YES	ot det						



February 2018 3 140-334
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Surrogate (System Monitoring) Compounds				
a)	Surrogate compounds analyzed at the appropriate frequency and met appropriate standards?	$\boxtimes$		
Comments: None.				
Dupli	cates	YES	NO	NA
a)	Were field duplicates collected?	$\boxtimes$		
b)	Was field duplicate precision criteria met?	$\boxtimes$		

Comments: None.

# Additional Comments: None.

#### **Qualifications:**

Quality Control Issue	Compound(s)	Qualifier	Samples Affected
Compounds analyzed at a dilution	Benzene, Chlorobenzene, 1,4-Dichlorobenzene, Chloride, and Sulfate	D	BSA-MW-1S, CPA-MW-2D, CPA-MW-2D-AD
Analyzed outside of hold time	Alkalinity and Carbon Dioxide, Free	J	CPA-MW-2D, BSA-MW-1S
Analyzed outside of hold time; MS/MSD %Rec outside QC limits; compound not detected	Nitrate	IJ	BSA-MW-1S
CCAL %D outside QC limits	Methane	J	CPA-MW-2D, BSA-MW-1S



#### SDG KPS201

Sample Results from:

CPA-MW-2D CPA-MW-2D-AD BSA-MW-1S BSA-MW-1S-EB



## THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc. **TestAmerica Savannah** 5102 LaRoche Avenue Savannah, GA 31404 Tel: (912)354-7858

TestAmerica Job ID: 680-146571-1 TestAmerica Sample Delivery Group: KPS201 Client Project/Site: 4Q17 LTM GW Sampling - 1403345 Revision: 2

For: Solutia Inc. 575 Maryville Centre Dr. Saint Louis, Missouri 63141

Attn: Mr. Jerry Rinaldi

Michule R.Knsey

..... Links

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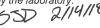
Authorized for release by: 2/15/2018 3:13:38 PM

Michele Kersey, Project Manager II (912)354-7858 michele.kersey@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory. 55D 2//4//8



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Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

#### TestAmerica Job ID: 680-146571-1 SDG: KPS201

#### Job ID: 680-146571-1

#### Laboratory: TestAmerica Savannah

Narrative

## CASE NARRATIVE

## **Client: Solutia Inc.**

## Project: 4Q17 LTM GW Sampling - 1403345

## Report Number: 680-146571-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

#### RECEIPT

The samples were received on 12/08/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.7° C, 4.1° C and 4.5° C.

Report revised 2/12/18 to correct sample IDs.

Report revised 2/15/18 to correct Case Narrative comments.

#### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples CPA-MW-2D-1217 (680-146571-1), CPA-MW-2D-1217-AD (680-146571-3), BSA-MW-1S-1217 (680-146571-4), BSA-MW-1S-1217-EB (680-146571-6) and 4Q17 Trip Blank #4 (680-146571-7) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 12/13/2017 and 12/14/2017.

Samples CPA-MW-2D-1217 (680-146571-1)[250X], CPA-MW-2D-1217-AD (680-146571-3)[250X] and BSA-MW-1S-1217 (680-146571-4) [5000X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 680-506309.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **DISSOLVED GASES**

Samples CPA-MW-2D-1217 (680-146571-1) and BSA-MW-1S-1217 (680-146571-4) were analyzed for dissolved gases in accordance with RSK-175. The samples were analyzed on 12/15/2017 and 12/18/2017.

The following volatile samples were analyzed with significant headspace in the sample Container(s): CPA-MW-2D-1217 (680-146571-1) and BSA-MW-1S-1217 (680-146571-4). Significant headspace is defined as a bubble greater than 6 mm in diameter.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### METALS (ICP) - DISSOLVED

Samples CPA-MW-2D-F(0.2)-1217 (680-146571-2) and BSA-MW-1S-F(0.2)-1217 (680-146571-5) were analyzed for Metals (ICP) – Dissolved in accordance with EPA SW-846 Method 6010C. The samples were prepared on 12/12/2017 and analyzed on 12/13/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP)

## Job ID: 680-146571-1 (Continued)

#### Laboratory: TestAmerica Savannah (Continued)

Samples CPA-MW-2D-1217 (680-146571-1) and BSA-MW-1S-1217 (680-146571-4) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 12/12/2017 and analyzed on 12/13/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### ALKALINITY

Samples CPA-MW-2D-1217 (680-146571-1) and BSA-MW-1S-1217 (680-146571-4) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 12/26/2017.

Due to a significant instrument issue, the following samples were analyzed outside of hold time: CPA-MW-2D-1217 (680-146571-1) and BSA-MW-1S-1217 (680-146571-4). The samples were diverted to TA Cedar Falls for analysis to minimize the hold time exceedance.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **CHLORIDE**

Samples CPA-MW-2D-1217 (680-146571-1) and BSA-MW-1S-1217 (680-146571-4) were analyzed for Chloride in accordance with EPA Method 325.2. The samples were analyzed on 12/18/2017 and 12/19/2017.

Sample BSA-MW-1S-1217 (680-146571-4)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### NITRATE-NITRITE AS NITROGEN

Samples CPA-MW-2D-1217 (680-146571-1) and BSA-MW-1S-1217 (680-146571-4) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 12/08/2017.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 680-505753 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### SULFATE

Samples CPA-MW-2D-1217 (680-146571-1) and BSA-MW-1S-1217 (680-146571-4) were analyzed for sulfate in accordance with EPA Method 375.4. The samples were analyzed on 12/18/2017.

Samples CPA-MW-2D-1217 (680-146571-1)[5X] and BSA-MW-1S-1217 (680-146571-4)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### TOTAL ORGANIC CARBON

Samples CPA-MW-2D-1217 (680-146571-1) and BSA-MW-1S-1217 (680-146571-4) were analyzed for total organic carbon in accordance with EPA Method 415.1. The samples were analyzed on 12/14/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **DISSOLVED ORGANIC CARBON (DOC)**

Samples CPA-MW-2D-F(0.2)-1217 (680-146571-2) and BSA-MW-1S-F(0.2)-1217 (680-146571-5) were analyzed for Dissolved Organic Carbon (DOC) in accordance with EPA Method 415.1. The samples were analyzed on 12/14/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### FREE CARBON DIOXIDE

Samples CPA-MW-2D-1217 (680-146571-1) and BSA-MW-1S-1217 (680-146571-4) were analyzed for free carbon dioxide in accordance with SM 4500 CO2 C. The samples were analyzed on 12/26/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Sample Summary

## Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job ID: 680-146571-1 SDG: KPS201

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-146571-1	CPA-MW-2D-1217	Water	12/07/17 09:05	12/08/17 09:40
680-146571-2	CPA-MW-2D-F(0.2)-1217	Water	12/07/17 09:05	12/08/17 09:40
680-146571-3	CPA-MW-2D-1217-AD	Water	12/07/17 09:05	12/08/17 09:40
680-146571-4	BSA-MW-1S-1217	Water	12/07/17 10:05	12/08/17 09:40
680-146571-5	BSA-MW-1S-F(0.2)-1217	Water	12/07/17 10:05	12/08/17 09:40
680-146571-6	BSA-MW-1S-1217-EB	Water	12/07/17 10:30	12/08/17 09:40
680-146571-7	4Q17 Trip Blank #4	Water	12/07/17 00:00	12/08/17 09:40

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55D 2/14/18 TestAmerica Savannah

## **Method Summary**

## Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

lethod	Method Description	Protocol	Laboratory
260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
RSK-175	Dissolved Gases (GC)	RSK	TAL SAV
010C	Metals (ICP)	SW846	TAL SAV
25.2-1978	Chloride	MCAVW	TAL SAV
53.2-1993 R2.0	Nitrogen, Nitrate-Nitrite	MCAVW	TAL SAV
75.4-1978	Sulfate	MCAWW	TAL SAV
15.1-1974	TOC	MCAWW	TAL SAV
15.1-1974	DOC	MCAWW	TAL SAV
SM 2320B	Alkalinity	SM	TAL CF
SM 4500 CO2 C	Free Carbon Dioxide	SM	TAL CF

#### **Protocol References:**

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

## **Definitions/Glossary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

## Qualifiers

quannore	
GC/MS VOA	A
Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
GC VOA	
Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
Metals	
Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
General Ch	emistry
Qualifier	Qualifier Description
HÊ	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
Н	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.
F1	MS and/or MSD Recovery is outside acceptance limits.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

SSD 2/14/18 TestAmerica Savannah

TestAmerica Job ID: 680-146571-1 SDG: KPS201

Lab Sample ID: 680-146571-1

## Client Sample ID: CPA-MW-2D-1217

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Chlorobenzene	22000	P	250		ug/L	250		8260B	Total/NA
1,4-Dichlorobenzene	700	D	250		ug/L	250		8260B	Total/NA
Methane (TCD)	990	J	390		ug/L	1		RSK-175	Total/NA
Iron	7,7		0.050		mg/L	=1		6010C	Total
Manganese	0.45		0.010		mg/L	1		6010C	Recoverable Total Recoverable
Chloride	49		1.0		mg/L	1		325.2-1978	Total/NA
Sulfate	47	D	25		mg/L	5		375.4-1978	Total/NA
Total Organic Carbon	5.9		1.0		mg/L	1		415.1-1974	Total/NA
Alkalinity as CaCO3	480	x z	5.0		mg/L	1		SM 2320B	Total/NA
Carbon Dioxide, Free	67	ht 5	5.0		mg/L	1		SM 4500 CO2 C	Total/NA

## Client Sample ID: CPA-MW-2D-F(0.2)-1217

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron, Dissolved	7.6		0.050	5	mg/L	1	_	6010C	Dissolved
Manganese, Dissolved	0.45		0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	5.8		1.0		mg/L	1		415.1-1974	Dissolved

## Client Sample ID: CPA-MW-2D-1217-AD

Analyte	Result	Qualifier	RL	MDL Unit	Dil Fac D	Method	Ргер Туре
Chlorobenzene	22000	P	250	ug/L	250	8260B	Total/NA
1,4-Dichlorobenzene	730	$\mathcal{P}$	250	ug/L	250	8260B	Total/NA

## Client Sample ID: BSA-MW-1S-1217

## Lab Sample ID: 680-146571-4

Lab Sample ID: 680-146571-5

Lab Sample ID: 680-146571-6

Lab Sample ID: 680-146571-2

Lab Sample ID: 680-146571-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method -	Ргер Туре
Benzene	430000	D	5000		ug/L	5000		8260B	Total/NA
Methane (TCD)	3600	2	390		ug/L	1		RSK-175	Total/NA
Iron	25		0.050		mg/L	1		6010C	Total
Manganese	2.2		0.010		mg/L	1		6010C	Recoverable Total
						·		00100	Recoverable
Chloride	370	$\mathcal{P}$	10		mg/L	10		325.2-1978	Total/NA
Sulfate	66 🕽	2	10		mg/L	2		375.4-1978	Total/NA
Total Organic Carbon	12		1.0		mg/L	1		415.1-1974	Total/NA
Alkalinity as CaCO3	1200	K 3	5.0		mg/L	1		SM 2320B	Total/NA
Carbon Dioxide, Free	440	hf J	5.0		mg/L	1		SM 4500 CO2 C	Total/NA

## Client Sample ID: BSA-MW-1S-F(0.2)-1217

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Ргер Туре
Iron, Dissolved	26	0.050		mg/L	1		6010C	Dissolved
Manganese, Dissolved	2.3	0.010		mg/L	1		6010C	Dissolved
Dissolved Organic Carbon	12	1.0		mg/L	1		415.1-1974	Dissolved

## Client Sample ID: BSA-MW-1S-1217-EB

This Detection Summary does not include radiochemical test results.



## **Detection Summary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345 TestAmerica Job ID: 680-146571-1 SDG: KPS201

Client Sample ID: BSA-MW-1S-1217-EB (Continued) Lab Sample ID: 680-146						
Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
Benzene	39	1.0	ug/L	1	8260B	Total/NA
Chlorobenzene	1.0	1.0	ug/L	1	8260B	Total/NA
Client Sample ID: 4G	17 Trip Blank #4			Lab San	nple ID: 6	80-146571-7

## Client Sample ID: 4Q17 Trip Blank #4

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Job ID: 680-146571-1 SDG: KPS201

## Client Sample ID: CPA-MW-2D-1217

Date Collected: 12/07/17 09:05 Date Received: 12/08/17 09:40

## Lab Sample ID: 680-146571-1 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	250	U	250		ug/L		<u></u>	12/14/17 03:06	250
Chlorobenzene	22000	D	250		ug/L			12/14/17 03:06	250
1,2-Dichlorobenzene	250	U	250		ug/L			12/14/17 03:06	250
1,3-Dichlorobenzene	250	U	250		ug/L			12/14/17 03:06	250
1,4-Dichlorobenzene	700	D	250		ug/L			12/14/17 03:06	250
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		80 - 120					12/14/17 03:06	250
1,2-Dichloroethane-d4 (Surr)	100		73 <i>-</i> 131					12/14/17 03:06	250
Dibromofluoromethane (Surr)	104		80 - 122					12/14/17 03:06	250
4-Bromofluorobenzene (Surr)	89		80 - 120					12/14/17 03:06	250
Method: RSK-175 - Dissolve	d Gases (GC)	)							
Analyte	• •	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			12/15/17 15:05	1
Ethylene	1.0	U	1.0		ug/L			12/15/17 15:05	1
Methane (TCD)	990	2	390		ug/L			12/18/17 16:57	1
Method: 6010C - Metals (ICF	P) - Total Reco	overable							
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	7.7		0.050		mg/L		12/12/17 10:44	12/13/17 05:49	1
Manganese	0.45		0.010		mg/L		12/12/17 10:44	12/13/17 05:49	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	49		1.0		mg/L			12/18/17 14:16	1
Nitrate as N	0.050	U	0.050		mg/L			12/08/17 16:59	1
Sulfate	47	D	25		mg/L			12/18/17 15:44	5
Total Organic Carbon	5.9		1.0		mg/L			12/14/17 12:22	× 1
Total Organic Carbon	•••								
Alkalinity as CaCO3	480	HF J	5.0		mg/L			12/26/17 19:08	1

4 5 7 8 9 10 11 12 13

Client: Solutia Inc.

Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica Job	DID: 680-146571-1
	SDG: KPS201

Client Sample ID: CPA-MW-2D-F(0.2)-1217 Date Collected: 12/07/17 09:05 Date Received: 12/08/17 09:40					La	ID: 680-146 Matrix:	46571-2 rix: Water		
Method: 6010C - Metals (ICF Analyte	P) - Dissolved Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	7.6		0.050		mg/L		12/12/17 10:44	12/13/17 06:10	
Manganese, Dissolved	0.45		0.010		mg/L		12/12/17 10:44	12/13/17 06:10	
General Chemistry - Dissol	ved								
Analyte	Result (	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Dissolved Organic Carbon	5.8		1.0		mg/L			12/14/17 12:42	

530 2/14/18 TestAmerica Savannah

TestAmerica Job ID: 680-146571-1 SDG: KPS201

## Client Sample ID: CPA-MW-2D-1217-AD

Date Collected: 12/07/17 09:05 Date Received: 12/08/17 09:40

## Lab Sample ID: 680-146571-3 Matrix: Water

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	250	U	250		ug/L			12/14/17 05:16	250
Chlorobenzene	22000	$\triangleright$	250		ug/L			12/14/17 05:16	250
1,2-Dichlorobenzene	250	U	250		ug/L			12/14/17 05:16	250
1,3-Dichlorobenzene	250	U	250		ug/L			12/14/17 05:16	250
1,4-Dichlorobenzene	730	P	250		ug/L			12/14/17 05:16	250
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		80 - 120			-		12/14/17 05:16	250
1,2-Dichloroethane-d4 (Surr)	99		73 <sub>-</sub> 131					12/14/17 05:16	250
Dibromofluoromethane (Surr)	103		80 - 122					12/14/17 05:16	250
4-Bromofluorobenzene (Surr)	90		80 - 120					12/14/17 05:16	250

10 11 12 13

500 2/14/18 **TestAmerica Savannah** 

TestAmerica Job ID: 680-146571-1 SDG: KPS201

#### Client Sample ID: BSA-MW-1S-1217 Date Collected: 12/07/17 10:05

Date Received: 12/08/17 09:40

## Lab Sample ID: 680-146571-4 Matrix: Water

Analyte	Result	Qualifier	, RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	430000	$\overline{\mathcal{D}}$	5000		ug/L			12/14/17 02:23	5000
Chlorobenzene	5000	ບໍ່	5000		ug/L			12/14/17 02:23	5000
1,2-Dichlorobenzene	5000	U	5000		ug/L			12/14/17 02:23	5000
1,3-Dichlorobenzene	5000	U	5000		ug/L			12/14/17 02:23	5000
1,4-Dichlorobenzene	5000	U	5000		ug/L			12/14/17 02:23	5000
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		80 - 120					12/14/17 02:23	5000
1,2-Dichloroethane-d4 (Surr)	97		73 - 131					12/14/17 02:23	5000
Dibromofluoromethane (Surr)	109		80 - 122					12/14/17 02:23	5000
4-Bromofluorobenzene (Surr)	90		80 - 120					12/14/17 02:23	5000
Method: RSK-175 - Dissolved	Gases (GC)	<b>`</b>							
Analyte		/ Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethane	1.1	U	1.1		ug/L			12/18/17 17:10	1
Ethylene	1.0	U	1.0		ug/L			12/18/17 17:10	1
Methane (TCD)	3600	5	390		ug/L			12/18/17 17:10	1
Method: 6010C - Metals (ICP) ·	Total Reco	overable							
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	25		0.050		mg/L		12/12/17 10:44	12/13/17 06:05	1
Manganese	2.2		0.010		mg/L		12/12/17 10:44	12/13/17 06:05	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	370	$\overline{\mathcal{P}}$	10		mg/L			12/19/17 07:43	10
Nitrate as N	0.050	UFIJ	0.050		mg/L			12/08/17 16:52	1
Sulfate	66	P	10		mg/L			12/18/17 16:11	2
Total Organic Carbon	12		1.0		mg/L			12/14/17 12:58	1
Alkalinity as CaCO3	1200	KJ	5.0		mg/L			12/26/17 19:08	1
	1200	· · · ·							

50D 2/14/18 **TestAmerica Savannah** 

Client: Solutia Inc.

Project/Site: 4Q17 LTM GW Sampling - 1403345

TestAmerica	Job	ID:	680-146571-1
			SDG: KPS201

#### Client Sample ID: BSA-MW-1S-F(0.2)-1217 Lab Sample ID: 680-146571-5 Date Collected: 12/07/17 10:05 Matrix: Water Date Received: 12/08/17 09:40 Method: 6010C - Metals (ICP) - Dissolved **Result Qualifier** Analyte RL MDL Unit D Prepared Analyzed **Dil Fac** Iron, Dissolved 26 0.050 mg/L 12/12/17 10:44 12/13/17 06:15 1 Manganese, Dissolved 2.3 0.010 mg/L 12/12/17 10:44 12/13/17 06:15 1 **General Chemistry - Dissolved** RL Analyte **Result Qualifier MDL** Unit D Prepared Analyzed **Dil Fac Dissolved Organic Carbon** 1.0 12/14/17 13:15 12 mg/L

1

500 2/14/18 TestAmerica Savannah

TestAmerica Job ID: 680-146571-1 SDG: KPS201

# Client Sample ID: BSA-MW-1S-1217-EB Lab Sample ID: 680-146571-6 Date Collected: 12/07/17 10:30 Matrix: Water Date Received: 12/08/17 09:40 Method: 8260B Velatile Organic Compounds (CC(MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	39		1.0		ug/L			12/13/17 15:48	1
Chlorobenzene	1.0		1.0		ug/L			12/13/17 15:48	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 15:48	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 15:48	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 15:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	101		80 - 120			-		12/13/17 15:48	1
1,2-Dichloroethane-d4 (Surr)	98		73_131					12/13/17 15:48	1
Dibromofluoromethane (Surr)	109		80 - 122					12/13/17 15:48	1
4-Bromofluorobenzene (Surr)	102		80 - 120					12/13/17 15:48	1

500 2/14/18

TestAmerica Savannah

TestAmerica Job ID: 680-146571-1 SDG: KPS201

## Client Sample ID: 4Q17 Trip Blank #4 Date Collected: 12/07/17 00:00 Date Received: 12/08/17 09:40

## Lab Sample ID: 680-146571-7 Matrix: Water

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	, RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ug/L			12/13/17 16:11	1
Chlorobenzene	1.0	U	1.0		ug/L			12/13/17 16:11	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 16:11	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 16:11	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 16:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	103		80 - 120					12/13/17 16:11	1
1,2-Dichloroethane-d4 (Surr)	96		73 - 131					12/13/17 16:11	1
Dibromofluoromethane (Surr)	108		80 - 122					12/13/17 16:11	1
4-Bromofluorobenzene (Surr)	102		80 - 120					12/13/17 16:11	1

SJD 2/14/18 TestAmerica Savannah

### Method: 8260B - Volatile Organic Compounds (GC/MS) Matrix: Water

latrix: Water						Prep Type: Total/N/						
			Percent Surrogate Recovery (Acceptance Limits)									
		TOL	DCA	DBFM	BFB							
Lab Sample ID	Client Sample ID	(80-120)	(73-131)	(80-122)	(80-120)							
580-146571-1	CPA-MW-2D-1217	96	100	104	89							
680-146571-3	CPA-MW-2D-1217-AD	96	99	103	90							
680-146571-4	BSA-MW-1S-1217	97	97	109	90							
680-146571-6	BSA-MW-1S-1217-EB	101	98	109	102							
680-146571-7	4Q17 Trip Blank #4	103	96	108	102							
LCS 680-506230/3	Lab Control Sample	99	100	97	101							
LCS 680-506309/3	Lab Control Sample	96	93	96	92							
LCSD 680-506230/4	Lab Control Sample Dup	103	102	102	102							
LCSD 680-506309/4	Lab Control Sample Dup	96	92	94	93							
MB 680-506230/8	Method Blank	100	97	106	101							
MB 680-506309/9	Method Blank	95	93	100	91							

Surrogate Legend TOL = Toluene-d8 (Surr)

DCA = 1,2-Dichloroethane-d4 (Surr)

DBFM = Dibromofluoromethane (Surr)

BFB = 4-Bromofluorobenzene (Surr)

SBD 2/H//8 TestAmerica Savannah

**Client Sample ID: Method Blank** 

Prepared

Prep Type: Total/NA

Analyzed 12/13/17 14:48 12/13/17 14:48

12/13/17 14:48

12/13/17 14:48

Prep Type: Total/NA

**Client Sample ID: Lab Control Sample** 

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-506230/8
Matrix: Water
Analysis Batch: 506230

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	<u> </u>	1.0		ug/L			12/13/17 14:48	1
Chlorobenzene	1.0	U	1.0		ug/L			12/13/17 14:48	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 14:48	1
1,3-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 14:48	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			12/13/17 14:48	1

	MB	MB	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	100		80 - 120
1,2-Dichloroethane-d4 (Surr)	97		73 - 131
Dibromofluoromethane (Surr)	106		80 - 122
4-Bromofluorobenzene (Surr)	101		80 - 120

#### Lab Sample ID: LCS 680-506230/3 Matrix: Water Analysis Batch: 506230

	Spike	LCS	LCS			%Rec	%Rec.	
Analyte	Added	Result	Qualifier	Unit	D		Limits	
Benzene	50.0	49.7		ug/L		99	80 - 120	
Chlorobenzene	50.0	49.6		ug/L		99	80 - 120	
1,2-Dichlorobenzene	50.0	48.9		ug/L		98	80 - 120	
1,3-Dichlorobenzene	50.0	49.2		ug/L		98	80 - 120	
1,4-Dichlorobenzene	50.0	49.3		ug/L		99	80 - 120	

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	99		80 - 120
1,2-Dichloroethane-d4 (Surr)	100		73 - 131
Dibromofluoromethane (Surr)	97		80 - 122
4-Bromofluorobenzene (Surr)	101		80 - 120

#### Lab Sample ID: LCSD 680-506230/4 Matrix: Water Analysis Batch: 506230

Analysis Daton. Juuzju									
_	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	50.0	51.6		ug/L		103	80 - 120	4	20
Chlorobenzene	50.0	50.0		ug/L		100	80 - 120	1	20
1,2-Dichlorobenzene	50.0	49.0		ug/L		98	80 - 120	0	20
1,3-Dichlorobenzene	50.0	49.4		ug/L		99	80 - 120	0	20
1,4-Dichlorobenzene	50.0	49.4		ug/L		99	80 - 120	0	20
1	LCSD LCSD								
	Analyte Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene	AnalyteSpikeAnalyteAddedBenzene50.0Chlorobenzene50.01,2-Dichlorobenzene50.01,3-Dichlorobenzene50.0	AnalyteSpikeLCSDAnalyteAddedResultBenzene50.051.6Chlorobenzene50.050.01,2-Dichlorobenzene50.049.01,3-Dichlorobenzene50.049.41,4-Dichlorobenzene50.049.4	AnalyteSpikeLCSDLCSDAnalyteAddedResultQualifierBenzene50.051.60Chlorobenzene50.050.011,2-Dichlorobenzene50.049.011,3-Dichlorobenzene50.049.411,4-Dichlorobenzene50.049.41	AnalyteSpikeLCSDLCSDAnalyteAddedResultQualifierUnitBenzene50.051.6ug/LChlorobenzene50.050.0ug/L1,2-Dichlorobenzene50.049.0ug/L1,3-Dichlorobenzene50.049.4ug/L1,4-Dichlorobenzene50.049.4ug/L	AnalyteSpikeLCSDLCSDAnalyteAddedResultQualifierUnitDBenzene50.051.6ug/Lug/LChlorobenzene50.050.0ug/L1,2-Dichlorobenzene50.049.0ug/L1,3-Dichlorobenzene50.049.4ug/L1,4-Dichlorobenzene50.049.4ug/L	Spike         LCSD         LCSD           Analyte         Added         Result         Qualifier         Unit         D         %Rec           Benzene         50.0         51.6         ug/L         103           Chlorobenzene         50.0         50.0         ug/L         100           1,2-Dichlorobenzene         50.0         49.0         ug/L         98           1,3-Dichlorobenzene         50.0         49.4         ug/L         99           1,4-Dichlorobenzene         50.0         49.4         ug/L         99	Spike         LCSD         LCSD         %Rec.           Analyte         Added         Result         Qualifier         Unit         D         %Rec.         Limits           Benzene         50.0         51.6         ug/L         103         80 - 120           Chlorobenzene         50.0         50.0         ug/L         100         80 - 120           1,2-Dichlorobenzene         50.0         49.0         ug/L         98         80 - 120           1,3-Dichlorobenzene         50.0         49.4         ug/L         99         80 - 120           1,4-Dichlorobenzene         50.0         49.4         ug/L         99         80 - 120	Spike         LCSD         LCSD         Mail         Mail <t< td=""></t<>

	2005	2005	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	103		80 - 120
1,2-Dichloroethane-d4 (Surr)	102		73 - 131
Dibromofluoromethane (Surr)	102		80 - 122
4-Bromofluorobenzene (Surr)	102		80 - 120

#### Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

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Dil Fac

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## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-506 Matrix: Water	309/9							Clie	ent Sam	ple ID: Method Prep Type: To	
Analysis Batch: 506309	MB	МВ									
Analyte		Qualifier	RL	ſ	NDL L	Jnit	D	) P	repared	Analyzed	Dil Fac
Benzene	1.0	U	1.0		ū	ıg/L				12/13/17 22:02	1
Chlorobenzene	1.0	U	1.0		u	ıg/L				12/13/17 22:02	1
1,2-Dichlorobenzene	1.0	U	1.0		u	ıg/L				12/13/17 22:02	1
1,3-Dichlorobenzene	1.0	U	1.0		u	ig/L				12/13/17 22:02	1
1,4-Dichlorobenzene	1.0	U	1.0		u	ıg/L				12/13/17 22:02	1
	MB	MB									
Surrogate	%Recovery	Qualifier	Limits					F	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	95		80 - 120							12/13/17 22:02	1
1,2-Dichloroethane-d4 (Surr)	93		73 - 131							12/13/17 22:02	1
Dibromofluoromethane (Surr)	100		80 - 122							12/13/17 22:02	1
4-Bromofluorobenzene (Surr)	91		80 - 120							12/13/17 22:02	1
Lab Sample ID: LCS 680-50 Matrix: Water Analysis Batch: 506309	6309/3						Clier	nt Sa	mple ID	: Lab Control S Prep Type: To	
,			Spike	LCS	LCS					%Rec.	
Analyte			Added	Result	Qualit	fier	Unit	D	%Rec	Limits	
Benzene			50.0	47.6			ug/L		95	80 - 120	
Chlorobenzene			50.0	50.3			ug/L		101	80 - 120	
1,2-Dichlorobenzene			50.0	48.6			ug/L		97	80 - 120	
							•				

50.0

47.8

48.8

ug/L

ug/L

1,4-Dichlorobenzene			50.0
	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
Toluene-d8 (Surr)	96		80 - 120
1,2-Dichloroethane-d4 (Surr)	93		73 - 131
Dibromofluoromethane (Surr)	96		80 - 122
4-Bromofluorobenzene (Surr)	92		80 - 120

#### Lab Sample ID: LCSD 680-506309/4 Matrix: Water

Analysis Batch: 506309

1,3-Dichlorobenzene

			Spike	LCSD	LCSD				%Rec.		RPD
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene			50.0	47.5		ug/L		95	80 - 120	0	20
Chlorobenzene			50.0	48.9		ug/L		98	80 - 120	3	20
1,2-Dichlorobenzene			50.0	48.8		ug/L		98	80 - 120	0	20
1,3-Dichlorobenzene			50.0	48.2		ug/L		96	80 - 120	1	20
1,4-Dichlorobenzene			50.0	48.7		ug/L		97	80 - 120	0	20
	LCSD	LCSD									
Surrogate	%Recovery	Qualifier	Limits								
Toluene-d8 (Surr)	96		80 - 120								

		00-120
1,2-Dichloroethane-d4 (Surr)	92	73 - 131
Dibromofluoromethane (Surr)	94	80 - 122
4-Bromofluorobenzene (Surr)	93	80 - 120

Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

96

98

80 - 120

80 - 120

50D 2/14/18

TestAmerica Savannah

## **QC Sample Results**

Lab Sample ID: MB 680-506553/12 Matrix: Water Analysis Batch: 506553									C	Clie	nt Sam	ple ID: Me Prep Typ		
Analysis Batch. 000000	MB	МВ												
Analyte		Qualifier		RL		MDL	Unit		D	Pr	epared	Analyz	ed	Dil Fa
Ethane	1.1	-		1.1			ug/L					12/15/17	2:43	
Ethylene	1.0			1.0			ug/L					12/15/17 1	2:43	
Methane	0.58			0.58			ug/L					12/15/17 1		
Methane (TCD)	390	U		390			ug/L					12/15/17	2:43	
Lab Sample ID: LCS 680-506553/6 Matrix: Water								Cli	ent	San	nple ID	: Lab Con Prep Typ		
Analysis Batch: 506553														
			Spike			LCS						%Rec.		
Analyte			Added		Result	Qua	lifier	Unit		D	%Rec	Limits		
Methane (TCD)			1920		1660			ug/L			87	75 <sub>-</sub> 125		
Lab Sample ID: LCS 680-506553/9 Matrix: Water								Cli	ient :	San	nple ID	: Lab Con Prep Typ		
Analysis Batch: 506553														
Ameluán			Spike			LCS		11		-		%Rec.		
Analyte			Added		Result	Qua	litier	Unit		D	%Rec	Limits		
Ethylene			288 269		264 251			ug/L ug/L			91 93	75 - 125 75 - 125		
Lab Sample ID: LCSD 680-506553/1 Matrix: Water	0						C	lient S	Samı	ole	ID: Lab	Control S Prep Typ		
Analysis Batch: 506553														
•			Spike		LCSD	LCS	D					%Rec.		RP
Analyte			Added		Result	Qua	lifier	Unit		D	%Rec	Limits	RPD	Lim
Ethane			288		254			ug/L		_	88	75 - 125	4	3
Ethylene			269		237			ug/L			88	75 - 125	6	3
Lab Sample ID: LCSD 680-506553/7 Matrix: Water	,						C	lient S	Samj	ole	ID: Lab	Control S Prep Typ		
Analysis Batch: 506553							_							
Amelia			Spike		LCSD	-	-			_	~	%Rec.		RP
Analyte			Added		Result	Qua	litier	Unit		D	%Rec	Limits	RPD	
Methane (TCD)			1920		1700			ug/L			88	75 - 125	2	3
Lab Sample ID: MB 680-506635/42 Matrix: Water Analysis Batch: 506635									(	Clie	nt Sam	ple ID: Me Prep Typ		
	MB	MB												
Analyte	Result	Qualifier		RL		MDL	Unit		D	Pi	repared	Analyz	ed	Dil Fa
Ethane	1.1	U		1.1			ug/L					12/14/17	18:10	
Ethylene	1.0	U		1.0			ug/L					12/14/17	18:10	
Methane	0.58	U		0.58			ug/L					12/14/17	18:10	
Methane (TCD)	390	- 2 A		390			ug/L					12/14/17		

53D 2/14/18 TestAmerica Savannah

Matrix: Water Analyse Batch: 506635         Prep Type: Total/N Analyse Batch: 506635         Prep Type: Total/N Analyse Matrix: Water Analyse Batch: 506635         Prep Type: Total/N Analyse Batch: 506635         Prep Type: Total/N Analyse Batch: 506635           Lab Sample ID: LCS 680-506635/39 Matrix: Water Analyse Envine         Spike         LCS 268	Lab Sample ID: LCS 680-506635/37							Clie	ent Sa	mple ID	: Lab Con	trol Sa	mol
Analysis Batch: 506635 Analyte Added Added Result Qualifier Unit D %Rec. Limits 75.125 Analyte Added Result Qualifier Unit D %Rec. Limits 75.125 Client Sample ID: LCS 680-506635/39 Matrix: Water Analysis Batch: 506635 Analyte Added Result Qualifier Unit D %Rec. Limits End Control Sample D: LCS D680-506635/40 Matrix: Water Analysis Batch: 506635 Analyte Added Result Qualifier Unit D %Rec. Rec. End Control Sample D: LCS D680-506635/40 Matrix: Water Analysis Batch: 506635 Analyte Added Result Qualifier Unit D %Rec. Rec. Ref Limits RPD Rec Result Qualifier Unit D %Rec Result Qualifier Unit D %Rec Result Qualifier Unit C Unit RPD Rec Result Qualifier Unit	Matrix: Water							• III	one ou	inpic ib			
Analyte Methane (TCD)         Added 1920         Result Result (usifier ug/L         D b (usifier ug/L         M b b b b b b b b b b b b b b b b b b b	Analysis Batch: 506635												
Methane (TCD)         1920				Spike	1	LCS	LCS				%Rec.		
Lab Sample ID: LCS 680-506635/39       Client Sample ID: Lab Control Samp         Analysis Batch: 506635       Spike       Result Qualifier       Unit       D       %Rec.         Emine       266       248       ug/L       D       %Rec.       Limits         Emine       269       248       ug/L       D       %Rec.       Limits         Emine       269       248       ug/L       D       %Rec.       Limits         Lab Sample ID: LCSD 680-506635/38       Spike       CISD LCSD       CSD LCSD       %Rec.       Rep         Analysis Batch: 506635       Spike       Added       Result       Qualifier       Unit       D       %Rec.       RPD       Lin         Methane (TOD)       1920       1920       TS 125       6       Linits       RPD       Lin         Matrix: Water       Analysis Batch: 506635       Spike       LCSD LCSD       %Kec.       Rec.       Rec.       Rec.         Analysis Batch: 506630       MB       MB       Added       Result       Qualifier       Unit       D       %Rec.       Rec.       Rec.         Analysis Batch: 506830       MB       MB       Added       MDL       Unit       D       Prep Type: Total/N	Analyte			Added	Re	sult	Qualifier	Unit	D	%Rec	Limits		
Matrix: Water Analysis Batch: 506635         Spike Added         LCS	Methane (TCD)			1920	1	630		ug/L		85	75 - 125		
Matrix: Water Analysis Batch: 506635         Spike Added         LCS	Lab Sample ID: I CS 680-506635/39							Clie	ent Sa	mnie ID	· Lah Con	trol Sa	mpl
Analysis Batch: 506635         Spike         LCS         LCS         VRec.           Analyte         288         265         ug/L         92         75.125           Ethylene         269         248         ug/L         92         75.125           Lab Sample ID: LCSD 680-506635/38         Spike         CIlent Sample ID: Lab         Control Sample D: Prep Type: Total/N           Analyte         Added         Added         Result         Qualifier         Unit         D         %Rec.         RF           Analyte         Added         1920         1000         Ug/L         0         %Rec.         RF           Ethylene         269         234         Ug/L         87         75.125         6           Lab Sample ID: MB 680-506630/10         Katrix: Water         Analyte         NB         MB         NA         12/18/17/15.52         12/18/17/15								011		inpic ib			
Spike         LCS         LCS         UCS         Unit         D         %Rec.         Kec.           Ethane         285         285         ug/L         92         75.125         25           Ethylene         269         248         ug/L         92         75.125           Lab Sample ID: LCSD 680-506635/38         Spike         CEIent Sample ID: LAB         Celent Sample ID: LAB         Sector 10 Sample D.           Analyte         Added         Result         Qualifier         Unit         D         %Rec.         Ref.         RPD         Lin           Matrix: Water         Added         Result         Qualifier         Unit         D         %Rec.         Ref.         RPD         Lin           Analyte         Added         Result         Qualifier         Unit         D         %Rec.         Ref.         RPD         Lin           Analyte         Added         Result         Qualifier         Unit         D         %Rec.         Ref.         RPD         Lin           Analyte         Added         Result         Qualifier         Unit         D         %Rec.         Ref.         RPD         Lin         Ref.         RPD         Lin         Lin <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1100 131</td><td></td><td></td></t<>											1100 131		
Effanie         288         285         ug/L         92         75-125           Ethylene         269         248         ug/L         92         75-125           Lab Sample ID: LCSD 680-506635/38         Matrix: Water         Analysis Batch: 506635         Prep Type: Total/N           Analysis Batch: 506635         Spike         LCSD         LCSD         Matrix: Water           Analysis Batch: 506635         Added         Result         Qualifier         Multifier         M				Spike	1	LCS	LCS				%Rec.		
Efflylene         269         248         ug/L         92         75.125           Lab Sample ID: LCSD 680-506635/38 Matrix: Water Analysis Batch: 506635         Spike         LCSD         Client Sample ID: Lab Control Sample Du Prep Type: Total/N Analysis Batch: 506635         Spike         LCSD         LCSD         Were.         Re           Methane (TCD)         1920         100         ug/L         0         %Rec.         RF           Lab Sample ID: LCSD 680-506635/40 Matrix: Water Analysis Batch: 506635         Spike         LCSD         LCSD         LCSD         LCSD         LSD         Client Sample ID: Lab Control Sample DU Prep Type: Total/N Analysis Batch: 506635           Anayte         Added         Result Qualifier         Unit         D         %Rec.         RF           Ethylene         289         234         ug/L         67         75.125         6           Lab Sample ID: MB 680-506830/10 Matrix: Water Analysis Batch: 506830         MB         RP         Limits         RPD         Lin           Analyte         1.0         1.1         ug/L         0         Prep ared         Analyzed         DI F           Ethylene         1.0         1.0         ug/L         12/18/17 15.52         DI F           Ethylene         1.0         0	Analyte			Added	Re	sult	Qualifier	Unit	D	%Rec	Limits		
Lab Sample ID: LCSD 680-506635/38       Client Sample ID: Lab Control Sample Dt         Matrix: Water       Analyte       Client Sample ID: Lab Control Sample Dt         Analyte       Added       Result Qualifier       Unit       D       %Rec.       RR         Analyte       Added       1920       1600       Ug/L       D       %Rec.       RR         Lab Sample ID: LCSD 680-506635/40       Matrix: Water       Analyte       Client Sample ID: Lab Control Sample Dt       Prep Type: Total/N         Analyte       Added       1920       1600       Ug/L       D       %Rec.       RR         Analyte       Added       Spike       LCSD       LCSD       Kesuit       Qualifier       Ug/L       D       %Rec.       RR         Analyte       Added       Added       Result       Qualifier       Ug/L       B       %Rec.       RR         Lab Sample ID: MB 680-506830/10       Matrix: Water       Analyte       Result       Qualifier       R       MDL       Unit       D       %Rec.       RR       Hints       RPD       Lin         Ethane       1.1       U       1.1       Ug/L       12/16/17 15:52       Client Sample ID: MB 680-506830/3       Matrix: Water       Matrix: Water       Matr	Ethane			288		265		ug/L		92	75 - 125		
Matrix: Water Analysis Batch: 506635         Spike Added         LCSD         LCSD         LCSD         Mail	Ethylene			269		248				92	75 - 125		
Matrix: Water Analysis Batch: 506635         Spike Added         LCSD         LCSD         LCSD         Mail	Lab Sample ID: LCSD 680-506635/3	8					c	lient S	ample	ID: Lab	Control	Sample	e Du
Analysis Batch: 506635       Spike Added       LCSD Result       LCSD Qualifier       LCSD Ug/L       P %Rec 83       KRec Limits       RPD RPD RPD RPD       Limits RPD         Analyte       1920       1600       Unit       D       %Rec 83       RPD       Limits       RPD       Limits       RPD       Linits       RPD <td< td=""><td>Matrix: Water</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>•</td><td></td><td></td><td></td><td></td></td<>	Matrix: Water								•				
AnalyteAddedResultQualifierUnitD%RecLimitsRPDLinMethane (TCD)1920160016000008375-12521Lab Sample ID: LCSD 680-506635/40 Matrix: WaterClient Sample ID: Lab Control Sample D Prep Type: Total/NAnalyteAddedSpike 269LCSDLCSDVV%Rec.RiAnalyteAddedResultQualifierUnitD%Rec.RiRPDLinClient Sample ID: MB 680-506830/10 Matrix: WaterMBMBNBClient Sample ID: Method Blar Prep Type: Total/NAnalyteResultQualifier1.1U1.1ug/LDPreparedAnalyzed 12/18/17 15:52Dil FEthane1.1 <u< td="">1.1ug/L1.0ug/L12/18/17 15:522Dil FEthane0.58<u< td="">0.58<uul><li>ug/L</li><li>12/18/17 15:52</li><li>Lab Sample ID: LCS 680-506830/3 Matrix: WaterSpikeLCSLCSLCSClient Sample ID: Lab Control Sample Prep Type: Total/NAnalyte0.58<u< td="">0.58<uul><li>ug/L</li><li>12/18/17 15:52</li><li>Lab Sample ID: LCS 680-506830/3 Matrix: WaterSpikeLCSLCSLCSMesAnalyteAddedResultQualifierUnitD%Rec.Jili FAnalyteAddedResultQualifierUnitD%Rec.LimitsLab Sample ID: LCS 680-506830/7 Matrix: WaterSpikeLCSLCSLCSLCSMes&lt;</li></uul></u<></li></uul></u<></u<>	Analysis Batch: 506635										. ,		
Methane (TCD)         1920         1600         ug/L         83         75.125         2           Lab Sample ID: LCSD 680-506635/40 Matrix: Water Analysis Batch: 506635         Client Sample ID: Lab Control Sample DU Prep Type: Total/N           Analyte         Added         Result Qualifier 288         Unit         D         %Rec.         RR           Ethane         288         250         ug/L         87         75.125         6           Lab Sample ID: MB 680-506830/10 Matrix: Water Analysis Batch: 506830         MB         Result Qualifier         Unit         D         %Rec.         RR           Analyte         Result Qualifier         RL         MDL         Unit         D         %Rec.         RR           Lab Sample ID: MB 680-506830/10 Matrix: Water         MB         MB         Client Sample ID: Method Blar           Analyte         Result Qualifier         RL         MDL         Unit         D         Prepared         Analyze         DII /           Ethylene         1.0         1.0         ug/L         12/18/17 15:52         DII /         12/18/17 15:52         D				Spike	LC	CSD	LCSD				%Rec.		RP
Lab Sample ID: LCSD 680-506635/40 Matrix: Water Analysis Batch: 506635 Analyte Ethane Ethane Ethane Ethane Ethane MB MB Analysis Batch: 506830 MB MB Analyte Ethane 1.1 Water Analysis Batch: 506830 MB MB Analyte Ethane 1.1 Water Analyzed MB MB Analyte Ethane (Client Sample ID: Lab Control Sample DL Water Analyzed MB MB Analyte Ethane (Client Sample ID: ME 680-506830/10 Matrix: Water Analyzed Analyze	Analyte			Added	Re	sult	Qualifier	Unit	D	%Rec	Limits	RPD	Lim
Matrix: Water Analysis Batch: 506635       Prep Type: Total/N         Analysis Batch: 506635       Spike Analyte       Added 288       LCSD 269       LCSD 234       Unit Ug/L       D %Rec.       Kec.       R         Ethane       288       269       234       Ug/L       B7       75.125       6         Lab Sample ID: MB 680-506830/10 Matrix: Water Analysis Batch: 506830       MB       MB       MB       Client Sample ID: Method Blar Prep Type: Total/N         Analyte       Result       Qualifier       RL       MDL       Unit       D       Prepared       Analyzed       Dil F         Ethane       1.1       U       1.1       Ug/L       12/16/17 15.52       Dil F       Dil F       Nalyzed       Dil F       Dil F       Dil F       Dil F       Dil F       Dil F	Methane (TCD)			1920	1	1600		ug/L		83	75 - 125	2	3
Matrix: Water Analysis Batch: 506635       Prep Type: Total/N         Analysis Batch: 506635       Spike Analyte       Added 288       LCSD 269       LCSD 234       Unit Ug/L       D %Rec.       Kec.       R         Ethane       288       269       234       Ug/L       B7       75.125       6         Lab Sample ID: MB 680-506830/10 Matrix: Water Analysis Batch: 506830       MB       MB       MB       Client Sample ID: Method Blar Prep Type: Total/N         Analyte       Result       Qualifier       RL       MDL       Unit       D       Prepared       Analyzed       Dil F         Ethane       1.1       U       1.1       Ug/L       12/16/17 15.52       Dil F       Dil F       Nalyzed       Dil F       Dil F       Dil F       Dil F       Dil F       Dil F	Lab Sample ID: LCSD 680-506635/4	0					c	lient S	ample	ID: Lat	o Control	Sample	e Du
Analysis Batch: 506635       Spike       LCSD       LCSD       Unit       D       %Rec.       RPD       Limits       Limits       RPD       Limits       RPD       Limits       RPD       Limits       RPD       Limits       Limits       RPD       Limits       RPD       Limits       RPD       Limits       Limits <td>Matrix: Water</td> <td></td>	Matrix: Water												
AnalyteSpike AddedLCSDLCSD%Rec.Ri LimitsRPDLin LimitsRPDLin LimitsRPDLin LimitsRPDLin LimitsLin RPDLin RPDLin Lin RPDLin RPDLin RPDLin Lin RPD<	Analysis Batch: 506635												
Ethane         288         250         ug/L         87         75 - 125         6           Ethylene         269         234         ug/L         87         75 - 125         6           Lab Sample ID: MB 680-506830/10 Matrix: Water Analysis Batch: 506830         MB         MB         Client Sample ID: Method Blar Prep Type: Total/N           Analyte         Result Qualifier         RL         MDL         Unit         D         Prepared         Analyzed         Dil F           Ethane         1.1         U         1.1         ug/L         218/17 15:52         Dil F           Ethylene         1.0         U         1.0         ug/L         12/18/17 15:52         Dil F           Methane (TCD)         390         U         390         ug/L         12/18/17 15:52         Dil F           Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830         Spike         LCS         LCS         LCS         Mec.           Analyte         Added         Result         Qualifier         Unit         D         %Rec.           Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830         Spike         LCS         LCS         LCS         Mec.           Analyte         Added         Result         Q				Spike	LC	CSD	LCSD				%Rec.		RP
Ethylene     269     234     ug/L     87     75.125     6       Lab Sample ID: MB 680-506830/10 Matrix: Water Analysis Batch: 506830     MB     Client Sample ID: Method Blar Prep Type: Total/N       Analyte     Result     Qualifier     RL     MDL     Unit     D     Prepared     Analyzed     Dil F       Ethane     1.1     U     1.1     ug/L     12/18/17 15:52     Dil F       Ethylene     1.0     U     1.0     ug/L     12/18/17 15:52     Dil F       Bethane     0.58     U     0.58     ug/L     12/18/17 15:52     Dil F       Methane     0.58     U     0.58     ug/L     12/18/17 15:52     Dil F       Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830     Spike     LCS     LCS     LCS     Methane (TCD)     12/18/17 15:52       Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830     Spike     LCS     LCS     LCS     LCS     LCS     LCS       Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830     Spike     LCS     LCS     LCS     Mec.       Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830     Spike     LCS     LCS     LCS     Mec.       Analyte     288     278     Qualifier     Unit	Analyte			Added	Re	sult	Qualifier	Unit	D	%Rec	Limits	RPD	Lim
Lab Sample ID: MB 680-506830/10 Matrix: Water Analysis Batch: 506830Client Sample ID: Method Blar Prep Type: Total/NAnalyteResultQualifierRLMDLUnitDPreparedAnalyzedDil FEthane1.1U1.1ug/L12/18/17 15:52Dil FEthylene1.0U1.0ug/L12/18/17 15:52Methane0.58U0.58ug/L12/18/17 15:52Methane (TCD)390U390ug/L12/18/17 15:52Lab Sample ID: LCS 680-506830/3 Matrix: Water AnalyteSpikeLCSLCSLCSLCSMetc.AnalyteAddedResultQualifierUnitD%Rec.LimitsMethane (TCD)19201730ug/L-9075 - 125-Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830SpikeLCSLCSLCSLCSLCSLimits -AnalyteAddedResultQualifierUnitD%Rec.Limits Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830SpikeLCSLCSLCSKRec.Limits AnalyteAddedResultQualifierUnitD%Rec.Limits Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830SpikeLCSLCSLCSLCSAnalyte288278QualifierUnitD%Rec.Limit	Ethane			288		250		ug/L		87	75 - 125	6	3
Matrix: Water Analysis Batch: 506830     MB     MB       Analyte     Result 1.1     Qualifier 1.1     RL U     MDL 1.1     Unit Ug/L     D Prepared     Analyzed 12/18/17 15:52     Dil F       Ethane     1.1     U     1.1     Ug/L     12/18/17 15:52     Dil F       Ethylene     1.0     U     1.0     ug/L     12/18/17 15:52       Methane     0.58     U     0.58     ug/L     12/18/17 15:52       Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830     Spike     LCS     LCS     LCS       Analyte     Added     Result 1920     Qualifier     Unit Ug/L     D     %Rec. Limits       Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830     Spike     LCS     LCS     LCS     Unit Ug/L     D     %Rec. Limits       Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830     Spike     LCS     LCS     LCS     Unit Ug/L     D     %Rec. Limits       Analyte     Spike     LCS     LCS     LCS     LCS     Matrix: Water Analysis Batch: 506830     Methane     D     %Rec. Limits     Unit     D     %Rec. Limits       Analyte     288     278     278     Unit     D     %Rec. Limits     Unit	Ethylene			269		234		ug/L		87	75 - 125	6	3
Analysis Batch: 506830AnalyteResultQualifierRLMDLUnitDPreparedAnalyzedDil FEthane1.1U1.1ug/L12/18/17 15:52Ethylene1.0U1.0ug/L12/18/17 15:52Methane0.58U0.58ug/L12/18/17 15:52Methane (TCD)390U390ug/L12/18/17 15:52Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830AnalyteAdded 1920Result 1730Qualifier ug/LUnit ug/LD %Rec. 4methane 90%Rec. Limits 75-125Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830Spike Added ResultLCS Qualifier QualifierUnit ug/LD %Rec. 4methane (Ug/LMethane %Rec. Limits (Ug/LLab Control Samp Prep Type: Total/NAnalyteAdded 288278Qualifier Unit Ug/LD %Rec 96%Rec. Total/N	Lab Sample ID: MB 680-506830/10									ent Sam	nnle ID: M	ethod I	Blan
MBMBAnalyteResultQualifierRLMDLUnitDPreparedAnalyzedDil FEthane1.1U1.1ug/L12/18/17 15:5212/18/17 15:52Dil FEthylene1.0U1.0ug/L12/18/17 15:5212/18/17 15:52Methane0.58U0.58ug/L12/18/17 15:52Methane (TCD)390U390ug/L12/18/17 15:52Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830SpikeLCSLCSLCS%Rec.AnalyteAddedResultQualifierUnitD%Rec.LimitsMethane (TCD)19201730UitD%Rec.LimitsAnalyteAddedResultQualifierUnitD%Rec.Analyte Methane (TCD)19201730UitD%Rec.Matrix: Water Analysis Batch: 506830SpikeLCSLCSClient Sample ID: Lab Control Samp Prep Type: Total/NMatrix: Water Analysis Batch: 506830SpikeLCSLCS%Rec.Analyte288278QualifierUnitD%Rec.Ethane288278QualifierUnitD%Rec.Unit ug/LD%Rec.Limits75-125125	Matrix: Water								Cire	one oun		cuiou i	
AnalyteResultQualifierRLMDLUnitDPreparedAnalyzedDil FEthane1.1U1.1ug/L12/18/17 15:5212/18/17 15:5212/18/17 15:5212/18/17 15:52Ethylene1.0U1.0ug/L12/18/17 15:5212/18/17 15:5212/18/17 15:52Methane0.58U0.58ug/L12/18/17 15:5212/18/17 15:52Methane (TCD)390U390ug/L12/18/17 15:52Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830SpikeLCSLCSLCSMethane%Rec.AnalyteAddedResultQualifierUnitD%Rec.LimitsMethane (TCD)19201730UnitD%Rec.LimitsLab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830SpikeLCSLCSLCSMethaneAnalyteAddedResultQualifierUnitD%Rec.LimitsAnalyte288278UnitD%Rec.LimitsEthane288278UnitD%Rec.Limits									Cile	one oun	-		
Ethane         1.1         U         1.1         ug/L         12/18/17 15:52           Ethylene         1.0         U         1.0         ug/L         12/18/17 15:52           Methane         0.58         U         0.58         ug/L         12/18/17 15:52           Methane         0.58         U         0.58         ug/L         12/18/17 15:52           Methane (TCD)         390         U         390         ug/L         12/18/17 15:52           Lab Sample ID: LCS 680-506830/3         Matrix: Water         Analysis Batch: 506830         Client Sample ID: Lab Control Samp Prep Type: Total/N           Analyte         Added         Result         Qualifier         Unit         D         %Rec.           Lab Sample ID: LCS 680-506830/7         1920         1730         Ug/L         D         %Rec.           Matrix: Water         Analysis Batch: 506830         Spike         LCS         LCS         Client Sample ID: Lab Control Samp Prep Type: Total/N           Matrix: Water         Analysis Batch: 506830         Spike         LCS         LCS         LCS         Methane           Analyte         288         278         Qualifier         Unit         D         %Rec.           Limits         288         2	Analysis Batch: 506830								Circ	un oun	-		
Ethylene       1.0       U       1.0       ug/L       12/18/17 15:52         Methane       0.58       U       0.58       ug/L       12/18/17 15:52         Methane (TCD)       390       U       390       ug/L       12/18/17 15:52         Lab Sample ID: LCS 680-506830/3       Matrix: Water       Client Sample ID: Lab Control Samp       Prep Type: Total/N         Analyte       Added       Result       Qualifier       Unit       D       %Rec.         Methane (TCD)       1920       1730       Client Sample ID: Lab Control Samp       Prep Type: Total/N         Lab Sample ID: LCS 680-506830/7       Matrix: Water       Analysis Batch: 506830       %Rec.       Limits         Matrix: Water       Spike       LCS       LCS       LCS       Matrix: Water         Analysis Batch: 506830       Spike       LCS       LCS       Client Sample ID: Lab Control Samp         Matrix: Water       Spike       LCS       LCS       Methane       %Rec.         Analysis Batch: 506830       Spike       LCS       LCS       Methane       %Rec.         Matrix: Water       Analysis Batch: 506830       Spike       LCS       LCS       LCS       Methane         Manalysis       Batch: 506830       <	Analysis Batch: 506830	MB	МВ						Cin	un oun	-		
Methane0.58U0.58ug/L12/18/1715:52Methane (TCD)390390ug/L12/18/1715:52Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830SpikeLCSLCSClient Sample ID: Lab Control Samp Prep Type: Total/NAnalyteAddedResultQualifierUnitD 90%Rec.LimitsMethane (TCD)19201730UnitD ug/L $\frac{90}{90}$ 75-125Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830SpikeLCS LCSLCS LSLCS Lob Control Samp Prep Type: Total/NAnalyteAddedSpikeLCS 1920LCSLCS 1730MethaneMethaneAnalyteAddedSpikeLCS 278LCSMethaneMethaneAnalyte288278Qualifier ug/LD 96%Rec. 75-125Limits 75-125	Analyte	Result	Qualifier			I	MDL Unit				Prep Ty	be: Tot	al/N
Methane (TCD)390 U390 u390 ug/L12/18/17 15:52Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830SpikeLCSLCSClient Sample ID: Lab Control Samp Prep Type: Total/NAnalyte Methane (TCD)AddedResult 1920Qualifier 1730Unit ug/LD%Rec. 90Limits 75 - 125Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830Spike AddedLCS LCSLCS Unit ug/LD%Rec. 90Limits 75 - 125Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830Spike AddedLCS ResultLCS Unit UnitD%Rec. Frep Type: Total/NAnalyte Ethane288278Qualifier Unit ug/LD%Rec. Prep Type: Total/N	Analyte	Result	Qualifier U		1.1	1					Prep Typ	ced ced	al/N
Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830Client Sample ID: Lab Control Samp Prep Type: Total/NAnalyteAddedResultQualifierUnitD%Rec. 90LimitsAnalyteAddedResultQualifierUnitD%Rec. 90LimitsLab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830SpikeLCSLCSClient Sample ID: Lab Control Samp Prep Type: Total/NAnalyteAddedResultQualifierUnitD%Rec. 40Method Sample ID: Lab Control Samp Prep Type: Total/NMatrix: Water Analysis Batch: 506830SpikeLCSLCS%Rec. 4dded%Rec. 4ddedAnalyteAddedResultQualifierUnitD%Rec. 40Limits 75 - 125Ethane288278ug/L9675 - 125-	Analyte	<b>Result</b> 1.1 1.0	Qualifier U U		1.1 1.0	1	ug/L ug/L				Prep Typ Analyz 12/18/17 12/18/17	zed 15:52	al/N
Matrix: Water       Prep Type: Total/N         Analysis Batch: 506830       Spike       LCS       LCS       %Rec.         Analyte       Added       Result       Qualifier       Unit       D       %Rec       Limits	Analyte Ethane Ethylene Methane	<b>Result</b> 1.1 1.0 0.58	Qualifier U U U		1.1 1.0 0.58	1	ug/L ug/L ug/L				Prep Typ Analyz 12/18/17 12/18/17	zed 15:52	al/N
Analysis Batch: 506830       Spike       LCS       LCS       %Rec.         Analyte       Added       Result       Qualifier       Unit       D       %Rec.         Methane (TCD)       1920       1730       Qualifier       Unit       D       %Rec.         Lab Sample ID: LCS 680-506830/7       1920       1730       Client Sample ID: Lab Control Samp         Matrix: Water       Prep Type: Total/N         Analyte       Added       Result       Qualifier       Unit       D       %Rec.         Analyte       Added       Result       Qualifier       Unit       D       %Rec.         Ethane       288       278       278       Unit       D       %Rec       Limits	Analyte Ethane Ethylene	<b>Result</b> 1.1 1.0 0.58	Qualifier U U U		1.1 1.0 0.58	1	ug/L ug/L ug/L				Prep Typ Analyz 12/18/17 12/18/17 12/18/17	<b>2ed</b> 15:52 15:52 15:52	al/N
SpikeLCSLCS%Rec.AnalyteAddedResultQualifierUnitD%Rec.Methane (TCD)19201730UnitUg/LP%Rec.Lab Sample ID: LCS 680-506830/719201730Client Sample ID: Lab Control SampleMatrix: WaterSpikeLCSLCS%Rec.Analysis Batch: 506830SpikeLCSLCS%Rec.AnalyteAddedResultQualifierUnitD%Rec.Ethane288278ug/L9675-125	Analyte Ethane Ethylene Methane Methane (TCD) Lab Sample ID: LCS 680-506830/3	<b>Result</b> 1.1 1.0 0.58	Qualifier U U U		1.1 1.0 0.58	1	ug/L ug/L ug/L	Cli	D P	repared	Prep Typ Analyz 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17 2: Lab Cor	eed 15:52 15:52 15:52 15:52 15:52	al/N Dil Fa
AnalyteAddedResultQualifierUnitD%RecLimitsMethane (TCD)1920173017300075 - 1250Lab Sample ID: LCS 680-506830/7Matrix: WaterClient Sample ID: Lab Control Samp Prep Type: Total/NMatrix: WaterSpikeLCSLCS%Rec.AnalyteAddedResultQualifierUnitD%Rec.Ethane288278ug/L9675 - 125	Analyte Ethane Ethylene Methane Methane (TCD) Lab Sample ID: LCS 680-506830/3 Matrix: Water	<b>Result</b> 1.1 1.0 0.58	Qualifier U U U		1.1 1.0 0.58	1	ug/L ug/L ug/L	Clie	D P	repared	Prep Typ Analyz 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17 2: Lab Cor	eed 15:52 15:52 15:52 15:52 15:52	al/N Dil Fa
Lab Sample ID: LCS 680-506830/7       Client Sample ID: Lab Control Sample ID: Ab Control Sample ID: Lab Control Sample	Analyte Ethane Ethylene Methane Methane (TCD) Lab Sample ID: LCS 680-506830/3	<b>Result</b> 1.1 1.0 0.58	Qualifier U U U	Snike	1.1 1.0 0.58 390		ug/L ug/L ug/L	Clie	D P	repared	Prep Typ Analyz 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17	<b>2ed</b> 15:52 15:52 15:52 15:52 15:52	al/N Dil Fa
Matrix: Water       Prep Type: Total/N         Analysis Batch: 506830       Spike       LCS       KRec.         Analyte       Added       Result       Qualifier       Unit       D       %Rec.         Ethane       288       278       ug/L       96       75-125	Analyte Ethane Ethylene Methane Methane (TCD) Lab Sample ID: LCS 680-506830/3 Matrix: Water	<b>Result</b> 1.1 1.0 0.58	Qualifier U U U	•	1.1 1.0 0.58 390	LCS	ug/L ug/L ug/L ug/L		D P ent Sa	repared mple ID	Prep Typ Analyz 12/18/17	<b>2ed</b> 15:52 15:52 15:52 15:52 15:52	al/N/ Dil Fa
Spike       LCS       LCS       %Rec.         Analyte       Added       Result       Qualifier       Unit       D       %Rec       Limits         Ethane       288       278       ug/L       96       75-125       75-125	Analyte Ethane Ethylene Methane Methane (TCD) Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830	<b>Result</b> 1.1 1.0 0.58	Qualifier U U U	Added	1.1 1.0 0.58 390	LCS	ug/L ug/L ug/L ug/L	Unit	D P ent Sa	mple ID %Rec	Prep Typ Analyz 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17 Contemporal States Sta	<b>2ed</b> 15:52 15:52 15:52 15:52 15:52	al/N Dil Fa
AnalyteAddedResultQualifierUnitD%RecLimitsEthane288278ug/L9675-125	Analyte Ethane Ethylene Methane Methane (TCD) Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830 Analyte Methane (TCD) Lab Sample ID: LCS 680-506830/7	<b>Result</b> 1.1 1.0 0.58	Qualifier U U U	Added	1.1 1.0 0.58 390	LCS	ug/L ug/L ug/L ug/L	Unit ug/L	DP ent Sa	mple ID	Prep Tyj Analyz 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17 C Lab Cor Prep Tyj %Rec. Limits 75 - 125 C Lab Cor	2ed 15:52 15:52 15:52 15:52 15:52 15:52 15:52 15:52 15:52 15:52	al/N Dil Fa ampl al/N
Ethane 288 278 ug/L 96 75-125	Analyte Ethane Ethylene Methane Methane (TCD) Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830 Analyte Methane (TCD) Lab Sample ID: LCS 680-506830/7 Matrix: Water	<b>Result</b> 1.1 1.0 0.58	Qualifier U U U	Added 1920	1.1 1.0 0.58 390 <b>Re</b>	LCS esult 1730	ug/L ug/L ug/L Ug/L	Unit ug/L	DP ent Sa	mple ID	Prep Tyj Analyz 12/18/17	2ed 15:52 15:52 15:52 15:52 15:52 15:52 15:52 15:52 15:52 15:52	al/N Dil Fa amp al/N
5	Analyte Ethane Ethylene Methane Methane (TCD) Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830 Analyte Methane (TCD) Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830	<b>Result</b> 1.1 1.0 0.58	Qualifier U U U	Added 1920 Spike	1.1 1.0 0.58 390 <b>Re</b>	LCS esult 1730	ug/L ug/L ug/L Ug/L Ug/L	Unit ug/L Clie	DP ent Sa D ent Sa	mple ID %Rec 90 mple ID	Prep Typ Analyz 12/18/17	2ed 15:52 15:52 15:52 15:52 15:52 15:52 15:52 15:52 15:52 15:52	al/N Dil Fa ampl al/N
	Analyte Ethane Ethylene Methane Methane (TCD) Lab Sample ID: LCS 680-506830/3 Matrix: Water Analysis Batch: 506830 Analyte Methane (TCD) Lab Sample ID: LCS 680-506830/7 Matrix: Water Analysis Batch: 506830 Analyte	<b>Result</b> 1.1 1.0 0.58	Qualifier U U U	Added 1920 Spike Added	1.1 1.0 0.58 390 <b>Re</b>	LCS esult 1730 LCS esult	ug/L ug/L ug/L Ug/L Ug/L	Unit ug/L Clie Unit	DP ent Sa D ent Sa	mple ID <u>%Rec</u> 90 mple ID	Prep Typ Analyz 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17 12/18/17 2: Lab Corr Prep Typ %Rec. Limits 75 - 125 2: Lab Corr Prep Typ %Rec. Limits	2ed 15:52 15:52 15:52 15:52 15:52 15:52 15:52 15:52 15:52 15:52	al/N Dil Fa ampl al/N

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## Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: LCSD 680-506830/4 Matrix: Water Analysis Batch: 506830			C	Client Sa	ample	ID: Lab	Control Prep Ty	•	•
Analysis Datch. 300030	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Methane (TCD)	1920	1800		ug/L		94	75 - 125	4	30
ACT									
Lab Sample ID: LCSD 680-506830/8 Matrix: Water Analysis Batch: 506830			C	Client Sa	ample	ID: Lab	Control Prep Ty	•	
Matrix: Water	Spike	LCSD	LCSD	Client Sa	ample	ID: Lab		•	al/NA
Matrix: Water	Spike Added			Client Sa Unit	ample D	ID: Lat	Prep Tyj	•	
Matrix: Water Analysis Batch: 506830	•		LCSD		-		Prep Tyj %Rec.	pe: Tot	al/NA RPD

#### Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-50604 Matrix: Water Analysis Batch: 506233	47/1-А мв	МВ					Prep Type	le ID: Method : Total Recov Prep Batch:	verable
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.050	U	0.050		mg/L		12/12/17 10:44	12/13/17 04:05	1
Iron, Dissolved	0.050	U	0.050		mg/L		12/12/17 10:44	12/13/17 04:05	1
Manganese	0.010	U	0.010		mg/L		12/12/17 10:44	12/13/17 04:05	1
Manganese, Dissolved	0.010	U	0.010		mg/L		12/12/17 10:44	12/13/17 04:05	1
Lab Sample ID: LCS 680-5060		č	0.010		ing/L	Clien		Lab Control \$	Sample

#### Lab Sample ID: LCS 680-506047/2-A Matrix: Water Analysis Batch: 506233

Analysis Batch: 506233							Prep Ba	tch: 506047
	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Iron	5.00	5.19		mg/L		104	80 - 120	
Iron, Dissolved	5.00	5.19		mg/L		104	80 - 120	
Manganese	0.500	0.538		mg/L		108	80 - 120	
Manganese, Dissolved	0.500	0.538		mg/L		108	80 - 120	

## Method: 325.2-1978 - Chloride

Lab Sample ID: MB 680-506967/17 Matrix: Water Analysis Batch: 506967									Clie	ent Sam	ple ID: Metho Prep Type: T	
	MB	MB										
Analyte	Result	Qualifier		RL	F	MDL U	Init		D P	repared	Analyzed	Dil Fac
Chloride	1.0	U		1.0		m	ng/L				12/18/17 16:07	1
Lab Sample ID: LCS 680-506967/18 Matrix: Water								Clie	nt Sar	nple ID:	: Lab Control Prep Type: T	
Analysis Batch: 506967												
			Spike		LCS	LCS					%Rec.	
Analyte			Added	I	Result	Qualif	ier	Unit	D	%Rec	Limits	
Chloride			25.0		26.3			mg/L		105	85 - 115	

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Prep Type: Total Recoverable

## **QC Sample Results**

## Method: 325.2-1978 - Chloride (Continued)

.ab Sample ID: LCSD 680-506 Aatrix: Water	967/20				C	lient Sa	ample	ID: Lab	Control S Prep Type		
Analysis Batch: 506967			Spike	LCSD	LCSD				%Rec.		RP
Analyte			Added		Qualifier	Unit	D	%Rec	Limits	RPD	Lim
Chloride			25.0	27.2		mg/L		109	85 - 115	3	
			20.0	61.6		mg/L		105	00-110	5	
ab Sample ID: MB 680-50696 Aatrix: Water	8/7						Clie	ent Sam	ple ID: Me Prep Type		
Analysis Batch: 506968											
-	M	B MB									
Analyte		it Qualifier			MDL Unit		D P	repared	Analyze	d	Dil F
Chloride	1.	0 U		1.0	mg/L				12/18/17 1	4:29	
ab Sample ID: LCS 680-5069	68/8					Clie	nt Sai	mple ID	: Lab Cont		
Matrix: Water									Prep Type		tal/n
Analysis Batch: 506968			Spike	1.09	LCS				%Rec.		
Analyte			Added		Qualifier	Unit	D	%Rec	Limits		
			25.0	26.1	waanner	mg/L		105	85 - 115		
Silonde			25.0	20.1		mg/L		105	00-110		
_ab Sample ID: LCSD 680-506 Matrix: Water	968/10				C	lient Sa	ample	ID: Lab	Control S Prep Type		
Analysis Batch: 506968										-	
-			Spike	LCSD	LCSD				%Rec.		R
nalyte			Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Li
										-	
ethod: 353.2-1993 R2.0 -	<b>X</b>	n, Nitrato	25.0 e-Nitrite	26.2		mg/L		105	85-115	0	
Chloride ethod: 353.2-1993 R2.0 - Lab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753	<b>X</b>	n, Nitrato				mg/L	Clie		85-115 nple ID: Me Prep Typ	thod	Bla
ethod: 353.2-1993 R2.0 - _ab Sample ID: MB 680-50575 Matrix: Water	3/13	n, Nitrato <sup>3 MB</sup>			<u>.</u>	mg/L	Clie		nple ID: Me	thod	Bla
ethod: 353.2-1993 R2.0 - _ab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte	i3/13 M		e-Nitrite	)	MDL Unit				nple ID: Me	thod e: To	Bla
ethod: 353.2-1993 R2.0 - .ab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte	53/13 Mi Resu	в мв	e-Nitrite	)	MDL Unit			ent San	nple ID: Me Prep Typ	thod e: To	Bla tal/I
ethod: 353.2-1993 R2.0 - Lab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Jitrate as N Lab Sample ID: LCS 680-5057 Matrix: Water	3/13 Mi <u>Resu</u> 0.05	3 MB It Qualifier	e-Nitrite				<u>D</u> P	ent San	nple ID: Me Prep Typ Analyze	thod e: To ed 6:48	Bla tal/I Dil I
ethod: 353.2-1993 R2.0 - Lab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Jitrate as N Lab Sample ID: LCS 680-5057 Matrix: Water	3/13 Mi <u>Resu</u> 0.05	3 MB It Qualifier	e-Nitrite	RL	mg/∟		<u>D</u> P	ent San	nple ID: Me Prep Typ Analyze 12/08/17 1 2: Lab Cont Prep Typ	thod e: To ed 6:48	Bla tal/I Dil I
ethod: 353.2-1993 R2.0 - Lab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Litrate as N Lab Sample ID: LCS 680-5057 Matrix: Water Analysis Batch: 505753	3/13 Mi <u>Resu</u> 0.05	3 MB It Qualifier	e-Nitrite	RL	mg/L	Clie	D_P_	ent San repared mple ID	nple ID: Me Prep Typ Analyze 12/08/17 1 2: Lab Cont Prep Typ %Rec.	thod e: To ed 6:48	Bla tal/N Dil F
ethod: 353.2-1993 R2.0 - Lab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Nitrate as N Lab Sample ID: LCS 680-5057 Matrix: Water Analysis Batch: 505753	3/13 Mi <u>Resu</u> 0.05	3 MB It Qualifier	e-Nitrite 0.0 Spike Added	RL 050 LCS Result	mg/L LCS Qualifier	Clie	<u>D</u> P	repared mple ID %Rec	nple ID: Me Prep Typ Analyze 12/08/17 1 2: Lab Cont Prep Typ %Rec. Limits	thod e: To ed 6:48	Blar tal/N Dil F
ethod: 353.2-1993 R2.0 - Lab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Vitrate as N Lab Sample ID: LCS 680-5057 Matrix: Water Analysis Batch: 505753 Analyte Vitrate as N	3/13 Mi <u>Resu</u> 0.05	3 MB It Qualifier	e-Nitrite 0.0 Spike Added 0.500	RL 050 LCS Result 0.490	mg/L LCS Qualifier	Clie Unit mg/L	D_P_	repared mple ID <u>%Rec</u> 98	Analyze Prep Type 12/08/17 1 2: Lab Cont Prep Type %Rec. Limits 75-125	thod e: To ed 6:48	Bla tal/N Dil F
ethod: 353.2-1993 R2.0 - ab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Malyte Lab Sample ID: LCS 680-5057 Matrix: Water Analysis Batch: 505753 Malyte Malyte Malyte Matriate Nitrite as N	3/13 Mi <u>Resu</u> 0.05	3 MB It Qualifier	<b>Spike</b> Added 0.500 1.00	RL 050 LCS Result 0.490 0.982	mg/L LCS Qualifier	Clie Unit mg/L mg/L	D_P_	repared mple ID <u>%Rec</u> 98 98	Analyze Prep Type Analyze 12/08/17 1 2: Lab Cont Prep Type %Rec. Limits 75 - 125 90 - 110	thod e: To ed 6:48	Bla tal/I Dil I
ethod: 353.2-1993 R2.0 - ab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Malyte Lab Sample ID: LCS 680-5057 Matrix: Water Analysis Batch: 505753 Malyte Malyte Malyte Matriate Nitrite as N	3/13 Mi <u>Resu</u> 0.05	3 MB It Qualifier	e-Nitrite 0.0 Spike Added 0.500	RL 050 LCS Result 0.490	mg/L LCS Qualifier	Clie Unit mg/L	D_P_	repared mple ID <u>%Rec</u> 98	Analyze Prep Type 12/08/17 1 2: Lab Cont Prep Type %Rec. Limits 75-125	thod e: To ed 6:48	Bla tal/I Dil I
ethod: 353.2-1993 R2.0 - Lab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Vitrate as N Lab Sample ID: LCS 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Vitrate as N Vitrate as N Vitrate Si N Vitrate Nitrite as N Vitrite as N Vitrite as N	53/13 Mi Resu 0.05 53/16	3 MB It Qualifier	<b>Spike</b> Added 0.500 1.00	RL 050 LCS Result 0.490 0.982	mg/L LCS Qualifier	Clie Unit mg/L mg/L mg/L	D P ent Sar	repared mple ID <u>%Rec</u> 98 98 98	Analyze Prep Type Analyze 12/08/17 1 2: Lab Cont Prep Type %Rec. Limits 75 - 125 90 - 110	thod e: To 6:48 crol S e: To	Bla tal/N Dil F amp tal/N
ethod: 353.2-1993 R2.0 - Lab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Jitrate as N Lab Sample ID: LCS 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Jitrate as N Jitrate Nitrite as N Jitrate Nitrite as N Jitrite as N Lab Sample ID: 680-146571-4	53/13 Mi Resu 0.05 53/16 MS	B MB It Qualifier 0 U	e-Nitrite 0.0 Spike Added 0.500 1.00 0.500	RL 050 LCS Result 0.490 0.982 0.492	mg/L LCS Qualifier	Clie Unit mg/L mg/L mg/L	D P ent Sar	repared mple ID <u>%Rec</u> 98 98 98	Analyze Analyze 12/08/17 1 2: Lab Cont Prep Typ %Rec. Limits 75 - 125 90 - 110 90 - 110 ID: BSA-W Prep Typ	thod e: To 6:48 crol S e: To	Bla tal/f Dil f amp tal/f
ethod: 353.2-1993 R2.0 - Lab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Jitrate as N Lab Sample ID: LCS 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Jitrate Nitrite as N Jitrate Nitrite as N Jitrate Sitrate Sit	53/13 MI Resu 0.05 53/16 MS Sample Sa	B MB It Qualifier 0 U	e-Nitrite 0.0 Spike Added 0.500 1.00 0.500 Spike	RL 050 LCS Result 0.490 0.982 0.492 MS	LCS Qualifier	Clie Unit mg/L mg/L mg/L	nt Sar	ent San repared mple ID <u>%Rec</u> 98 98 98 98 Sample	Analyze Prep Type Analyze 12/08/17 1 2: Lab Cont Prep Type %Rec. Limits 75-125 90-110 90-110 ID: BSA-M Prep Typ %Rec.	thod e: To 6:48 crol S e: To	Bla tal/N Dil F amp tal/N
ethod: 353.2-1993 R2.0 - Lab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Vitrate as N Lab Sample ID: LCS 680-50575 Matrix: Water Analyte Vitrate as N Vitrate Nitrite as N Vitrate Nitrite as N Vitrate Sample ID: 680-146571-4 Matrix: Water Analysis Batch: 505753 Analyte	3/13 MI Resu 0.05 53/16 MS Sample Sa Result Q	B MB It Qualifier 0 U	e-Nitrite 0.00 Spike Added 0.500 1.00 0.500 Spike Added	RL 050 LCS Result 0.490 0.982 0.492 0.492 MS Result	mg/L LCS Qualifier MS Qualifier	Clie Unit mg/L mg/L mg/L C Unit	D P ent Sar	ent San repared mple ID %Rec 98 98 98 Sample	Analyze Prep Type Analyze 12/08/17 1 2: Lab Cont Prep Type %Rec. Limits 75-125 90-110 90-110 ID: BSA-M Prep Type %Rec. Limits	thod e: To 6:48 crol S e: To	Bla tal/N Dil F amp tal/N
ethod: 353.2-1993 R2.0 - Lab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte litrate as N Lab Sample ID: LCS 680-50575 Matrix: Water Analysis Batch: 505753 Analyte litrate as N Lab Sample ID: 680-146571-4 Matrix: Water Analysis Batch: 505753 Analyte Matrix: Water Analysis Batch: 505753	3/13 MI Resu 0.05 53/16 MS MS Sample Sa Result Q 0.050 U	B MB It Qualifier 0 U	e-Nitrite 0.00 Spike Added 0.500 1.00 0.500 Spike Added 0.500	RL           050           LCS           Result           0.490           0.982           0.492           MS           Result           0.268	MS Qualifier F1	Clie Unit mg/L mg/L C Unit mg/L	nt Sar	ent San repared mple ID <u>%Rec</u> 98 98 98 98 Sample <u>%Rec</u> 54	Analyze Prep Type Analyze 12/08/17 1 2: Lab Cont Prep Type %Rec. Limits 75-125 90-110 90-110 ID: BSA-W Prep Type %Rec. Limits 75-125	thod e: To 6:48 crol S e: To	Bla tal/N Dil F amp tal/N
ethod: 353.2-1993 R2.0 - Lab Sample ID: MB 680-50575 Matrix: Water Analysis Batch: 505753 Analyte litrate as N Lab Sample ID: LCS 680-50575 Matrix: Water Analysis Batch: 505753 Analyte Lab Sample ID: 680-146571-4 Matrix: Water Analysis Batch: 505753 Analyte	3/13 MI Resu 0.05 53/16 MS Sample Sa Result Q	B MB It Qualifier 0 U	e-Nitrite 0.00 Spike Added 0.500 1.00 0.500 Spike Added	RL 050 LCS Result 0.490 0.982 0.492 0.492 MS Result	MS Qualifier F1 F1	Clie Unit mg/L mg/L mg/L C Unit	nt Sar	ent San repared mple ID %Rec 98 98 98 Sample	Analyze Prep Type Analyze 12/08/17 1 2: Lab Cont Prep Type %Rec. Limits 75-125 90-110 90-110 ID: BSA-M Prep Type %Rec. Limits	thod e: To 6:48 crol S e: To	Bla tal/f Dil f amp tal/f

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## Method: 353.2-1993 R2.0 - Nitrogen, Nitrate-Nitrite (Continued)

Lab Sample ID: 680-146571- Matrix: Water Analysis Batch: 505753	4 MSD					С	lient S	ample	ID: BSA-I Prep Typ		
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Nitrate as N	0.050	U F1	0.500	0.262	F1	mg/L		52	75 - 125	2	30
Nitrate Nitrite as N	0.050	U F1	1.00	0.585	F1	mg/L		58	90 - 110	1	10
Nitrite as N	0.050	U F1	0.500	0.323	F1	mg/L		65	90 - 110	1	10

## Method: 375.4-1978 - Sulfate

Lab Sample ID: MB 680-506969/4 Matrix: Water Analysis Batch: 506969	Ļ								Cli	ent Sar	nple ID: M Prep Tyj		
-	MB	MB											
Analyte	Result	Qualifier		RL	M	IDL U	Jnit		DI	Prepared	Analyz	zed	Dil Fac
Sulfate	5.0	U		5.0		n	ng/L				12/18/17	13:47	1
Lab Sample ID: LCS 680-506969	5							Cli	ent Sa	imple IC	): Lab Cor	ntrol Sa	ample
Matrix: Water											Prep Ty	pe: To	tal/NA
Analysis Batch: 506969												•	
-			Spike		LCS	LCS					%Rec.		
Analyte			Added	F	Result	Quali	fier	Unit	D	%Rec	Limits		
Sulfate			20.0		19.3			mg/L		97	75 - 125		
Lab Sample ID: LCSD 680-50696 Matrix: Water	9/7						С	lient S	ample	e ID: La	b Control Prep Ty	-	
Analysis Batch: 506969			Spike		LCSD						%Rec.		RPD
			Added		Result			Unit	D	%Rec	Limits	RPD	Limit
Analyte													

## Method: 415.1-1974 - DOC

Lab Sample ID: LCS 680-511920/4 Matrix: Water Analysis Batch: 511920				Clie	nt Sar	•	: Lab Cor Prep Type		-
	Spike	LCS	LCS				%Rec.		
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Dissolved Organic Carbon	20.0	20.7		mg/L		104	80 - 120		
Lab Sample ID: LCSD 680-511920/5 Matrix: Water Analysis Batch: 511920			C	Client Sa	ample		Control Prep Type		-
· · · · · · · · · · · · · · · · · · ·	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Dissolved Organic Carbon	20.0	20.2		mg/L		101	80 - 120	3	20

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## **QC Sample Results**

Method: 415.1-1974 - TOC

Lab Sample ID: MB 680-506527/2 Matrix: Water									CI	ient S	Sam	ple ID: M Prep Ty		
Analysis Batch: 506527												1100.13		
······ <b>,</b> ······ <b>,</b> ····················	MB	MB												
Analyte	Result	Qualifier		RL		MDL	Unit		D	Prepa	red	Analyz	zed	Dil Fa
Total Organic Carbon	1.0	U		1.0			mg/L					12/14/17	08:20	
Lab Sample ID: LCS 680-506527/3								Clie	ent Sa	ample	e ID:	: Lab Cor	ntrol S	ampl
Matrix: Water												Prep Ty		
Analysis Batch: 506527														
-			Spike		LCS	LCS	;					%Rec.		1
Analyte			Added		Result	Qua	lifier	Unit	0	) %R	ec	Limits		
Total Organic Carbon			20.0		18.7			mg/L		_	94	80 - 120		
Lab Sample ID: LCSD 680-506527/4	Ļ						С	lient Sa	ampi	e ID:	Lab	Control	Samp	le Du
Matrix: Water												Prep Ty		
Analysis Batch: 506527														
			Spike		LCSD	LCS	D					%Rec.		RP
Analyte			Added		Result	Qua	lifier	Unit	r	) %R	lec	Limits	RPD	Lim
Total Organic Carbon			20.0		18.6			mg/L			93	80 - 120	0	2
•								mg/L				80 - 120	0	2
Total Organic Carbon								mg/L			93			
Total Organic Carbon								mg/L			93	ple ID: M	ethod	Blan
Total Organic Carbon //ethod: SM 2320B - Alkalinity Lab Sample ID: MB 310-190007/1								mg/L			93		ethod	Blan
Total Organic Carbon /lethod: SM 2320B - Alkalinity Lab Sample ID: MB 310-190007/1 Matrix: Water		MB						mg/L			93	ple ID: M	ethod	Blan
Total Organic Carbon /lethod: SM 2320B - Alkalinity Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 Analyte	МВ	MB Qualifier		RL	18.6		Unit		CI		93 Sam	ple ID: M	ethod pe: To	Blan
Total Organic Carbon /lethod: SM 2320B - Alkalinity Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 Analyte	МВ	Qualifier		RL 5.0	18.6		Unit mg/L		CI	ient s	93 Sam	ple ID: M Prep Ty	ethod pe: Tc	Blan otal/N/ Dil Fa
Total Organic Carbon <b>lethod: SM 2320B - Alkalinity</b> Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 Analyte Alkalinity as CaCO3	MB Result	Qualifier			18.6				CI	ient ( Prepa	93 Sam	ple ID: M Prep Ty Analy: 12/26/17	ethod pe: To zed 19:08	Blan otal/NA Dil Fa
Total Organic Carbon <b>lethod: SM 2320B - Alkalinity</b> Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 Analyte Alkalinity as CaCO3 Lab Sample ID: LCS 310-190007/2	MB Result	Qualifier			18.6				CI	ient ( Prepa	93 Sam	ple ID: M Prep Ty  12/26/17 : Lab Cor	ethod pe: To zed 19:08	Blan otal/N/ Dil Fa
Total Organic Carbon <b>lethod: SM 2320B - Alkalinity</b> Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 <u>Analyte</u> Alkalinity as CaCO3 Lab Sample ID: LCS 310-190007/2 Matrix: Water	MB Result	Qualifier			18.6				CI	ient ( Prepa	93 Sam	ple ID: M Prep Ty Analy: 12/26/17	ethod pe: To zed 19:08	Blan otal/N/ Dil Fa
Total Organic Carbon <b>lethod: SM 2320B - Alkalinity</b> Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007 <u>Analyte</u> Alkalinity as CaCO3 Lab Sample ID: LCS 310-190007/2 Matrix: Water	MB Result	Qualifier			18.6		mg/L		CI	ient ( Prepa	93 Sam	ple ID: M Prep Ty  12/26/17 : Lab Cor	ethod pe: To zed 19:08	Blan otal/N/  Dil Fa
Total Organic Carbon /lethod: SM 2320B - Alkalinity Lab Sample ID: MB 310-190007/1 Matrix: Water Analysis Batch: 190007	MB Result	Qualifier	20.0		18.6	MDL	mg/L		CI	ient ( Prepa	93 Sam red	ple ID: M Prep Ty - Analy: 12/26/17 : Lab Cor Prep Ty	ethod pe: To zed 19:08	Blan otal/N/ Dil Fa

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## **QC Association Summary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

## **GC/MS VOA**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146571-6	BSA-MW-1S-1217-EB	Total/NA	Water	8260B	
680-146571-7	4Q17 Trip Blank #4	Total/NA	Water	8260B	
MB 680-506230/8	Method Blank	Total/NA	Water	8260B	
LCS 680-506230/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-506230/4	Lab Control Sample Dup	Total/NA	Water	8260B	
nalysis Batch: 5063	309				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batcl
680-146571-1	CPA-MW-2D-1217	Total/NA	Water	8260B	
680-146571-3	CPA-MW-2D-1217-AD	Total/NA	Water	8260B	
680-146571-4	BSA-MW-1S-1217	Total/NA	Water	8260B	
MB 680-506309/9	Method Blank	Total/NA	Water	8260B	
LCS 680-506309/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-506309/4	Lab Control Sample Dup	Total/NA	Water	8260B	
C VOA				И	
nalysis Batch: 506	553				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batc
680-146571-1	CPA-MW-2D-1217	Total/NA	Water	RSK-175	
MB 680-506553/12	Method Blank	Total/NA	Water	RSK-175	
LCS 680-506553/6	Lab Control Sample	Total/NA	Water	RSK-175	
LCS 680-506553/9	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-506553/10	Lab Control Sample Dup	Total/NA	Water	RSK-175	
LCSD 680-506553/7	Lab Control Sample Dup	. Total/NA	Water	RSK-175	
nalysis Batch: 506					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
MB 680-506635/42	Method Blank	Total/NA	Water	RSK-175	
LCS 680-506635/37	Lab Control Sample	Total/NA	Water	RSK-175	
LCS 680-506635/39	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-506635/38	Lab Control Sample Dup	Total/NA	Water	RSK-175	
LCSD 680-506635/40	Lab Control Sample Dup	Total/NA	Water	RSK-175	
nalysis Batch: 506	830				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batc
680-146571-1	CPA-MW-2D-1217	Total/NA	Water	RSK-175	
680-146571-4	BSA-MW-1S-1217	Total/NA	Water	RSK-175	
MB 680-506830/10	Method Blank	Total/NA	Water	RSK-175	
LCS 680-506830/3	Lab Control Sample	Total/NA	Water	RSK-175	
LCS 680-506830/7	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 680-506830/4	Lab Control Sample Dup	Total/NA	Water	RSK-175	
LCSD 680-506830/8	Lab Control Sample Dup	Total/NA	Water	RSK-175	

#### Prep Batch: 506047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146571-1	CPA-MW-2D-1217	Total Recoverable	Water	3005A	
680-146571-2	CPA-MW-2D-F(0.2)-1217	Dissolved	Water	3005A	a lui lu V

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## **QC Association Summary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

## Metals (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146571-4	BSA-MW-1S-1217	Total Recoverable	Water	3005A	•
680-146571-5	BSA-MW-1S-F(0.2)-1217	Dissolved	Water	3005A	
MB 680-506047/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-506047/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
nalysis Batch: 506	233				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batcl
680-146571-1	CPA-MW-2D-1217	Total Recoverable	Water	6010C	50604
680-146571-2	CPA-MW-2D-F(0.2)-1217	Dissolved	Water	6010C	50604
680-146571-4	BSA-MW-1S-1217	Total Recoverable	Water	6010C	50604
680-146571-5	BSA-MW-1S-F(0.2)-1217	Dissolved	Water	6010C	50604
MB 680-506047/1-A	Method Blank	Total Recoverable	Water	6010C	50604
LCS 680-506047/2-A	Lab Control Sample	Total Recoverable	Water	6010C	50604
eneral Chemist	ry				
nalysis Batch: 189	992				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
680-146571-1	CPA-MW-2D-1217	Total/NA	Water	SM 4500 CO2 C	
680-146571-4	BSA-MW-1S-1217	Total/NA	Water	SM 4500 CO2 C	
nalysis Batch: 190	007	×			
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bato
680-146571-1	CPA-MW-2D-1217	Total/NA	Water	SM 2320B	
680-146571-4	BSA-MW-1S-1217	Total/NA	Water	SM 2320B	
MB 310-190007/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-190007/2	Lab Control Sample	Total/NA	Water	SM 2320B	
nalysis Batch: 505	753				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
680-146571-1	CPA-MW-2D-1217	Total/NA	Water	353.2-1993 R2.0	
680-146571-4	BSA-MW-1S-1217	Total/NA	Water	353.2-1993 R2.0	
MB 680-505753/13	Method Blank	Total/NA	Water	353.2-1993 R2.0	
LCS 680-505753/16	Lab Control Sample	Total/NA	Water	353.2-1993 R2.0	
680-146571-4 MS	BSA-MW-1S-1217	Total/NA	Water	353.2-1993 R2.0	
680-146571-4 MSD	BSA-MW-1S-1217	Total/NA	Water	353.2-1993 R2.0	
nalysis Batch: 506					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bato
680-146571-1	CPA-MW-2D-1217	Total/NA	Water	415.1-1974	
680-146571-4	BSA-MW-1S-1217	Total/NA	Water	415.1-1974	
MB 680-506527/2	Method Blank	Total/NA	Water	415.1-1974	
LCS 680-506527/3	Lab Control Sample	Total/NA	Water	415.1-1974	
LCSD 680-506527/4	Lab Control Sample Dup	Total/NA	Water	415.1-1974	
nalysis Batch: 506					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Bate
680-146571-4	BŞA-MW-1S-1217	Total/NA	Water	325.2-1978	
MB 680-506967/17	Method Blank	Total/NA	Water	325.2-1978	
LCS 680-506967/18	Lab Control Sample	Total/NA	Water	325.2-1978	

## **QC Association Summary**

## **General Chemistry (Continued)**

Analysis	Batch:	506967	(Continued)
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Analysis Batch: 506	967 (Continued)				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 680-506967/20	Lab Control Sample Dup	Total/NA	Water	325.2-1978	
nalysis Batch: 506	968				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146571-1	CPA-MW-2D-1217	Total/NA	Water	325.2-1978	
MB 680-506968/7	Method Blank	Total/NA	Water	325.2-1978	
LCS 680-506968/8	Lab Control Sample	Total/NA	Water	325.2-1978	
LCSD 680-506968/10	Lab Control Sample Dup	Total/NA	Water	325.2-1978	
nalysis Batch: 506	969				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-146571-1	CPA-MW-2D-1217	Total/NA	Water	375.4-1978	
680-146571-4	BSA-MW-1S-1217	Total/NA	Water	375.4-1978	
MB 680-506969/4	Method Blank	Total/NA	Water	375.4-1978	
LCS 680-506969/5	Lab Control Sample	Total/NA	Water	375.4-1978	
LCSD 680-506969/7	Lab Control Sample Dup	Total/NA	Water	375.4-1978	
nalysis Batch: 511	920				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
	CPA-MW-2D-F(0.2)-1217	Dissolved	Water	415.1-1974	······································
680-146571-2					
	BSA-MW-1S-F(0.2)-1217	Dissolved	Water	415.1-1974	
680-146571-2 680-146571-5 LCS 680-511920/4	BSA-MW-1S-F(0.2)-1217 Lab Control Sample	Dissolved Dissolved	Water Water	415.1-1974 415.1-1974	

## Client Sample ID: CPA-MW-2D-1217 Date Collected: 12/07/17 09:05 Date Received: 12/08/17 09:40

Lab Sample ID: 680-146571-1

Lab Sample ID: 680-146571-2

Lab Sample ID: 680-146571-3

Lab Sample ID: 680-146571-4

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		250	506309	12/14/17 03:06	UI	TAL SAV
Total/NA	Analysis	RSK-175		1	506553	12/15/17 15:05	KAB	TAL SAV
Total/NA	Analysis	RSK-175		1	506830	12/18/17 16:57	KAB	TAL SAV
Total Recoverable	Prep	3005A			506047	12/12/17 10:44	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1	506233	12/13/17 05:49	BWR	TAL SAV
Total/NA	Analysis	325.2-1978		1	506968	12/18/17 14:16	ALG	TAL SAV
Total/NA	Analysis	353.2-1993 R2.0		1	505753	12/08/17 16:59	AMH	TAL SAV
Total/NA	Analysis	375.4-1978		5	506969	12/18/17 15:44	ALG	TAL SAV
Total/NA	Analysis	415.1-1974		1	506527	12/14/17 12:22	KLD	TAL SAV
Total/NA	Analysis	SM 2320B		1	190007	12/26/17 19:08	BER	TAL CF
Total/NA	Analysis	SM 4500 CO2 C		1	189992	12/26/17 09:54	LBB	TAL CF

#### Client Sample ID: CPA-MW-2D-F(0.2)-1217 Date Collected: 12/07/17 09:05 Date Received: 12/08/17 09:40

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			506047	12/12/17 10:44	AJR	TAL SAV
Dissolved	Analysis	6010C		1	506233	12/13/17 06:10	BWR	TAL SAV
Dissolved	Analysis	415.1-1974		1	511920	12/14/17 12:42	KLD	TAL SAV

#### Client Sample ID: CPA-MW-2D-1217-AD Date Collected: 12/07/17 09:05 Date Received: 12/08/17 09:40

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		250	506309	12/14/17 05:16	UI	TAL SAV

#### Client Sample ID: BSA-MW-1S-1217 Date Collected: 12/07/17 10:05 Date Received: 12/08/17 09:40

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		5000	506309	12/14/17 02:23	UI	TAL SAV
Total/NA	Analysis	RSK-175		1	506830	12/18/17 17:10	KAB	TAL SAV
Total Recoverable	Prep	3005A			506047	12/12/17 10:44	AJR	TAL SAV
Total Recoverable	Analysis	6010C		1	506233	12/13/17 06:05	BWR	TAL SAV
Total/NA	Analysis	325.2-1978		10	506967	12/19/17 07:43	ALG	TAL SAV
Total/NA	Analysis	353.2-1993 R2.0		1	505753	12/08/17 16:52	AMH	TAL SAV
Total/NA	Analysis	375.4-1978		2	506969	12/18/17 16:11	ALG	TAL SAV
Total/NA	Analysis	415.1-1974		1	506527	12/14/17 12:58	KLD	TAL SAV

53D 2/14/18

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## Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

Client Sample Date Collected: Date Received:	12/07/17 1						Lab Sa	ample ID:	680-146571-4 Matrix: Water
	Batch	Batch		Dilution	Batch	Prepared		an ann an	
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Analysis	SM 2320B		1	190007	12/26/17 19:08	BER	TAL CF	
Total/NA	Analysis	SM 4500 CO2 C		1	189992	12/26/17 09:58	LBB	TAL CF	
Client Sample Date Collected: Date Received:	12/07/17 1		)-1217				Lab Sa	ample ID:	680-146571-5 Matrix: Wate
-	Batch	Batch		Dilution	Batch	Prepared			
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Dissolved	Prep	3005A			506047	12/12/17 10:44	AJR	TAL SAV	
Dissolved	Analysis	6010C		1	506233	12/13/17 06:15	BWR	TAL SAV	
Dissolved	Analysis	415.1-1974		. 1	511920	12/14/17 13:15	KLD	TAL SAV	
Client Sample Date Collected: Date Received:	12/07/17 1		-EB				Lab Sa	ample ID:	680-146571-6 Matrix: Wate
95	Batch	Batch		Dilution	Batch	Prepared			
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Analysis	8260B		1	506230	12/13/17 15:48	UI	TAL SAV	
Client Sample Date Collected: Date Received:	12/07/17 0		4				Lab Sa	ample ID:	680-146571-7 Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	506230	12/13/17 16:11	UI	TAL SAV

Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Regulatory Program. Wow longer         More         Color Constant         Regulatory Program. Wow longer         More         Color Constant         Colspan="2"         Colspan="2" <th <="" colspa="2" th="" th<=""><th>TestAmerica Savannah 5102 LaRoche Avenue</th><th></th><th></th><th>Cha</th><th>in of</th><th>Cust</th><th>Chain of Custody Record</th><th>lecor</th><th>σ</th><th></th><th>TestAmerico</th></th>	<th>TestAmerica Savannah 5102 LaRoche Avenue</th> <th></th> <th></th> <th>Cha</th> <th>in of</th> <th>Cust</th> <th>Chain of Custody Record</th> <th>lecor</th> <th>σ</th> <th></th> <th>TestAmerico</th>	TestAmerica Savannah 5102 LaRoche Avenue			Cha	in of	Cust	Chain of Custody Record	lecor	σ		TestAmerico
Client Contect         Forther Manager, manual Derhade         Sense Land Standing         Sense Landing         Sense Landing<	Savannah, GA 31404 phone 912.354.7858 fax	Regulatory I	Program:	5		RCRA	Other:				TestAmerica Laboratories, Inc.	
Contract inc.	Client Contact	Project Manager:	: Amanda Derl	hake	Site	Contact:	Samantha	a DiCenso		121		
Contains. Not starter	Golder Associates Inc.	Tel/Fax: 636-724-	9191		Lat	Contact:	Michele K	ersey	Carrie	or: FedEx	of 1	
Control (Control)     Control      Control (Control)     Control      Control (Control)     Control      Contro	820 South Main Street	Analysi	s Turnaround	Time	1		7 S				Sampler: JAP	
(563) 724933     Finance     Tri interestination     Tri interestination     Tri interestination       509(32) 749(32)     E.M.     2.4835     2.4835     2.4835     2.4835       509(32) 749(32)     E.M.     2.4835     2.4835     2.411     2.411       509(32) 749(32)     E.M.     2.4835     2.411     2.411     2.411       509(32) 749(32)     E.M.     2.411     2.411     2.411     2.411       509(32) 749(32)     E.M.     2.411     2.411     2.411     2.411       509(32) 749(32)     E.M.     2.411     2.411     2.411     2.411       511     C.P.A.W1010.11     1.217     2.45     3.4     2.4     1.1     2.2     3     3       512.1.1     C.P.A.W1010.11     1.41     2.5     W2.0     1.1     2.2     3     3     1.1     2.2     3     3     1.1     2.2     3     3     1.1     2.2     3     3     1.1     2.2     3     3     1.1     1.2     2.2     3     3     1.1     2.2     3     3     1.1     1.2     2.2     3     3     1.1     2.2     3     3     1.1     1.2     1.1     2     1.1     1.2     1.2 <td< td=""><td>St. Charles, MO 63301</td><td>CALENDAR DAYS</td><td></td><td>CING DAYS</td><td></td><td></td><td>-</td><td></td><td></td><td></td><td>For Lab Use Only:</td></td<>	St. Charles, MO 63301	CALENDAR DAYS		CING DAYS			-				For Lab Use Only:	
Resolution         Event			rent from Below S	Standard		N /	-		00		Walk-in Client	
The decision states     Junk     Junk     Junk     Junk       Else Solution Flam     2 and Sample states     2 and Junk     2 and Sample states     2 and Sample states     2 and Sample states     2 and Sample states       Else Solution Solution     Sample states     3 and Sample states     2 and Sample states     2 and Sample states     2 and Sample states     2 and Sample states       Else Solution     Sample states     Sample states     2 and Sample states     2 and Sample states     2 and Sample states     2 and Sample states       Else Alue-3D - 1217     2 and Sample states     2 and Sample states     2 and Sample states     3 and Sample states     3 and Sample states     3 and Sample states       Else Alue-3D - 1217     2 and Sample states     2 and Sample states     3 and Sample states     3 and Sample states     3 and Sample states       Else Alue-3D - 1217     2 and Sample states     2 and Sample states     3 and Sample states     3 and Sample states     3 and Sample states       Else Alue-SD - 1217     2 and Sample states     3 and Sample states     3 and Sample states     3 and Sample states     3 and Sample states       Else Alue-SD - 1217     2 and Sample states     3 and Sample states     3 and Sample states     3 and Sample states     3 and Sample states       Else Alue-SD - 1217     2 and Sample states     3 and Sample states     3 and	(636) 724-9323 FAX		2 weeks						109		Lab Sampling	
Bits Soluta WG formmonth Plant     2 days     2 days     2 days       Bits Soluta WG formmonth Plant     2 manual     2 manual     2 manual     2 manual       Burnylo Identification     Sample     Sample     Sample     2 manual     2 manual       Burnylo Identification     Sample     Sample     Sample     Sample     2 manual       CiPA Muku-7D-17/1     12/17     12/17     12/17     13/1     2 days       CiPA Muku-10-12.17     AN     2 days     2 days     2 days       Schar - Muku-15<-12.17	Project Name: 4017 LTM GW Sampling-1403345		1 week				ns/a		ρλ			
D OF 4 4262633         1.04%         1.04%         1.14%         2.04%         2.04%           Sample         Sample         Sample         Sample         Sample         State         2.04%	Site: Solutia WG Krummrich Plant		2 days			0	2 52	1			Job / SDG No.	
Sample Identification         Sample Sample         Sample Identification         Sam	P O # 42262863	11	1 day			826	5 Å0	92 32				
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Sample Identification				Filtered S	AOCs pA	Chloride b	Vitrate by 4			Sample Specific Notes:	
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3:A1 - Muu - 15 - 12.1       1       1       1       1       3       1       1       3       1       1       3       1       1       3       1       1       3       1       1       3       1       1       3       1       1       3       1       1       3       1       1       3       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1       1       1       3       1 <td>-1217-</td> <td></td> <td>-</td> <td></td> <td>T</td> <td>70</td> <td>-</td> <td></td> <td>-</td> <td></td> <td></td>	-1217-		-		T	70	-		-			
$\mathbb{R}_{SA} - \mathcal{H}_{MU} -  S - F_0, 2 \rangle -  Z  \cap -  E $ $\mathbb{L}$ $\mathbb{L}$ $\mathbb{R}$ <td>F121-21-MW-15-1217</td> <td>1 1005</td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td>N</td> <td></td> <td></td> <td></td>	F121-21-MW-15-1217	1 1005					-	N				
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HAIT This     Black E at 4     L <thl< td=""><td>BSII - MW- 15-1212-</td><td>1030</td><td>4</td><td>+</td><td></td><td>3</td><td></td><td></td><td></td><td></td><td></td></thl<>	BSII - MW- 15-1212-	1030	4	+		3						
Preservation Ubers: 1= (co., 2= HCI; 3= H2SQ4; 4=HNO3; 6= Other     2     4     1     1     2     4     1     1     2     4     1     1     2     4     1     1     2     4     1     1     2     1     1     1     2     1     1     1     2     1     1     1     2     1     1     1     2     1     1     1     2     1     1     1     1     2     1     1     1     2     1     1     1     1     2     1<	4017 Tris Black #	1	3	3		7						
Preservation Used: 1= Leo., 2= HCI: 3= H2SO4; 4=HNO3; 5= Other     2     4     1     1     2     1     1     2     1     1     2     1     1     2     1     1     2     1     1     2     1     1     2     1     1     2     1     1     1     2     1     1     1     2     1     1     1     2     1 </td <td>/</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td>	/								-			
Preservation Used:     1= lee, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 5= Other     2     1     1     2     1     1       Preservation Used:     1= lee, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 5= Other     2     2     4     1     2     1,3     3     4     3     1     1       Preservation Used:     1= lee, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 5= Other     2     1     1     2     1,3     4     3     1     1       Preservation Used:     1= lee, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 5= Other     2     1     1     2     1,3     1     1       Contrast     Preservation     1= lee, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 5= Other     2     1     1     2     1     1     1     1     2     1     <									,			
Preservation Used: 1=1ca, 2= HCI: 3= H2SO4; 4=HNO3; 5=NaOH; 5= Other     2     4     1     1     2     3     3     3     4       Preservation Used: 1=1ca, 2= HCI: 3= H2SO4; 4=HNO3; 5=NaOH; 5= Other     2     4     1     1     2     3     3     3     4     3     4     1     1     2     1     3     4     3     4     1     1     2     1     1     2     1     3     4     3     4     1     1     2     1     3     4     3     4     1     1     2     1     3     4     3     1     4     1     1     2     1     3     4     3     3     4     1     1     2     1     3     4     3     3     4     1     1     2     1     3     4     3     3     4     1     1     2     1     3     3     3     3     1     1     1     3     4     1     1     2     1     3     3     1     1     1     3     3     1     1     1     3     3     1     1     1     3     3     1     1     1     3     3     1     1 <td></td> <td> </td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>												
Preservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other     2     4     1     1     2     3     4     3     4       Preservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other     2     4     1     1     2     1     1     2     1     1     1     2     3     4     3     1     3     1     3     1     3     1     3     1     3     1     3     1     3     1 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>680</td> <td>-146571 Chain of Cue</td> <td>stody</td>									680	-146571 Chain of Cue	stody	
Preservation Used: 1= los, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other     [2] [4] [1] [2] [1] [3] [4] [3] [4] [3] [4] [3]       Possible Hazardi dentification:     For any EPA Waste? Please List any EPA Waste Codes for the sample in the comments Sample to the sample.       Forments Sample to the part of the lab is to dispose of the sample.     Example Disposal (A fee may be assessed if sample Comments Sample Disposal (A fee may be assessed if sample Comments Sample to the lab is to dispose of the sample.       Externated     Entimete     Entimete     Entimete     Entimete     Entimete     Entimete       Special Instructions/OC Requirements & Comments:     Voc headspace upon sampling: Yes/No     Poston Instructions/OC Requirements & Comments:     Cooler Temp. (°C) Obs (Cooler Temp. (°C) Obs (Cooler Temp. (°C) Obs (Company)       Voc headspace upon sampling: Yes/No     Custody Seal No:     Entimete     Received by     Company       Reilinquished by     Min.     Min.     Min.     Min.     Company       Reilinquished by     Min.     Min.     Received by     Min.     Min.       Reilinquished by     Min.     Min.     Min.     Min.     Min.				1	1				_			
Peesible Hazard Identification:       Peesible Hazard Identification:       Peesible Hazard Identification:         Pressible Hazard Identification:       Pease List any EPA Waste Codes for the sample in the comments Section if the lab is to dispose of the sample.       Pease List any EPA Waste Codes for the sample in the comments Section if the lab is to dispose of the sample.         Comments Section if the lab is to dispose of the sample.       Denviruand       Return to Clean       Denviruand         Special Instructions/OC Requirements & Comments:       Voluminowin       Itelevic       Denviruand       Control of the lab is to dispose of the sample.         Voluments/COC headspace upon sampling: Yes/No       Voluments       Control of the lab is to dispose of the sample.       Denviruand       Control of the lab is to dispose of the l	HCI;	5=NaOH; 6= Other			Distribution of	2 4	1 1 2	1,3 3	4 3	1 950 820 522 880 874	the state with a comparison of the state of the state of	
Image: Contrast international contrast     Contrast international contrast     Poteon B     International contrast     Description     Description     Description       Special Instructionar/OC Requirements & Comments:     Voc headspace upon sampling: Yea/No     No     Lintroom     Image: Contrast international contrast     Description     Description     Description     Contrast       VOC headspace upon sampling: Yea/No     Image: Contrast internation     No     Contrast     Contrast     Contrast       Voc headspace upon sampling: Yea/No     Company     Company     Contrast     Contrast     Contrast       Relinquished by:     Contrast     Company     Date/Time     Received by:     Company     Company       Relinquished by:     Company     Date/Time     Received by:     Company     Company       Relinquished by:     Company     Date/Time     Received by:     Company     Company       Relinquished by:     Company     Date/Time     Received by:     Company     Company		se List any EPA Waste		sample in		ample Di	sposal (A	fee may	be asses	sed if samples are re	stained longer than 1 month)	
Special Instructions/GC Requirements & Comments:         VOC headspace upon sampling: Yes/No         Custody Seals Intact:       Yes       No         Custody Seals Intact:       Yes       No         Custody Seals Intact:       Yes       Cooler Temp. (*). Obs/d       Conf         Relinquished by:       Company:       Istantime:       Received by:       Company:         Relinquished by:       Company:       Date/Time:       Received by:       Company:         Relinquished by:       No       Date/Time:       Received by:       Company:         No       No       No       No       No         No       No       No       No       No         No       No       No       No       No       No         No       No       No       No       No       No         No       No       No       No       No       No         No       No       No	Cinon-Hazard	Polson B	Unknov	UN		Return	to Client	2	Disposal by			
Custody Seals Intact:     Yes     No     Custody Seal No::     Cooler Temp. (*C): Obsid     Conf       Relinquished by:     Date/Time:     Received by:     Received by:     Company:       Relinquished by:     Date/Time:     Received by:     Company:     Company:	Special Instructions/QC Requirements & Comments: VOC headspace upon sampling: Yes/No											
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Relinquished by Company: Date/Time: Received by: Company: Relinquished by Company: Relinquished by Company: North Company: North Company North Company: Nort	Relinquished by	Company		Date/Tim		Received b	y:			Company	Date/Time	
Company: Company: DaterTime: Received in Laboratory by: Company, $M = \int_{0}^{\infty} \int_{0}$	Relinquished by.	Company:		Date/Tim		Received t	sy:			Company:	Date/Time.	
4 ((m) n 2 3), (m) h	Relinquished by.	Company:		Date/Tim		Received I	n Laborato	ory by:		Company	117	
							2	sn(m	27	1:1	o. CA-C-WI-002, Rev. 4.3, dated 12/05/20	
							13	M	1 10	196° 00 21	2 3 4 5 6	

**TestAmerica** 

THE LEADER IN ENVIRONMENTAL TESTING



680-146571 Chain of Custody

## Cooler/Sample Receipt and Temperature Log Form

Client Information	
Client: TA- Savannah	
City/State: Surannah	Project:
Receipt Information	
Date/Time Received:   12/23/17 1005	Received By: MRH
Delivery Type: UPS X FedEx Del	FedEx Ground US Mail Spee-Dee
TA Courier TA Field Services	Client Drop-off Other:
Condition of Cooler/Containers	· · · · · · · · · · · · · · · · · · ·
Sample(s) received in Cooler? 🔣 Yes 🗌 No	If yes: Cooler ID:
Multiple Coolers? Yes X No	If yes: Cooler # of
Cooler Custody Seals Present? Yes X No bi	ر المالي المالي
Sample Custody Seals Present? 🗌 Yes 🔀 No	<i>If yes:</i> Sample custody seals intact? Yes No
Trip Blank Present? Yes X No	If yes: Which VOA samples are in cooler?
Temperature Record     Image: Im	
Thermometer ID: T	Correction Factor (°C): +0.
• Temp Blank Temperature – If no temp blank, or temp blank tem	perature above criteria, proceed to Sample Container Temperature 添
Uncorrected Temp (°C): (). 3	Corrected Temp (°C): (), 4
• Sample Container Temperature	
Sample ID(s) & bottle type used:	CCN TAINER 2
Uncorrected Temp (°C):	Corrected Temp (°C): TEMP 1 TEMP 2
Exceptions Noted	
<ol> <li>If temperature exceeds criteria, was sample(s) rece a) If yes: Is there evidence that the chilling proce</li> </ol>	
<ol> <li>If temperature is &lt;0°C, are there obvious signs that (e.g., bulging septa, broken/cracked bottles?)</li> </ol>	t the integrity of sample containers is compromised?
NOTE: If yes, contact PM before proceeding. If no, proceed w	ith login
Additional Comments	

Revision: 22 Date: 11/27/2015

TestAmerica-Cedar Falls Page 32 of 37 General temperature criteria is 0 to 6°C Bacteria temperature criteria is 0 to 10°C

TestAmerica Savannah 5102 LaRoche Avenue		Chain of Custody Record	Custod	/ Record			TestAmerico	nerica
Savannah, GA 31404 Phone (912) 354-7858 Fax (912) 352-0165						san sal katal tiber anka saa a sal matu sa sa tiber	THE LEADER IN FWN	The leader in Finnedimental Terting
Client Information (Sub Contract Lab)	Sampler			Lab PM: Kersey, Michele R		Carrier Tracking No(s);	COC No: 680-502683.1	
1 0	Phone;			E-Mail: michele.kersey@testamericainc.com		State of Origin: Illinois	Page 1 of 1	
Company: TestAmerica Laboratories, fric				Accreditations Required (See note) NELAP - Illinois	uired (See note): 3		Job #: 680-146571-1	
Address. 704 Enterprise Drive,	Due Date Requested: 12/26/2017	;pa			Analysis Req	Requested		; 1 - Hevene
City Cectar Falls State, Zp I.A. 50613	TAT Requested (d	(days):		azalatata			5 - NaOH 5 - NaOH 0 - Nime Acid 1 - NaHSO4	N - None 0 - AshinO2 P - Na2045 C - Na2045
4	PO#							- Na2S203 - H2SO4 - F2SO4
519-211-2401(181) 319-211-2420(FaX) Email:	# OM			(0)			1 - Ascorbic Acid 1 - Ice J - Di Water	- 15r Dogecanyarate - Acetane - MCAA
Project Name: WGK Long Term Monitoring (LTM)	Project # 68001754			l to sa			L-EDA	w - pH 4-5 Z - ather (spacify)
Site	#MOSS			n) as			Other r other	
Samole Identification - Cilent ID (Lab ID)	Sample Date	Sample (C. 1	Sample Matrix Type Savedo (C=comp, Carented G=grab) Brethaue, Auto	2W4200 COS C 232081 אוגייוועוני בופוס בוופיסס ( בופוס בוופיסס ( בופוס בוופיסס ( בופוס בוופיסס ( בופוס בוופיסס ( בופוס בוופיס בוופיס ( בופוס בוופיס בוופיס בוופיס ( בופוס בוופיס בוופיס בוופיס בוופיס ( בופוס בוופיס בוופיס בוופיס בוופיס בוופיס ( בוופיס בוופיס בוופי בוופיס בוופי בוופיס בוופי			Total Instr Special Instr	Special Instructions/Note:
	X		0	de: XX	Product and the pro-			
0 CPA-MW-2D-1217 (680-146571-1)	12/1/17	09:05 Central	Water	er X X			-	
CS BSA-MW-1S-1217 (680-146571-4)	12/7/17	10:05	Water	er × ×			F	
of 37								
			_					
							2.57	
Note: Since taboratory accretitations are subject to change. TourAmerica Laboratories, inc. places the ownership of method, analyte & accreditation compliance upon out supcontract taboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysts/fisted above for above for analysts/fisted above for analysts/fisted above for analysts/fisted above for	Menerice Laboratories, inc. places the e for analysistestatmatrix being analy tations are current to date, return the s	ownership of methor ced. the samples mu- igned Chain of Cust	d, amaiyte & accrec st be stripped back ody attesting to sai	Hallon compliance upon of to the TestAmerica labora d complicance to TestAme	ut subcontract laboratories. The tory or other instructions will brick the figure of the second of the time of the second of the	ils sample shipment is forwarded un a provided. Any changes to accredi	der chain-of-custody. If the tation status should be broug	laboralory does not ght to TestAmerica
				Sample Dis	posal ( A fee may be as	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)	ined longer than 1 m	onth)
Deliverable Requested: I, II, IV, Other (specify)	Primary Deliverable Rank: 2	able Rank: 2		Special Instr	Special Instructions/OC Requirements	Disposal By LabAr ents:	Archive For	Months
and the second second		Date.		Time.		Method of Shipment:		
altra (	Date Time: 7 h		18	/ Received by:	1 7 " WA in	61 10	13-11 100 C120	Company A. C
Representation of the Control of the second of the second se	F	X W R/	Company	Received by	-		(201	Company
Reinquished by:	Date/Time;		Company	Received by:	y:	Dato/Time	Ŭ	Company
Custody Seals Intact: Custody Seal No.:				Cooler Terr	Coolar Temperature(s) °C and Olher Remarks	larks.		
							>	Ver: 09/20/2016
ra dajara lanjaga ang kalang ng kan ang kapang ng kanang ng kanang ng kanang ng kanang na ng panang na na kanan	والمحافظة والمراجعة والمحاولة والمحاولة والمحاولة والمحاولة والمحاولة والمحاولة والمحاولة والمحاولة والمحافظة	والمعاوية والمحكلة المراسبة والمحاصر محاصر والمحكم المحاصر المحاصر	gran belandproved bleven movet teachers ou belander	and the second s	13		10 (a)	

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## Login Sample Receipt Checklist

Client: Solutia Inc.

#### Login Number: 146571 List Number: 1 Creator: Tyler, Matthew M

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 680-146571-1 SDG Number: KPS201

List Source: TestAmerica Savannah

## Login Sample Receipt Checklist

Client: Solutia Inc.

#### Login Number: 146571 List Number: 2 Creator: Hummel, Matt R

Job Number: 680-146571-1 SDG Number: KPS201

List Source: TestAmerica Cedar Falls
List Creation: 12/23/17 10:40 AM

Creator. Hummen, Watt K		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## **Accreditation/Certification Summary**

#### Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

15

## Laboratory: TestAmerica Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alahama	AFCEE		SAVLAB	00.00.00
Alabama	State Program	4	41450	06-30-18
Alaska	State Program	10		06-30-18
Alaska (UST)	State Program	10	UST-104	09-22-19
Arizona	State Program	9	AZ0808	12-14-18
Arkansas DEQ	State Program	6	88-0692	02-01-19
California	State Program	9	2939	06-30-18
Colorado	State Program	8	N/A	12-31-18
Connecticut	State Program	1	PH-0161	03-31-19
Florida	NELAP	4	E87052	06-30-18
GA Dept. of Agriculture	State Program	4	N/A	06-12-18
Georgia	State Program	4	803	06-30-18
Guam	State Program	9	15-005r	04-16-18
Hawaii	State Program	9	N/A	06-30-18
Illinois	NELAP	5	200022	11-30-18
Indiana	State Program	5	N/A	06-30-18
Iowa	State Program	7	353	06-30-19
Kentucky (DW)	State Program	4	90084	12-31-18
Kentucky (UST)	State Program	4	18	06-30-18
Kentucky (WW)	State Program	4	90084	12-31-18 *
L-A-B	DoD ELAP		L2463	09-22-19
L-A-B	ISO/IEC 17025		L2463.01	09-22-19
Louisiana	NELAP	6	30690	06-30-18
Louisiana (DW)	NELAP	6	LA160019	12-31-18
Maine	State Program	1	GA00006	09-24-18
Maryland	State Program	3	250	12-31-18
Massachusetts	State Program	1	M-GA006	06-30-18
Michigan	State Program	5	9925	06-30-18
Mississippi	State Program	4	N/A	06-30-18
Nebraska	State Program	7	TestAmerica-Savannah	06-30-18
New Jersey	NELAP	2	GA769	06-30-18
New Mexico	State Program	6	N/A	06-30-18
New York	NELAP	2	10842	03-31-18
North Carolina (DW)	State Program	4	13701	07-31-18
North Carolina (WW/SW)	•	4	269	
Oklahoma	State Program State Program	4 6		12-31-18
	NELAP		9984	08-31-18
Pennsylvania Puerto Rico		3	68-00474	06-30-18
	State Program	-	GA00006	12-31-18
South Carolina	State Program	4	98001 TN02061	06-30-18
Tennessee	State Program	4	TN02961	06-30-18
Texas	NELAP	6	T104704185-16-9	11-30-18
Texas	State Program	6	T104704185	06-30-18
US Fish & Wildlife	Federal		LE058448-0	07-31-18
USDA	Federal		SAV 3-04	06-14-20 *
Virginia	NELAP	3	460161	06-14-18
Washington	State Program	10	C805	06-10-18
West Virginia (DW)	State Program	3	9950C	12-31-18
West Virginia DEP	State Program	3	094	06-30-18
Wisconsin	State Program	5	999819810	08-31-18
Wyoming	State Program	8	8TMS-L	06-30-16 *

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

### **Accreditation/Certification Summary**

Client: Solutia Inc. Project/Site: 4Q17 LTM GW Sampling - 1403345

### Laboratory: TestAmerica Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	IHLAP		101044	11-01-18
Georgia	State Program	4	IA100001 (OR)	09-29-18
Illinois	NELAP	5	200024	11-29-18
lowa	State Program	7	007	12-01-17 *
Kansas	NELAP	7	E-10341	01-31-18 *
Minnesota	NELAP	5	019-999-319	12-31-18
Minnesota (Petrofund)	State Program	1	3349	08-22-18
North Dakota	State Program	8	R-186	09-29-18
Oregon	NELAP	10	IA100001	09-29-18

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Savannah SJD 2/14/18

#### APPENDIX E MICROBIAL INSIGHTS DATA PACKAGE

(On CD)



10515 Research Drive Knoxville, TN 37932 Phone: (865) 573-8188 Fax: (865) 573-8133

Client:	Golder A	a Dicenso ssociates In lain Street )	С.		Phone:		
	St. Charl	es, MO 6330	)1		Fax:		
Identifier:	008OL		Date Rec:	12/01/2017		Report Date:	02/12/2018
Client Proj	ect #:	1403345		Client Project	Name:	W.G. Kru	mmrich
Purchase (	Order #:						
Analysis R	equested	: PL	FA, Stable Is	otope Probing, S	Standar	d Bio-Trap	

**Reviewed By:** 

Jown Spen

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#### Client: Golder Associates Inc.

#### 008OL MI Project Number: Project: W.G. Krummrich 12/01/2017 Date Received: Sample Information Sample Name: BSA-MW-1S-11 BSA-MW-2D-11 BSA-MW-3D BSA-MW-4D-1 BSA-MW-5D-11 -1117 17 17 117 17 11/30/2017 11/30/2017 11/30/2017 11/30/2017 11/30/2017 Sample Date: Std. Bio-Trap Adv. Bio-Trap Std. Bio-Trap Std. Bio-Trap Std. Bio-Trap Sample Matrix: KH KH KH KH KH Analyst/Reviewer: **Biomass Concentrations** 2.39E+05 Total Biomass (cells/bead) 1.22E+05 3.15E+04 2.52E+04 1.60E+05 Community Structure (% total PLFA) Firmicutes (TerBrSats) 2.69 6.25 0.00 1.93 0.00 50.37 Proteobacteria (Monos) 80.65 29.96 45.00 84.90 Anaerobic metal reducers (BrMonos) 0.00 2.81 0.00 0.00 0.00 SRB/Actinomycetes (MidBrSats) 0.00 0.57 2.11 0.00 0.00 General (Nsats) 15.54 24.99 55.01 47.70 14.81

33.88

0.00

0.00

0.47

0.00

0.29

0.00

0.11

#### Physiological Status (Proteobacteria only)

 ······································			
Slowed Growth	0.20	0.71	0.92
Decreased Permeability	0.00	0.10	0.00

0.56

#### Legend:

NA = Not Analyzed NS = Not Sampled

Eukaryotes (polyenoics)



Project:

W.G. Krummrich

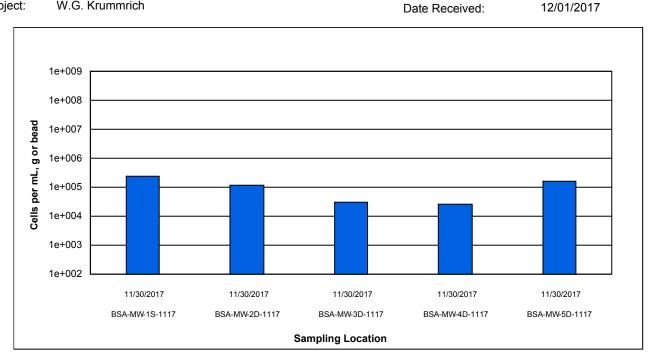


Figure 1. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass

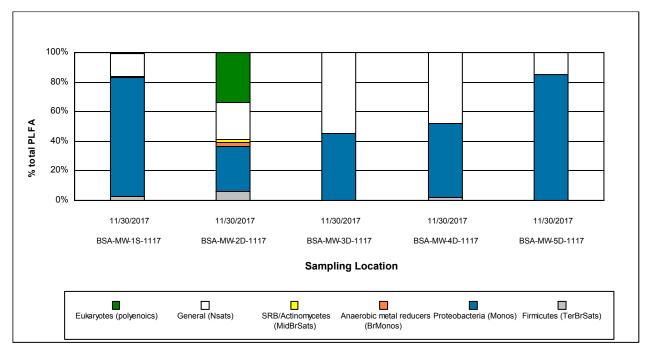


Figure 2. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis.

008OL

**MI Project Number:** 

#### **Client:** Golder Associates Inc.

#### MI Project Number: 008OL Project: W.G. Krummrich Date Received: 12/01/2017 Sample Information CPA-MW-4D-1 CPA-MW-5D-1 CPA-MW-1D-11 CPA-MW-2D-11 CPA-MW-3D Sample Name: 17 -1117 117 17 117 11/30/2017 11/30/2017 11/30/2017 11/30/2017 11/30/2017 Sample Date: Std. Bio-Trap Std. Bio-Trap Adv. Bio-Trap Std. Bio-Trap Std. Bio-Trap Sample Matrix: KH KH KH KH KH Analyst/Reviewer: **Biomass Concentrations** Total Biomass (cells/bead) 1.17E+05 7.45E+04 4.56E+05 2.06E+05 2.78E+04 Community Structure (% total PLEA)

Community Structure (% total PLFA)					
Firmicutes (TerBrSats)	0.72	13.24	17.06	12.44	19.33
Proteobacteria (Monos)	79.51	44.13	27.47	54.94	55.50
Anaerobic metal reducers (BrMonos)	0.00	0.00	0.94	0.00	0.00
SRB/Actinomycetes (MidBrSats)	0.00	1.43	2.69	3.68	0.00
General (Nsats)	19.39	35.56	46.61	20.12	25.18
Eukaryotes (polyenoics)	0.38	5.67	5.25	8.81	0.00
Physiological Status (Proteobacteria only)					
Slowed Growth	0.94	1.56	1.49	1.79	1.09
Decreased Permeability	0.04	0.00	0.13	0.30	0.00

#### Legend:

NA = Not Analyzed NS = Not Sampled

Project:

es Inc. W.G. Krummrich

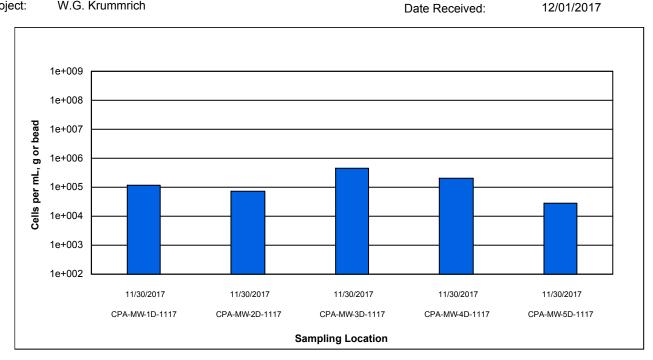


Figure 1. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass

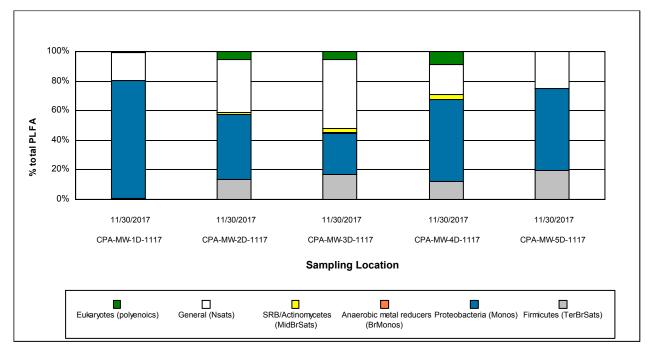


Figure 2. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis.

008OL

**MI Project Number:** 

### **Quality Assurance/Quality Control Data**

Samples Received	12/1/2017		Arrival	Positive	Extraction	Negative
Component	Date Prepared	Date Analyzed	Temperature	Control	Blank	Control
PLFA	12/01/2017	02/12/2018	13 °C	64%	non-detect	non-detect
PLFA	12/01/2017	02/12/2018	13 °C	80%	non-detect	non-detect



10515 Research Drive Knoxville, TN 37932 Phone: (865) 573-8188 Fax: (865) 573-8133

Identifier: 008OL		Date Rec: 12/01/2017	Report Date: 02/12/2018
Client Project #:	1403345	Client Project Name: W.G. Krummrich	
Purchase Order #	:		
Comments:			W-3D-1117, BSA-MW-4D-1117 and ng and detection limits for PLFA analysis.



### Phospholipid Fatty Acid Analysis

#### **Interpretation Guidelines**

Phospholipids fatty acids (PLFA) are a main component of the membrane (essentially the "skin") of microbes and provide a powerful tool for assessing microbial responses to changes in their environment. This type of analysis provides direct information for assessing and monitoring sites where bioremediation processes, including natural attenuation, are of interest. Analysis of the types and amount of PLFA provides a broad based understanding of the entire microbial community with information obtained in three key areas viable biomass, community structure and metabolic activity.

#### What is the detection limit for PLFA?

Our limit of detection for PLFA analysis is ~150 picomoles of total PLFA and our limit of quantification is ~500 picomoles of total PLFA. Samples which contain PLFA amounts at or below 150 pmol cannot be used to determine biomass, likewise samples with PLFA content below ~500 pmol are generally considered to contain too few fatty acids to discuss community composition.

#### How should I interpret the PLFA results?

Interpreting the results obtained from PLFA analysis can be somewhat difficult, so this document was designed to provide a technical guideline. For convenience, this guideline has been divided into the three key areas.

#### Viable Biomass

PLFA analysis is one of the most reliable and accurate methods available for the determination of viable microbial biomass. Phospholipids break down rapidly upon cell death (21, 23), so biomass calculations based on PLFA content do not contain 'fossil' lipids of dead cells.

#### How is biomass measured?

Viable biomass is determined from the total amount of PLFA detected in a given sample. Since, phospholipids are an essential part of intact cell membranes they provide an accurate measure of viable cells.

#### How is biomass calculated?

Biomass levels are reported as cells per gram, mL or bead, and are calculated using a conversion factor of 20,000 cells/pmole of PLFA. This conversation factor is based upon cells grown in laboratory media, and varies somewhat with the type of organism and environmental conditions.

#### What does the concentration of biomass mean?

The overall abundance of microbes within a given sample is often used as an indicator of the potential for bioremediation to occur, but understanding the levels of biomass within each sample can be cumbersome. The following are benchmarks that can be used to understand whether the biomass levels are low, moderate or high.

Low	Moderate	High
10 <sup>3</sup> to 10 <sup>4</sup> cells	10 <sup>5</sup> to 10 <sup>6</sup> cells	10 <sup>7</sup> to 10 <sup>8</sup> cells

#### How do I know if a change in biomass is significant?

One of the primary functions of using PLFA analysis at contaminated sites is to evaluate how a community responds following a given treatment, but how does one know if the changes observed between two events are significant? As a general rule, biomass levels which increase or decrease by at least an order of magnitude are considered to be significant. However, changes in biomass levels of less than an order of magnitude may still show a trend. It is important to remember that many factors can affect microbial growth, so factors other than the treatment could be influencing the changes observed between sampling events. Some of the factors to consider are: temperature, moisture, pH, etc. The following illustration depicts three types of changes that occurred over time and the conclusions that could be drawn.

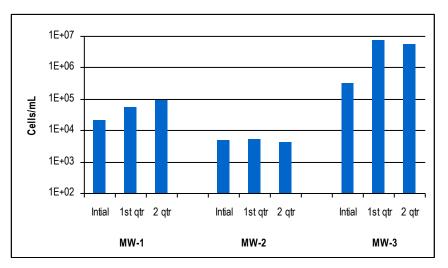


Figure 1. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass (associated with higher organisms).

#### Conclusions from graph above:

- MW-1 showed a trend of biomass levels increasing steadily over time, although cell concentrations were ~10<sup>4</sup> cells/mL at each sampling event.
- MW-2 showed no notable trends or significant changes in biomass concentrations.
- MW-3 showed a significant increase in biomass levels between the initial and 1<sup>st</sup> quarter sampling events (from ~10<sup>5</sup> to ~10<sup>6</sup> cells/mL).

#### **Community Structure:**

The PLFA in a sample can be separated into particular types, and the resulting PLFA "profile" reflects the proportions of the categories of organisms present in the sample. Because groups of bacteria differ in their metabolic capabilities, determining which bacterial groups are present and their relative distributions within the community can provide information on what metabolic processes are occurring at that location. This in turn can also provide information on the subsurface conditions (i.e oxidation/reduction status, etc.). Table 1 describes the six major structural groups used and their potential relevance to site specific projects.

PLFA Structural Group	General classification	Potential Relevance to Bioremediation Studies
Monoenoic (Monos)	Abundant in Proteobacteria (Gram negative bacteria), typically fast growing, utilize many carbon sources, and adapt quickly to a variety of environments.	Proteobacteria is one of the largest groups of bacteria and represents a wide variety of both aerobes and anaerobes. The majority of Hydrocarbon utilizing bacteria fall within the Proteobacteria
Terminally Branched Saturated (TerBrSats)	Characteristic of Firmicutes (Low G+C Gram-positive bacteria), and also found in Bacteriodes, and some Gram-negative bacteria (especially anaerobes).	Firmicutes are indicative of presence of anaerobic fermenting bacteria (mainly <i>Clostridia/Bacteriodes</i> -like), which produce the H <sub>2</sub> necessary for reductive dechlorination
Branched Monoenoic (BrMonos)	Found in the cell membranes of micro-aerophiles and anaerobes, such as sulfate- or iron-reducing bacteria	In contaminated environments high proportions are often associated with anaerobic sulfate and iron reducing bacteria
Mid-Chain Branched Saturated (MidBrSats)	Common in sulfate reducing bacteria and also Actinobacteria (High G+C Gram-positive bacteria).	In contaminated environments high proportions are often associated with anaerobic sulfate and iron reducing bacteria
Normal Saturated (Nsats)	Found in all organisms.	High proportions often indicate less diverse populations.
Polyenoic	Found in eukaryotes such as fungi, protozoa, algae, higher plants, and animals.	Eukaryotic scavengers will often rise up and prey on contaminant utilizing bacteria

 Table 1. Description of PLFA structural groups.

Following are answers to some of the common questions about community composition and some detailed descriptions of some typical shifts which can be observed between sampling events.

#### How is the community structure data presented?

Community structure data is presented as percentage (%) of the total amount of PLFA. In order to relate the complex mixture of PLFA to the organisms present, the ratio of a specific PLFA group is determined (detailed in Table 1 above), and this corresponds to the proportion of the related bacterial classification within the overall community structure. Because normal saturated PLFA are found in both prokaryotes (bacteria) and eukaryotes (fungi, protozoa, diatoms etc), their distribution provides little insight into the types of microbes that are present at a sampling location. However, high proportions of normal saturates are often associated with less diverse microbial populations.

#### How can community structure data be used to manage my site?

It is important to understand that microbial communities are often a mixture of different types of bacteria (e.g. aerobes, sulfate reducers, methanogens, etc) with the abundance of each group behaving like a seesaw, i.e. as the population of one group increases, another is likely decreasing, mostly due to competition for available resources. The PLFA profile of a sample provides a "fingerprint" of the microbial community, showing relative proportions of the specific bacterial types at the time of sampling. This is a great tool for detecting shifts within the community over time and also to evaluate similarities/differences between sampling locations. It is important to note that PLFA analysis of community structure is analyzing the microbes directly, not just secondary breakdown products. So this provides evidence of how the entire microbial community is responding to the treatment.

#### How do I recognize community shifts and what they mean?

Shifts in the community structure are indications of changing conditions and their effect on the microbial community, and, by extension on the metabolic processes occurring at the sampling location. Some of the more commonly seen shifts within the community are illustrated and discussed below:

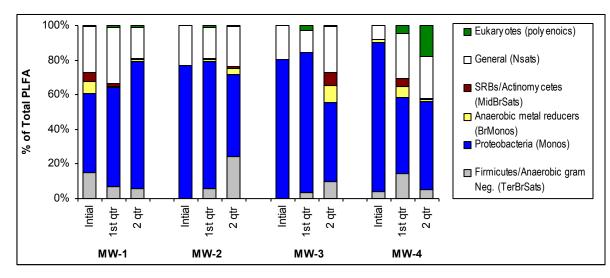


Figure 2. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis. See Table 1 for detailed descriptions of structural groups.

#### Increased Proteobacteria

Proportions of Proteobacteria are of interest because it is one of the largest groups of bacteria and represents a wide variety of both aerobe and anaerobes. The majority of hydrocarbons (including benzene and naphthalene) are metabolized by some member of Proteobacteria, mainly due to their ability to grow opportunistically, quickly taking advantage of available food (i.e. hydrocarbons), and adapting quickly to changes in the environment. The detection of increased proportions of Proteobacteria coupled with increased biomass suggests that the Proteobacteria are consuming something. In situations where it is important to determine the extent to which the Proteobacteria are utilizing anaerobic or aerobic pathways, it is possible to measure relative proportions of specific biomarkers that are associated with anaerobic or aerobic pathways thus separating the Proteobacteria into different groups, based on pathways used. Sample MW-1 from Figure 2 depicts a shift in community structure where the proportion of Proteobacteria has increased over time.

#### • Increased Firmicutes/Anaerobic Gram negative bacteria

Increased proportions of Firmicutes/Anaerobic Gram negative bacteria generally indicate that conditions are becoming more reductive (i.e. more anaerobic). Proportions of Firmicutes are of particular interest in sites contaminated with chlorinated hydrocarbons because Firmicutes include anaerobic fermenting bacteria (mainly *Clostridia/Bacteriodes*-like), which produce the H<sub>2</sub> necessary for reductive dechlorination.

Enhanced bioremediation of chlorinated solvents often employs the injection of fermentable substrates which, when utilized by fermenting bacteria, results in the release of  $H_2$ . Engineered shifts in the microbial community can be shown by observing increased proportions Firmicutes following an injection of fermentable substrate. Through long-term monitoring of the community structure it is possible to know when re-injection may be necessary or desirable. Sample MW-2 from Figure 2 depicts a shift in community structure where the proportion of Firmicutes has increased over time.

#### • Increased anaerobic metal reducing bacteria (BrMonos) and SRB/Actinomycetes (MidBrSats)

An increase in the proportions of metal and sulfate reducing bacterial groups, especially when combined with shifts in the other bacterial groups, can provide information helpful to monitoring bioremediation. Generally, an increase in metal and sulfate reducers points to more reduced (anaerobic) conditions at the sampled location. This is especially true if there is an increase in Firmicutes at the same time. Large increases in either metal and sulfate reducers, particularly if accompanied by a decrease in Firmicutes, may suggest that conditions are becoming increasingly reduced. In this situation the metal and sulfate reducers may be out-competing dechlorinators for available H<sub>2</sub>, thereby limiting the potential for reductive dechlorination at that location. Sample MW-3 from Figure 2 depicts a shift in community structure where the proportion of metal reducing bacteria has increased over time.

#### • Increased Eukaryotes

Eukaryotes include organisms such as fungi, protozoa, and diatoms. At a contaminated location, an increase in eukaryotes, particularly if seen with a decrease in the contaminant utilizing bacteria, suggests that eukaryotic scavengers are preying upon what had been an abundance of bacteria which were consuming the contaminant. Sample MW-4 from Figure 2 depicts a shift in community structure where the proportion of eukaryotes has increased over time.

#### Physiological status of Proteobacteria

The membrane of a microbe adapts to the changing conditions of its environment, and these changes are reflected in the PLFA. Toxic compounds or environmental conditions may disrupt the membrane and some bacteria respond by making *trans* fatty acids instead of the usual *cis* fatty acids (7) in order to strengthen the cell membrane, making it less permeable. Many Proteobacteria respond to lack of available substrate or to highly toxic conditions by making cyclopropyl (7) or mid-chain branched fatty acids (20) which point to less energy expenditure and a slowed growth rate. The physiological status ratios for Decreased Permeability (trans/cis ratio) and for Slowed Growth (cy/cis ratio) are based on dividing the amount of the fatty acid induced by environmental conditions by the amount of its biosynthetic precursor.

#### What does slowed growth or decreased permeability mean?

Ratios for slowed growth and for decreased permeability of the cell membrane provide information on the "health" of the Gram negative community, that is, how this population is responding to the conditions present in the environment. It should be noted that one must be cautious when interpreting these measures from only one sampling event. The most effective way to use the physiological status indicators is in long term monitoring and comparing how these ratios increase/decrease over time.

A marked increase in either of these ratios suggests a change in environment which is less favorable to the Gram negative Proteobacteria population. The ratio for slowed growth is a relative measure, and does not directly correspond to log or stationary phases of growth, but is useful as a comparison of growth rates among sampling locations and also over time. An increase in this ratio (i.e. slower growth rate) suggests a change in conditions which is not as supportive of rapid, "healthy" growth of the Gram negative population, often due to reduced available substrate (food). A larger ratio for decreased permeability suggests that the environment has become more toxic to the Gram negative population, requiring energy expenditure to produce *trans* fatty acids in order to make the membrane more rigid.

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# **SITE LOGIC Report**

Stable Isotope Probing (SIP) Study

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Project: WG Krummrich, 140-3345

**Comments:** 

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## **Executive Summary**

A Stable Isotope Probing (SIP) study was performed to determine whether biodegradation of benzene and chlorobenzene is occurring under existing site conditions. Bio-Trap® samplers baited with <sup>13</sup>C labeled benzene and <sup>13</sup>C labeled chlorobenzene were deployed in monitoring wells BSA-MW-2D-1117 and CPA-MW-3D-1117, respectively. Following a 29-day deployment period, the Bio-Traps were recovered to quantify <sup>13</sup>C incorporation into biomass and dissolved inorganic carbon (DIC). A complete summary of the SIP results is provided in Table 1 and Figures 1 through 5. Tables 2 and 3 and Figures 6 through 9 contain summaries of PLFA analysis performed on standard Bio-Trap samplers deployed in BSA and CPA monitoring wells.

#### Stable Isotope Probing (SIP)

- The detection of <sup>13</sup>C-enriched biomass confirmed that benzene biodegradation had occurred at BSA-MW-2D-1117 during the deployment period.
  - o Total PLFA biomass for well BSA-MW-2D-1117 (1.22E+05 cells/bead) was in the moderate range.
  - ο The average PLFA  $\delta^{13}$ C value was 2087‰, indicating a high level of incorporation of  $^{13}$ C-labeled benzene into microbial biomass.
  - ο The average DIC  $\delta^{13}$ C value was 175‰, indicating that moderate benzene mineralization occurred during the deployment period.
  - The PLFA community structure was primarily composed of eukaryotes (33.88%), monoenoics (29.96%), and normal saturates (24.99%). Indicators of firmicutes, anaerobic metal reducers, and actinomycetes were also detected.
- The detection of <sup>13</sup>C-enriched biomass confirmed that chlorobenzene biodegradation had occurred at CPA-MW-3D-1117 during the deployment period.
  - Total PLFA biomass for well CPA-MW-3D-1117 (4.56+05 cells/bead) was in the moderate range.
  - ο The average PLFA  $\delta^{13}$ C value was 54‰, indicating some  $^{13}$ C-labeled chlorobenzene had been metabolized and incorporated into microbial biomass.
  - ο The average DIC  $\delta^{13}$ C value was -11‰, which is near background and suggests that little to no chlorobenzene mineralization occurred during the deployment period.
  - The PLFA community structure was primarily composed of normal saturates (46.61%) and monoenoics (27.47%) followed by firmicutes (17.06%). Indicators of eukaryotes, actinomycetes, and anaerobic metal reducers were also detected.

#### PLFA Analysis - Standard Bio-Traps

- Total biomass concentrations in the standard BSA bio-traps fell within the low to moderate range (10<sup>4</sup> to 10<sup>5</sup> cells/bead). Results for samples BSA-MW-3D-1117 and BSA-MW-4D-1117 fell between reporting and detection limits for PLFA analysis.
- The community structures in the standard BSA bio-traps indicated that monoenoics and normal saturates were the most abundant groups.
- In the CPA wells, total PLFA biomass concentrations fell within fell within the low to moderate range (10<sup>4</sup> to 10<sup>5</sup> cells/bead). Total biomass in CPA-MW-5D-1117 fell between the reporting and detection limits for PLFA.
- The community structures in the standard CPA bio-traps were primarily composed of monoenoics, normal saturates, and firmicutes.



## Overview of Approach

#### Stable Isotope Probing (SIP)

Stable isotope probing (SIP) is an innovative method to track the environmental fate of a "labeled" contaminant of concern to unambiguously demonstrate biodegradation. Two stable carbon isotopes exist in nature – carbon 12 (<sup>12</sup>C) which accounts for 99% of carbon and carbon 13 (<sup>13</sup>C) which is considerably less abundant (~1%). With the SIP method, the Bio-Trap® sampler is baited with a specially synthesized form of the contaminant containing <sup>13</sup>C labeled carbon. Since <sup>13</sup>C is rare, the labeled compound can be readily differentiated from the contaminants present at the site. Following deployment, the Bio-Trap® is recovered and three approaches are used to conclusively demonstrate biodegradation of the contaminant of concern.

- The loss of the labeled compound provides an estimate of the degradation rate (% loss of <sup>13</sup>C).
- Quantification of <sup>13</sup>C enriched phospholipid fatty acids (PLFA) indicates incorporation into microbial biomass.
- Quantification of <sup>13</sup>C enriched dissolved inorganic carbon (DIC) indicates contaminant mineralization.

#### **Phospholipid Fatty Acids (PLFA)**

PLFA are a primary component of the membrane of all living cells including bacteria. PLFA decomposes rapidly upon cell death (1, 2), so the total amount of PLFA present in a sample is indicative of the viable biomass. When combined with stable isotope probing (SIP), incorporation of <sup>13</sup>C into PLFA is a conclusive indicator of biodegradation.

Some organisms produce "signature" types of PLFA allowing quantification of important microbial functional groups (e.g. iron reducers, sulfate reducers, or fermenters). The relative proportions of the groups of PLFA provide a "fingerprint" of the microbial community. In addition, *Proteobacteria* modify specific PLFA during periods of slow growth or in response to environmental stress providing an index of their health and metabolic activity.



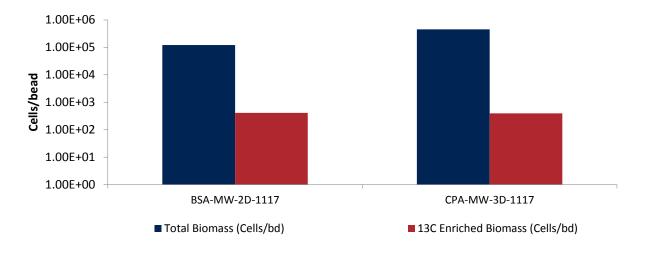
## Results

**Table 1.** Summary of the results obtained from the Bio-Trap® Units. Interpretation guidelines and definitions are found later in the document.

Sample Name	BSA-MW-2D-1117	CPA-MW-3D-1117
Sample Date	11/30/17	11/30/17
<sup>13</sup> C Contaminant Loss		
<sup>13</sup> C Benzene Pre-deployment (µg/bead)	116 ± 20	
<sup>13</sup> C Benzene Post-deployment ( $\mu$ g/bead)	99 ± 14	
<sup>13</sup> C Chlorobenzene Pre-deployment (µg/bead)		<b>219 ± 11</b>
<sup>13</sup> C Chlorobenzene Post-deployment (µg/bead)		$165 \pm 26$
Biomass & <sup>13</sup> C Incorporation		
Total Biomass (Cells/bead)	1.22E+05	4.56E+05
<sup>13</sup> C Enriched Biomass (Cells/bead)	4.11E+02	3.97E+02
Average PLFA Delta (‰)	2087	54
Maximum PLFA Delta (‰)	2087	54
<sup>13</sup> C Mineralization		
DIC Delta (‰)	175	-11
% <sup>13</sup> C	1.1	1.8
Community Structure (% total PLFA)		
Firmicutes (TerBrSats)	6.25	17.06
Proteobacteria (Monos)	29.96	27.47
Anaerobic metal reducers (BrMonos)	2.81	0.94
Actinomycetes (MidBrSats)	2.11	2.69
General (Nsats)	24.99	46.61
Eukaryotes (Polyenoics)	33.88	5.25
Physiological Status (Proteobacteria only)		
Slowed Growth	0.71	1.49
Decreased Permeability	0.10	0.13

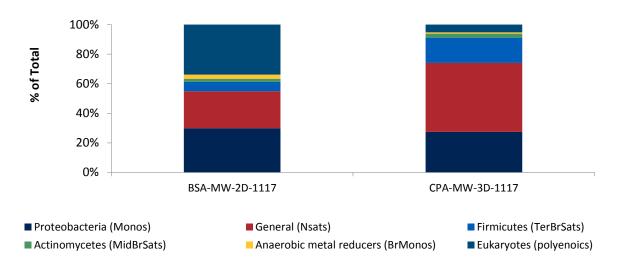
**Legend:** ND= Non Detect J = Estimated value between detection limit and reporting limit





Total & <sup>13</sup>C Enriched Biomass

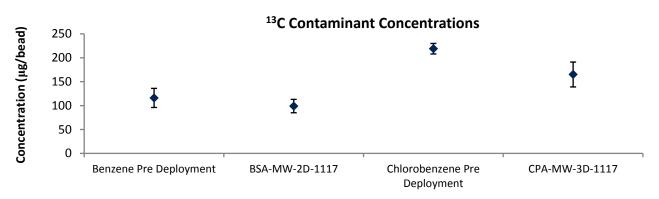
**Figure 1.** Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass (associated with higher organisms).



#### **Community Structure**

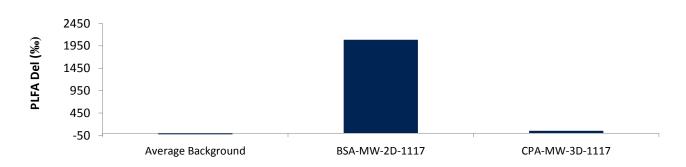
**Figure 2.** Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis. See the table in the interpretation section for detailed descriptions of the structural groups.



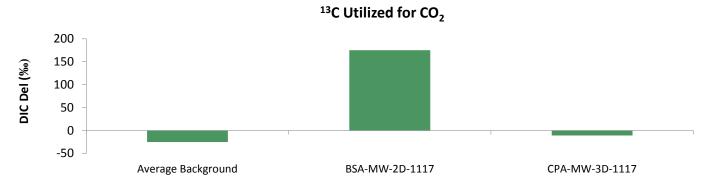


**Figure 3.** Comparison of Pre-deployment concentrations loaded on Bio-Sep beads to the concentrations detected after incubation.

<sup>13</sup>C Utilized for Biomass



**Figure 4.** Comparison of the average Delta value obtained from PLFA biomarkers from each Bio-Trap® unit to the average background Delta observed in samples not exposed to <sup>13</sup>C enriched compounds.



**Figure 5.** Comparison of the Delta value obtained from DIC from each Bio-Trap® unit to the average background Delta observed in samples not exposed to <sup>13</sup>C enriched compounds.



Sample Name	BSA-MW-1S	BSA-MW-2D	BSA-MW-3D	BSA-MW-4D	BSA-MW-5D
Sample Date	11-30-17	11-30-17	11-30-17	11-30-17	11-30-17
Biomass Concentration					
Total Biomass (Cells/bead)	2.39E+05	1.22E+05	3.15E+04 (J)	2.52E+04 (J)	1.60E+05
Community Structure (% total PLFA)					
Firmicutes (TerBrSats)	2.69	6.25	0.00	1.93	0.00
Proteobacteria (Monos)	80.65	29.96	45.00	50.37	84.90
Anaerobic metal reducers (BrMonos)	0.00	2.81	0.00	0.00	0.00
Actinomycetes (MidBrSats)	0.57	2.11	0.00	0.00	0.00
General (Nsats)	15.54	24.99	55.01	47.70	14.81
Eukaryotes (Polyenoics)	0.56	33.88	0.00	0.00	0.29
Physiological Status (Proteobacteria only)					
Slowed Growth	0.20	0.71	0.92	0.47	0.00
Decreased Permeability	0.00	0.10	0.00	0.00	0.11

Table 2. Summary of the PLFA results for the benzene wells obtained from the Bio-Trap® Units.

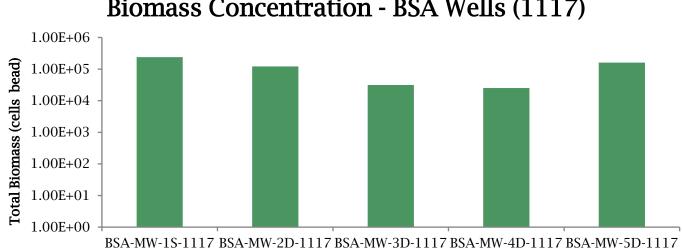
**Legend:** ND= Non Detect J = Estimated value between detection limit and reporting limit

Table 3. Summary of the PLFA results for the chlorobenzene wells obtained from the Bio-Trap® Units.

Sample Name	CPA-MW-1D	CPA-MW-2D	CPA-MW-3D	CPA-MW-4D	CPA-MW-5D
Sample Date	11-30-17	11-30-17	11-30-17	11-30-17	11-30-17
Biomass Concentration					
Total Biomass (Cells/bead)	1.17E+05	7.45E+04	4.56E+05	2.06E+05	2.78E+04 (J)
Community Structure (% total PLFA)					
Firmicutes (TerBrSats)	0.72	13.24	17.06	12.44	19.33
Proteobacteria (Monos)	79.51	44.13	27.47	54.94	55.50
Anaerobic metal reducers (BrMonos)	0.00	0.00	0.94	0.00	0.00
Actinomycetes (MidBrSats)	0.00	1.43	2.69	3.68	0.00
General (Nsats)	19.39	35.56	46.61	20.12	25.18
Eukaryotes (Polyenoics)	0.38	5.67	5.25	8.81	0.00
Physiological Status (Proteobacteria only)					
Slowed Growth	0.94	1.56	1.49	1.79	1.09
Decreased Permeability	0.04	0.00	0.13	0.30	0.00

**Legend:** ND= Non Detect J = Estimated value between detection limit and reporting limit





**Biomass Concentration - BSA Wells (1117)** 

Figure 6. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass (associated with higher organisms).

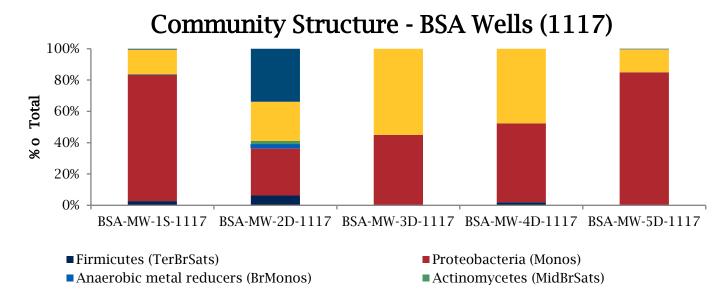


Figure 7. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis. See the table in the interpretation section for detailed descriptions of the structural groups.

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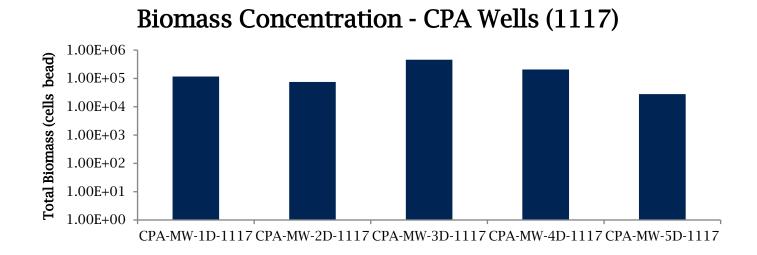
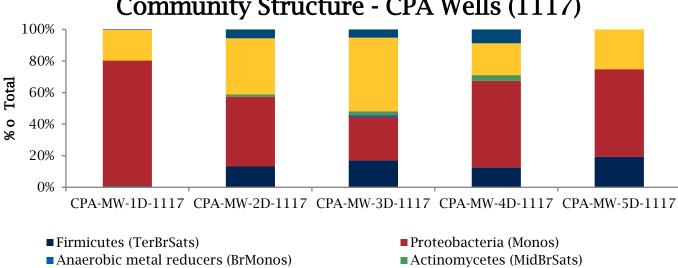


Figure 8. Biomass content is presented as a cell equivalent based on the total amount of phospholipid fatty acids (PLFA) extracted from a given sample. Total biomass is calculated based upon PLFA attributed to bacterial and eukaryotic biomass (associated with higher organisms).



Community Structure - CPA Wells (1117)

Figure 9. Relative percentages of total PLFA structural groups in the samples analyzed. Structural groups are assigned according to PLFA chemical structure, which is related to fatty acid biosynthesis. See the table in the interpretation section for detailed descriptions of the structural groups.



### Interpretation

Interpretation of the results of the SIP Bio-Trap® study must be performed with due consideration of site conditions, site activities, and the desired treatment mechanism. The following discussion describes interpretation of results in general terms and is meant to serve as a guide.

**Contaminant Concentration:** Bio-Traps<sup>®</sup> are baited with a <sup>13</sup>C labeled contaminant of concern and a pre-deployment concentration is determined prior to shipping. Following deployment, Bio-Traps<sup>®</sup> are recovered for analysis including measurement of the concentration of the <sup>13</sup>C labeled contaminant remaining. Pre- and post-deployment concentrations are used to calculate percent loss.

**Biomass Concentrations:** PLFA analysis is one of the most reliable and accurate methods available for the determination of viable (live) biomass. Phospholipids break down rapidly upon cell death, so biomass calculations based on PLFA content do not include "fossil" lipids from dead cells. Total biomass (cells/bead) is calculated from total PLFA using a conversion factor of 20,000 cells/pmole of PLFA. When making comparisons between wells, treatments, or over time, differences of one order of magnitude or more are considered significant.

	<b>Total Biomass</b>	
Low	Moderate	High
$10^3$ to $10^4$ cells	$10^5$ to $10^6$ cells	$10^7$ to $10^8$ cells

For SIP studies, the <sup>13</sup>C enriched PLFA is also determined to conclusively demonstrate contaminant biodegradation and quantify incorporation into biomass as a result of the <sup>13</sup>C being used for cellular growth. The % <sup>13</sup>C incorporation (<sup>13</sup>C enriched biomass/total biomass) is also provided in the data summary table, but the value must be interpreted carefully especially when comparing wells or treatments. Typically, biodegradation of a contaminant of concern is performed by a small subset of the total microbial community. For Bio-Traps® with large total biomass, the % <sup>13</sup>C incorporation value could be low despite significant <sup>13</sup>C labeled biomass and loss of the compound. The % <sup>13</sup>C incorporation should be viewed in light of total biomass, percent loss, and dissolved inorganic carbon (DIC) results.

<sup>13</sup>C enrichment data is often reported as a delta value. The delta value is the difference between the isotopic ratio ( $^{13}C/^{12}C$ ) of the sample (R<sub>x</sub>) and a standard (R<sub>std</sub>) normalized to the isotopic ratio of the standard (R<sub>std</sub>) and multiplied by 1,000 (units are parts per thousand, denoted ‰).

 $R_{std}$  is the naturally occurring isotopic ratio and is approximately 0.011180 (roughly 1% of naturally occurring carbon is  ${}^{13}C$ ). The isotopic ratio,  $R_x$ , of PLFA is typically less than the  $R_{std}$  under natural conditions, resulting in a delta value between -20 and -30%. For a SIP Bio-Trap® study, biodegradation and incorporation of the  ${}^{13}C$  labeled compound into PLFA results in a larger  ${}^{13}C/{}^{12}C$  ratio ( $R_x$ ) and thus delta values greater than under natural conditions. Typical PLFA delta values are provided below.

PLFA Delta (‰)		
Low	Moderate	High
0 to 100	100 to 1,000	>1,000



**Dissolved Inorganic Carbon (DIC):** Often, bacteria can utilize the <sup>13</sup>C labeled compound as both a carbon and energy source. The <sup>13</sup>C portion used as a carbon source for growth can be incorporated into PLFA as discussed above, while the <sup>13</sup>C used for energy is oxidized to <sup>13</sup>CO<sub>2</sub> (mineralized).

<sup>13</sup>C enriched CO<sub>2</sub> data is often reported as a delta value as described above for PLFA. Under natural conditions, the  $R_x$  of CO<sub>2</sub> is approximately the same as  $R_{std}$  (0.01118 or about 1.1% <sup>13</sup>C). For an SIP Bio-Trap® study, mineralization of the <sup>13</sup>C labeled contaminant of concern would lead to a greater value of  $R_x$  (increased <sup>13</sup>CO<sub>2</sub> production) and thus a positive delta value. As with PLFA, delta values between 0 and 100‰ are considered low, values between 100 and 1,000‰ are considered moderate, and values greater than 1,000‰ are considered high. Thus DIC %<sup>13</sup>C are considered low if the value is less than 1.23%, moderate if between 1.23 and 2.24%, and high if greater than 2.24%.

Dissolved Inorganic Carbon (DIC) Delta and % <sup>13</sup> C			
Low	Moderate	High	
0 to 100	100 to 1,000	>1,000	
1.11 to 1.23%	1.23 to 2.24%	>2.24%	

**Community Structure (% total PLFA):** Community structure data is presented as a percentage of PLFA structural groups normalized to the total PLFA biomass. The relative proportions of the PLFA structural groups provide a "fingerprint" of the types of microbial groups (e.g. anaerobes, sulfate reducers, etc.) present and therefore offer insight into the dominant metabolic processes occurring at the sample location. Thorough interpretation of the PLFA structural groups depends in part on an understanding of site conditions and the desired microbial biodegradation pathways. For example, an increase in mid chain branched saturated PLFA (MidBrSats), indicative of sulfate reducing bacteria (SRB) and *Actinomycetes*, may be desirable at a site where anaerobic BTEX biodegradation is the treatment mechanism, but would not be desirable for a corrective action promoting aerobic BTEX or MTBE biodegradation. The following table provides a brief summary of each PLFA structural group and its potential relevance to bioremediation.

Table 2.         Description of PL	FA structural groups.	
PLFA Structural Group	General classification	Potential Relevance to Bioremediation Studies
Monoenoic (Monos)	Abundant in Proteobacteria (Gram negative bacteria), typically fast growing, utilize many carbon sources, and adapt quickly to a variety of environments.	Proteobacteria is one of the largest groups of bacteria and represents a wide variety of both aerobes and anaerobes. The majority of Hydrocarbon utilizing bacteria fall within the Proteobacteria
Terminally Branched Saturated (TerBrSats)	Characteristic of Firmicutes (Low G+C Gram- positive bacteria), and also found in Bacteriodes, and some Gram-negative bacteria (especially anaerobes).	Firmicutes are indicative of presence of anaerobic fermenting bacteria (mainly <i>Clostridia/Bacteriodes</i> -like), which produce the H <sub>2</sub> necessary for reductive dechlorination
Branched Monoenoic (BrMonos)	Found in the cell membranes of micro-aerophiles and anaerobes, such as sulfate- or iron-reducing bacteria	In contaminated environments high proportions are often associated with anaerobic sulfate and iron reducing bacteria
Mid-Chain Branched Saturated (MidBrSats)	Common in sulfate reducing bacteria and also Actinobacteria (High G+C Gram-positive bacteria).	In contaminated environments high proportions are often associated with anaerobic sulfate and iron reducing bacteria
Normal Saturated (Nsats)	Found in all organisms.	High proportions often indicate less diverse populations.
Polyenoic	Found in higher plants, and animals.	Eukaryotic scavengers will often prey on contaminant utilizing bacteria.

 Table 2. Description of PLFA structural groups.



**Physiological Status (***Proteobacteria***)**: Some *Proteobacteria* modify specific PLFA as a strategy to adapt to stressful environmental conditions (3, 4). For example, *cis* monounsaturated fatty acids may be modified to cyclopropyl fatty acids during periods of slowed growth or modified to *trans* monounsaturated fatty acids to decrease membrane permeability in response to environmental stress. The ratio of product to substrate fatty acid thus provides an index of their health and metabolic activity. In general, status ratios greater than 0.25 indicate a response to unfavorable environmental conditions.

## Glossary

**Delta** ( $\delta$ ): A Delta value is the difference between the isotopic ratio ( ${}^{13}C/{}^{12}C$ ) of the sample ( $R_x$ ) and a standard ( $R_{std}$ ) normalized to the isotopic ratio of the standard ( $R_{std}$ ) and multiplied by 1,000 (units are parts per thousand denoted ‰).

 $Delta = (R_x-R_{std})/R_{std} \times 1000$ 

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