July 22, 2015

Ms. Darcy Bybee
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102-0176

Via email: darcy.bybee@dnr.mo.gov

RE: Bridgeton Landfill, L.L.C. – Sulfur Removal Technology Evaluation (Stage 2)- Final Report

Dear Ms. Bybee,

Please find attached the final report of findings for the above referenced project. As per the February 11, 2015 MDNR correspondence, Bridgeton Landfill will be reaching out to the Air Pollution Control Program, to discuss and receive guidance on how to proceed with air permitting.

Sincerely,

Bridgeton Landfill, LLC

James A. Getting, PE
Environmental Manager
P: 314.706.4558
E: jgetting@RepublicServices.com

cc: Tippett Mosby, Leanne (Leanne.TippettMosby@dnr.mo.gov) – Missouri DNR
Hale, Kendall (kendall.hale@dnr.mo.gov) – Missouri DNR
Nagel, Chris (chris.nagel@dnr.mo.gov) – Missouri DNR
Donegan, Kathrina (KDonegan@stlouisco.com) – St. Louis County
Yates, Laura (lyates@stlouisco.com) – St. Louis County
Eggert, Russell (REggert@lathropgage.com) - Lathrop and Gage
Lambrecths, Bob (BLambrechts@lathropgage.com) – Lathrop and Gage
Phillips, Tom (Tom.Phillips@ago.mo.gov) - Missouri Attorney General's Office
Power, Brian (BPower@republicservices.com) – Republic Services

SCS ENGINEERS

Pilot Test Report

Bridgeton Landfill

Presented to:

Bridgeton Landfill, LLC
13570 Saint Charles Rock Road
Bridgeton, Missouri 63044

Presented by:

SCS ENGINEERS
4 Executive Blvd. Suite 303
Suffern, New York 10901
(845) 357-1510

July 22, 2015
File No. 23211003.20

Pilot Test Report
Bridgeton Landfill

Presented To:

Bridgeton Landfill, LLC
13570 Saint Charles Rock Road
Bridgeton, Missouri 63044

Presented By:

SCS ENGINEERS
4 Executive Blvd. Suite 303
Suffern, New York 10901
(845) 357-1510

July 22, 2015
File No. 23211003.20

This Pilot Test Report, developed for the Bridgeton landfill located in Bridgeton, Missouri, dated July 22, 2015, was prepared and reviewed by the following:

Erdal Gurten, P.E.
Senior Project Engineer
SCS ENGINEERS

Gregory P. McCarron, P.E.
Project Manager
SCS ENGINEERS

Table of Contents

Appendices

ES EXECUTIVE SUMMARY

On behalf of Bridgeton Landfill, LLC (Bridgeton LF), SCS Engineers (SCS) previously prepared two letters (dated November 21, 2014 and January 22, 2015; Stage 1 evaluation and Stage 2 evaluation, respectively) to document our evaluation of sulfur removal technologies to treat the landfill gas (LFG) at the Bridgeton Landfill (Landfill). In the January 22, 2015 Stage 2 evaluation letter, SCS identified two process technologies that were potentially viable solutions for sulfur removal at the Landfill: chemical scrubbing and liquid solvent. SCS recommended pilot testing of these two technologies to confirm sulfur removal efficiency, primarily of dimethyl sulfide (DMS), and to identify process parameters needed to design a full-scale facility, if needed.

Subsequently, Bridgeton LF retained SCS to oversee and report on the implementation of two pilot tests. The State of Missouri, Department of Natural Resources (MDNR), Air Pollution Control Program commented on the proposed pilot test program and provided requirements to Bridgeton LF, via letter dated February 11, 2015.

The purpose of the pilot tests was to further evaluate two sulfur removal technologies for possible full-scale implementation at the Landfill. Pilot tests of both technologies were needed to quantify the sulfur removal capabilities of each technology and to identify process parameters needed to design a full-scale facility, if needed.

During the weeks of June 15 and June 22, 2015, Bridgeton LF conducted pilot tests of the two identified technologies. The results of the pilot tests are summarized as follows:

- Six tests were conducted using the chemical scrubbing technology, using varying combinations of chemical reagents. Sodium hypochlorite (i.e., bleach) was effective in removing DMS and other sulfur compounds from the gas stream. However, the consumption rate of bleach was an order of magnitude higher than expected. Increasing the pH of the scrubbing solution appeared to cause a reduction in bleach consumption, when comparing two of the tests. Operations at a higher pH may result in a further reduction in bleach consumption.

- Four tests were conducted using the liquid solvent technology, using varying combinations of chemical reagents and liquid solvents. All tests resulted in ineffective removal of DMS and other sulfur compounds from the gas stream.

Based on the two pilot tests, chemical scrubbing technology and liquid solvent technology are not viable to remove DMS at the concentrations observed at the Landfill.

1.0 INTRODUCTION

On behalf of Bridgeton Landfill, LLC (Bridgeton LF), SCS Engineers (SCS) previously prepared two letters (dated November 21, 2014 and January 22, 2015; Stage 1 evaluation and Stage 2 evaluation, respectively) to document our evaluation of sulfur removal technologies to treat the landfill gas (LFG) at the Bridgeton Landfill (Landfill). In the January 22, 2015 letter, SCS identified two process technologies that were potentially viable solutions for sulfur removal at the Landfill: chemical scrubbing and liquid solvent. SCS recommended pilot testing of these two technologies to confirm sulfur removal efficiency, primarily of dimethyl sulfide (DMS), and to identify process parameters needed to design a full-scale facility, if needed.

Subsequently, Bridgeton LF retained SCS to oversee and report on the implementation of two pilot tests. The State of Missouri, Department of Natural Resources (MDNR), Air Pollution Control Program commented on the pilot test program and provided requirements to Bridgeton LF, via letter dated February 11, 2015.

The purpose of the pilot tests was to further evaluate two sulfur removal technologies for possible full-scale implementation at Bridgeton Landfill. Pilot tests of both technologies were needed to quantify the sulfur removal capabilities of each technology and to identify process parameters needed to design a full-scale facility, if needed.

Each pilot test was designed to estimate sulfur removal efficiency, via inlet and outlet LFG sampling and analysis. A gas chromatograph (GC) was used during both tests to measure sulfur compounds before and after the treatment skids to allow calculation of sulfur removal efficiency. Similarly, reagent consumption/performance was to be assessed by estimating the quantity of reagent used versus the quantity of sulfur removed from the gas. Process parameters were measured and adjusted (for certain parameters; e.g., pH) to identify optimal conditions to maximize sulfur removal and minimize reagent consumption.

Based on discussions between Bridgeton LF, SCS, and Nexo Solutions (Nexo) personnel, Nexo was engaged to pilot test the chemical scrubbing technology. Similarly, Technip Stone & Webster Process Technology, Inc. (Technip) was engaged to pilot test the liquid solvent technology. Nexo and Technip prepared test protocols prior to conducting the pilot tests in the field (see ***Appendices B and D***).

During the weeks of June 15 and June 22, 2015, Bridgeton LF proceeded with pilot testing of the two identified technologies. Pilot testing required the efforts of numerous companies, including the following companies, which are listed in conjunction with their general responsibilities:

1. Bridgeton LF: Overall decision-making; coordination of local vendors; and, provision of field labor for select tasks, such as movement of the test skids within the flare station.

2. SCS: Overall design and direction of test protocols, equipment layout, test oversight, and reporting.

3. Nexo: Lead vendor for chemical scrubbing test, including preparation of the test protocol, rental of test skid, inspection of the installed test equipment, test implementation, and

reporting. Support vendor for liquid solvent test, including LFG analysis using a gas chromatograph (GC).

4. Technip: Lead vendor for liquid solvent test, including preparation of the test protocol, provision of test skid, inspection of the installed test equipment, test implementation, and reporting.

5. Fusion Solutions: Support vendor for both tests, including supply and installation of LFG HDPE piping, and water and wastewater HDPE piping.

6. Kay-Bee Electric (Kay-Bee): Support vendor for both tests, including pre-test inspection of existing electric service and connection of electric service to the test equipment.

7. CEC: Support vendor for chemical scrubbing test, including wastewater testing.

1.1 REPORT FORMAT

The report is organized into two parts: Part A presents the Nexo Pilot Test and Part B presents the Technip Pilot Test. In Part A, report sections A2.0 through A5.0 present the approach, materials, results, and discussions, relative to the Nexo Pilot Test. In Part B, report sections B6.0 through B9.0 present the approach, materials, results, and discussions, relative to the Technip Pilot Test.

Overall conclusions are presented in section 10.0.

The appendices include, among other items, test protocols and reports as prepared by Nexo and Technip.

Part A

Chemical Scrubbing Test

A2.0 NEXO TEST - APPROACH AND METHODOLOGY

A2.1 APPROACH

As part of the Stage 2 technology evaluation (i.e., January 22, 2015 letter), SCS recommended pilot testing of chemical scrubbing, which encompasses a variety of technologies that use different chemical reagents, reactions and processes. Generally, chemical scrubbers are designed such that the sulfur compounds are absorbed into the scrubbing liquid, by maximizing contact between the gas and liquid. Liquid scrubbers typically utilize packed bubble towers, spray towers or venturi absorbers.

As noted above, Nexo was engaged to pilot test the chemical scrubbing technology. Working with Bridgeton LF and SCS personnel, Nexo developed a test protocol to describe the physical setup of the pilot system and the operating scenarios under which it would be evaluated (see Nexo test protocol in ***Appendix B***). SCS prepared the site plan to illustrate the location of the pilot test skid, and the necessary LFG and wastewater piping (see drawing in ***Appendix A***).

For reasons discussed in the Stage 2 technology evaluation letter and as further outlined in the test protocol, Nexo planned to conduct the pilot test with three (3) different reagents, as follows:

- Sodium hypochlorite (NaOCl; bleach).
- Hydrogen peroxide (H_2O_2) alone.
- Hydrogen peroxide (H_2O_2) in combination with ozone (O_3), collectively peroxone.

The test protocol included the use of sodium hydroxide (NaOH; caustic soda) to regulate pH and promote efficient reaction of sulfur compounds.

As noted in the protocol, the pilot system was expected to produce an aqueous effluent with water-soluble, sulfur-based salt by-products (e.g., sulfoxides, sulfones and sulfates) and sodium chloride. SCS planned and coordinated with Bridgeton LF and CEC to collect wastewater samples and to analyze them (see analytical data in ***Appendix H***).

However, during the field test, and specifically during the H_2O_2 test run, unexpected conditions (i.e., high pressure and temperature) were encountered, which resulted in cancelling of this test run after 30 minutes of operation. Additionally, the test run with peroxone was cancelled, due to concerns that the same conditions would occur during testing.

In lieu of the H_2O_2 test and the peroxone test, Nexo and SCS developed alternative tests to conduct. In one alternative test (see Test #3 below), water was used as a reagent in both scrubber towers. In two other alternative tests (see Test #4 and #5 below), water was used as the reagent in the first scrubber tower. A proof of concept test (see Test #6 below), using activated carbon for DMS removal, was also conducted, by passing a small stream of LFG through tubing to a small activated carbon bed (capsule).

Water was used in some of the test runs as a pre-conditioning step in an attempt to remove non-DMS, water-soluble components and thus potentially reduce consumption of the oxidant (i.e.,

bleach or hydrogen peroxide). During testing, apparent DMS removal by the water wash was also observed.

The test protocol included test runs at 300 scfm LFG flow. However, these test runs were not performed because of higher than anticipated reagent consumption rates at a LFG flow rate of 150 scfm.

A2.2 METHODOLOGY

A drawing, illustrating the layout of the pilot system equipment and associated piping, is provided in ***Appendix A***. Nexo rented a scrubber skid from Vapor Technologies (model SST-20; rated up to 750 scfm), which consisted of twin 20-inch stainless steel scrubbing towers with stainless steel packing material. During operation, the LFG enters each tower from the bottom and comes in contact with the liquid solution, entering from the top, in a counter-current fashion. The unit was operated in a "batch mode" configuration during the tests.

Sample ports were installed at the inlet to the first scrubber (identified as Inlet in the data tables), in between the two scrubbers (identified as Intermediate), and at the outlet of the second scrubber (identified as Outlet).

Additional information on the scrubber, as specifically configured for this pilot test, is contained in the Nexo test report, which is provided in ***Appendix C***.

In order to measure LFG flow during the pilot test, an orifice plate was installed on the 4-inch SDR17 HDPE inlet pipe. An inlet valve (HV-1) and a discharge valve (HV-4) were installed on the LFG piping to allow isolation of the scrubber skid and to control the LFG flow rate.

Condensate drain valves were installed at a low point on the LFG inlet piping and at a location immediately upstream of the orifice plate. At the beginning of each test, liquids were drained from LFG pipe low point and from the LFG piping upstream of the orifice plate.

A3.0 NEXO TEST - IMPLEMENTATION

A3.1 MEASUREMENTS AND SAMPLING

In order to control LFG flow during the pilot test, the inlet valve (HV-1) was kept fully open, and the discharge valve (HV-4) was throttled. Differential pressure readings were taken across the orifice plate, using a digital manometer (Dwyer 477A-3), to calculate the LFG flow.

Periodically during the pilot test, gas samples were collected from the system and analyzed by Nexo, using its portable GC. During these gas sample collection events, a "round" of gas samples was collected, which included gas samples at the Inlet, the Intermediate, and the Outlet. Before each sample was collected, the Tedlar gas sampling bags were purged 3 times. The samples were analyzed immediately after collection.

Readings of LFG composition (major gases), temperature, and pressure/vacuum were taken throughout the pilot test by SCS, using hand-held instruments. A copy of SCS' daily field notes and readings are provided in ***Appendix F.***

Samples of wastewater were collected throughout the pilot test by SCS, and temporarily stored in an ice-filled cooler. At the end of each day, the wastewater samples were transferred to CEC, who arranged laboratory analysis of the samples (see ***Appendix H*** for the analytical data). Wastewater samples were analyzed as follows:

- Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260C
- TCLP Semivolatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Methods 1311 / 8270D.
- Semivolatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8270D.
- TCLP Chlorinated Pesticides in accordance with EPA SW-846 Methods 1311 / 8081B
- TCLP Chlorinated Pesticides in accordance with SW-846 Method 9315
- TCLP Metals (ICP) in accordance with EPA SW-846 Method 1311/6010C
- Total Metals (ICP) in accordance with EPA SW-846 Method 6010C
- TCLP Mercury in accordance with EPA SW-846 Method 7470A
- Alkalinity in accordance with SM 2320B
- Total Dissolved Solids in accordance with SM 2540C
- Total Suspended Solids in accordance with SM 2540D
- Anions in accordance with EPA Method 300.0
- Total Cynanide in accordance with EPA Method 335.4
- Ammonia in accordance with EPA Method 350.2
- Total Kjeldahl Nitrogen in accordance with EPA Method 351.2
- Total Phosphorus in accordance with EPA Method 365.4
- Total Residual Chlorine in accordance with SM 4500_CL_g
- Chemical Oxygen Demand in accordance with SM 5220D
- pH in accordance with SM 4500 S2 E
- Sulfide in accordance with SM 4500 S2 E
- Sulfite in accordance with SM 4500 SO3 B
- Biochemical Oxygen Demand in accordance with SM 5210B

A3.2 TIMELINE AND OPERATIONAL SUMMARY

A timeline, which notes major activities and operational parameters, is provided below. Further details are provided in ***Appendix C*** (Nexo Pilot Test report) and ***Appendix F*** (SCS Field Notes).

June 15 – Initial Startup

The following activities were conducted:

- Completion of LFG and condensate piping work.
- Installation of chemical pumps and associated equipment.
- Installation of ozone generator and inspection of the scrubber for leaks.
- Preparation for wastewater sampling.

- Initial system operation using water only, which included setting the valve positions and checking LFG flow rates.

June 16 – Nexo Test #1

The following activities and testing were conducted:

- Execution of bleach test at different operating conditions, which included collection of periodic LFG samples for analysis.
- Analysis of LFG samples with GC.
- Collection of wastewater samples at the end of the test, and delivery of the samples to CEC.

June 17 – Nexo Test #2

The following activities and testing were conducted:

- Preparation for H_2O_2 test.
- Commencement of H_2O_2 test, which included collection of periodic LFG samples for analysis.
- Cessation of the test after 30 minutes, due to unexpected conditions (i.e., high pressure and temperature)
- Execution of bucket tests to investigate the causes of unexpected reactions while testing with H_2O_2.
- Analysis of LFG samples with GC.

June 18 – Nexo Test #3

The following activities and testing were conducted:

- Execution of dual water wash (Test #3A). Both sumps filled with water, and LFG flow set at 135 scfm.
- Execution of dual water wash (Test #3B). Both sumps filled with water, and LFG flow set at 72 scfm.
- Analysis of LFG samples with GC.

June 18 – Nexo Test #4

The following activities and testing were conducted:

- Execution of water wash and bleach test. Sump 1 was filled with water, and Sump 2 was filled with bleach.
- Collection of LFG samples for analysis in GC.
- Analysis of LFG samples with GC.
- Collection of wastewater samples, from Sumps 1 and 2, at the end of the test, and delivery of the samples to CEC

June 19 – Nexo Test #5

The following activities and testing were conducted:

- Execution of water wash and ozone test.
- Collection of LFG samples for analysis in GC.
- Analysis of LFG samples with GC.

June 19 – Nexo Test #6

The following activities and testing were conducted:

- Execution of activated carbon test using inline carbon filters.
- Passed LFG samples through carbon filter.
- Analysis of LFG samples, before and after the carbon filter, with GC.

A4.0 NEXO TEST RESULTS

Analytical data collected during the Nexo test is presented in tabular format in the Nexo Report provided in ***Appendix C***. A summary of the Nexo tests is provided in Table 1 and Table 2 below. In addition, graphical representations of the test results are presented in Figures 1, 2, 3, and 4.

A5.0 NEXO TEST - DISCUSSION

Based on review of the analytical data, discussion points are as follows:

- Six tests were conducted by Nexo, using varying combinations of reagents. All tests were conducted as a batch-mode process.
- Sodium hypochlorite (i.e., bleach) was effective in removing DMS and other sulfur compounds from the gas stream. However, the consumption rate of bleach was an order of magnitude higher than expected (i.e., about 10 times higher during Test #4 and about 20 times higher during Test #1). Increasing the pH of the scrubbing solution from 6 to 8.5 (Test #1 versus Test #4) likely caused the reduction in bleach consumption when comparing the two tests. Operations at a higher pH may result in a further reduction in bleach consumption.
- Water appeared able to remove some DMS and other sulfur compounds from the gas stream, but the solubility of DMS in water is limited. Additionally, there is a concern that DMS would off-gas from the liquid by-product, after it is discharged from the scrubber to the leachate treatment plant.
- Hydrogen peroxide reacted with the gas stream in an uncontrolled manner.
- Activated carbon appeared effective in removing DMS and other sulfur compounds from the gas stream. However, the consumption rate of activated carbon is expected to be high, especially considering the water content of the LFG.
- The combination of ozone injection into the LFG stream and use of the scrubber as a water wash seemed to make negligible difference in removing sulfur compounds.

Table 1. Nexo Test Parameters

Test No.	Date	Sump 1	Sump 2	Total Run Time	LFG Flow	Recirculation Rate	NaOH Injection Rate	Initial pH	Final pH
		Solution		min	scfm	gpm	gph		
Test 1	6/16/2015	12.5% Hypochlorite	12.5% Hypochlorite	69	135	10	-	13	7
		12.5% Hypochlorite	12.5% Hypochlorite	75	135	10	1.2	~6	~6
		12.5% Hypochlorite	12.5% Hypochlorite	20	135	20	1.2	~6	~6
Test 3A	6/18/2015	Water	Water	50	135	25	N/A	-	-
Test 3B	6/18/2015	Water	Water	85	72	25	N/A	-	-
Test 4[(2)]	6//18/2015	Water	12.5% Hypochlorite	150	135	25/10	6.3	12	8.5
Test 5 [(3)]	6/19/2015	Water/Ozone	Water/Ozone	70	135	25	N/A	-	-

Notes:

1. Stopped test at 3:15 for pH adjustment, DMS in 6:30pm samples is about 1,000ppm.
2. At 20:15, half the water was re-charged in Sump 1.
3. Ozone generation capacity: 50% 20%, 90%, 20%

Table 2. Nexo Test Summary Results

Test No.	Date	Start Time	End Time	Total Run Time	Inlet DMS	Outlet DMS	Maximum Reduction	Initial pH	Final pH
				min	ppm	ppm	%		
Test 1[(1)]	6/16/2015	2:06PM	3:15PM	69	947			13	7
		4:15PM	6:30PM	75		166	82%	~6	~6
		6:30PM	6:50PM	20				~6	~6
Total Run Time				**164**					
Test 3A	6/18/2015	1:55PM	2:45PM	50	1182	429	64%	-	-
Test 3B	6/18/2015	5:00PM	6:25PM	85	1135	340	70%	-	-
Test 4[(2)]	6//18/2015	7:20PM	9:50PM	150	1183	31	97%	12	8.5
Test 5[(3)]	6/19/2015	10:30AM	11:40AM	70	1062	155	85%	-	-

Notes:

1. Stopped test at 3:15 for pH adjustment, DMS in 6:30pm samples is about 1,000ppm.
2. At 20:15, half the water was re-charged in Sump 1.

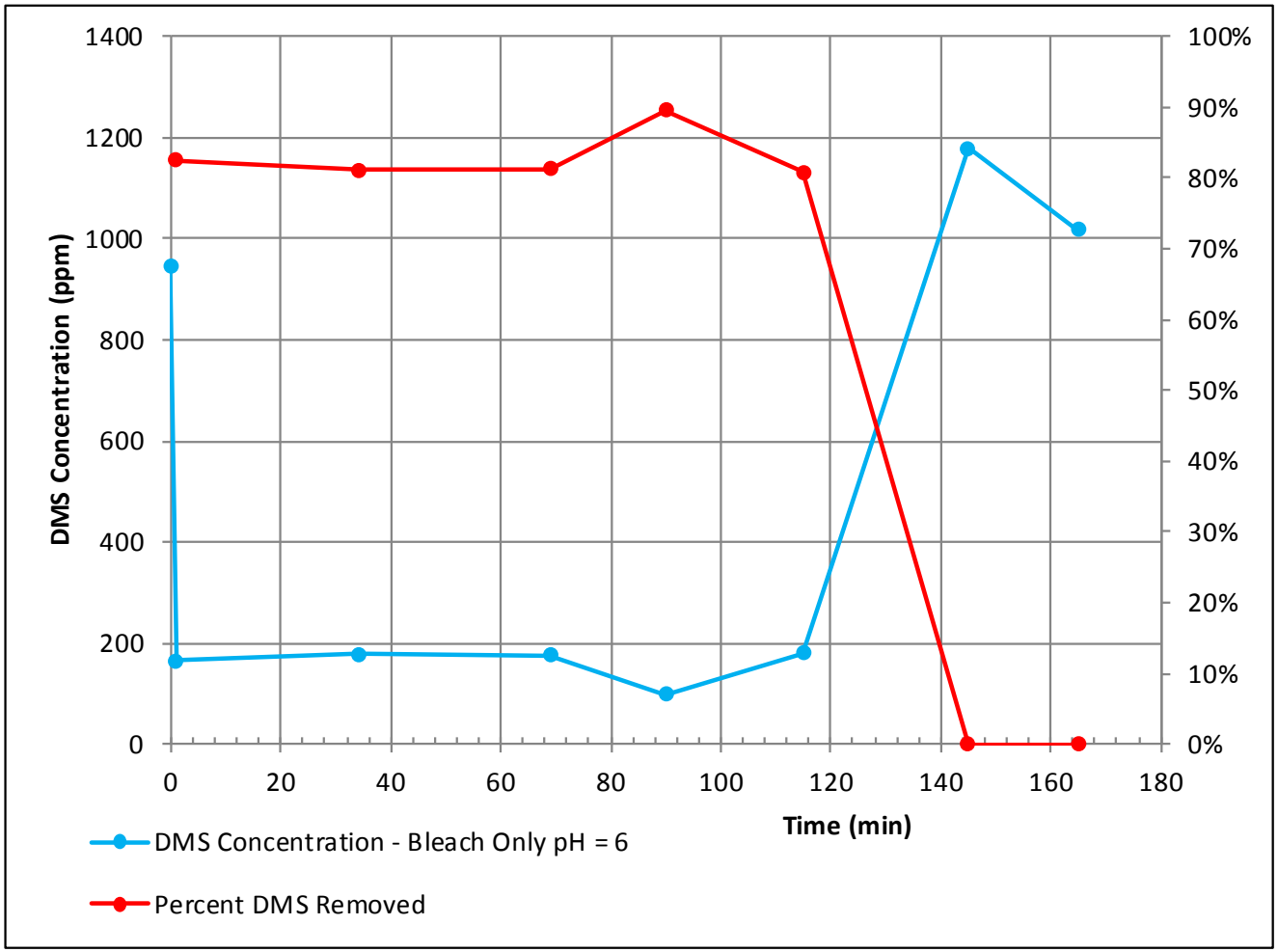


Figure 1. Nexo Test #1 Bleach Test Results

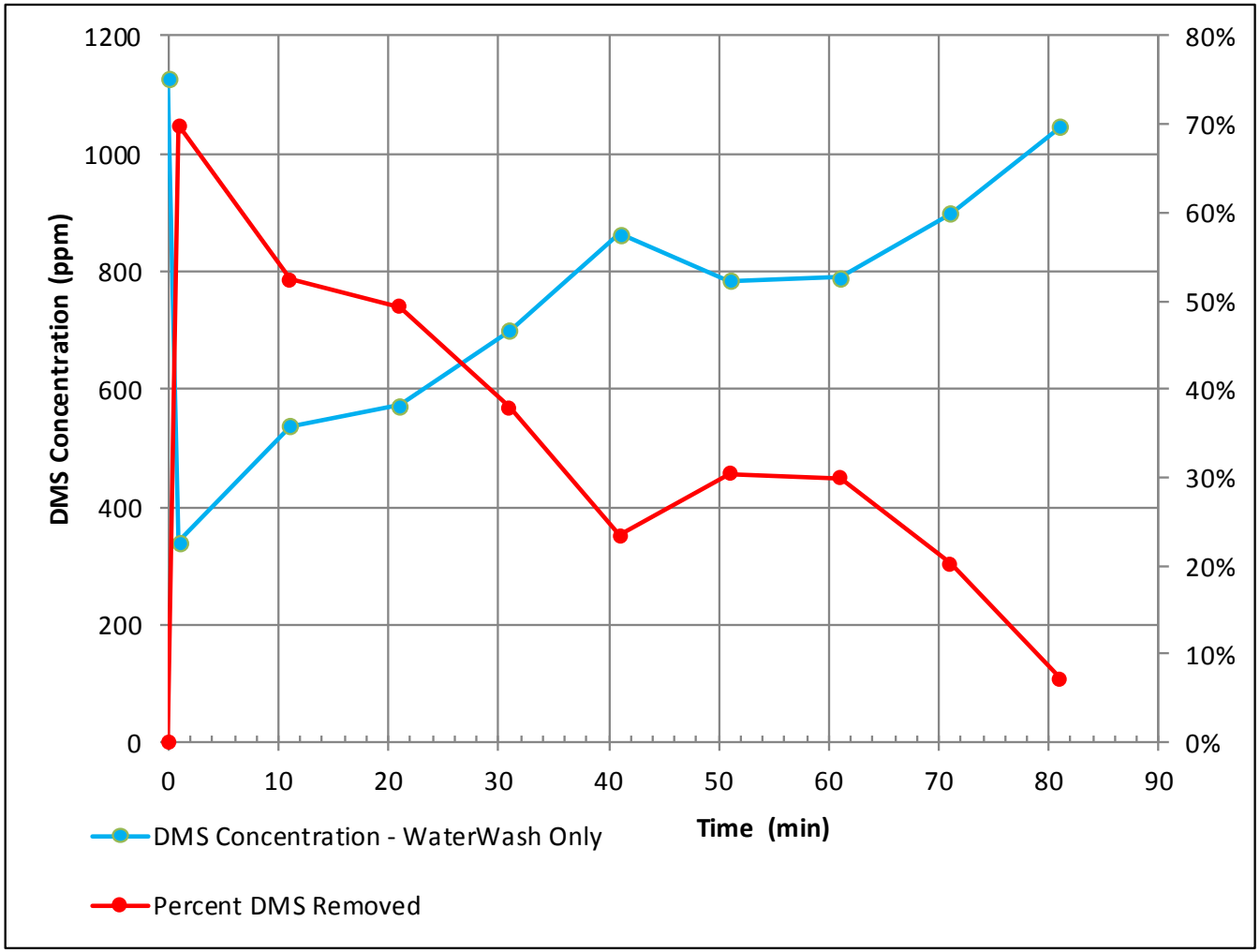


Figure 2. Nexo Test #3B Water Wash Test Results

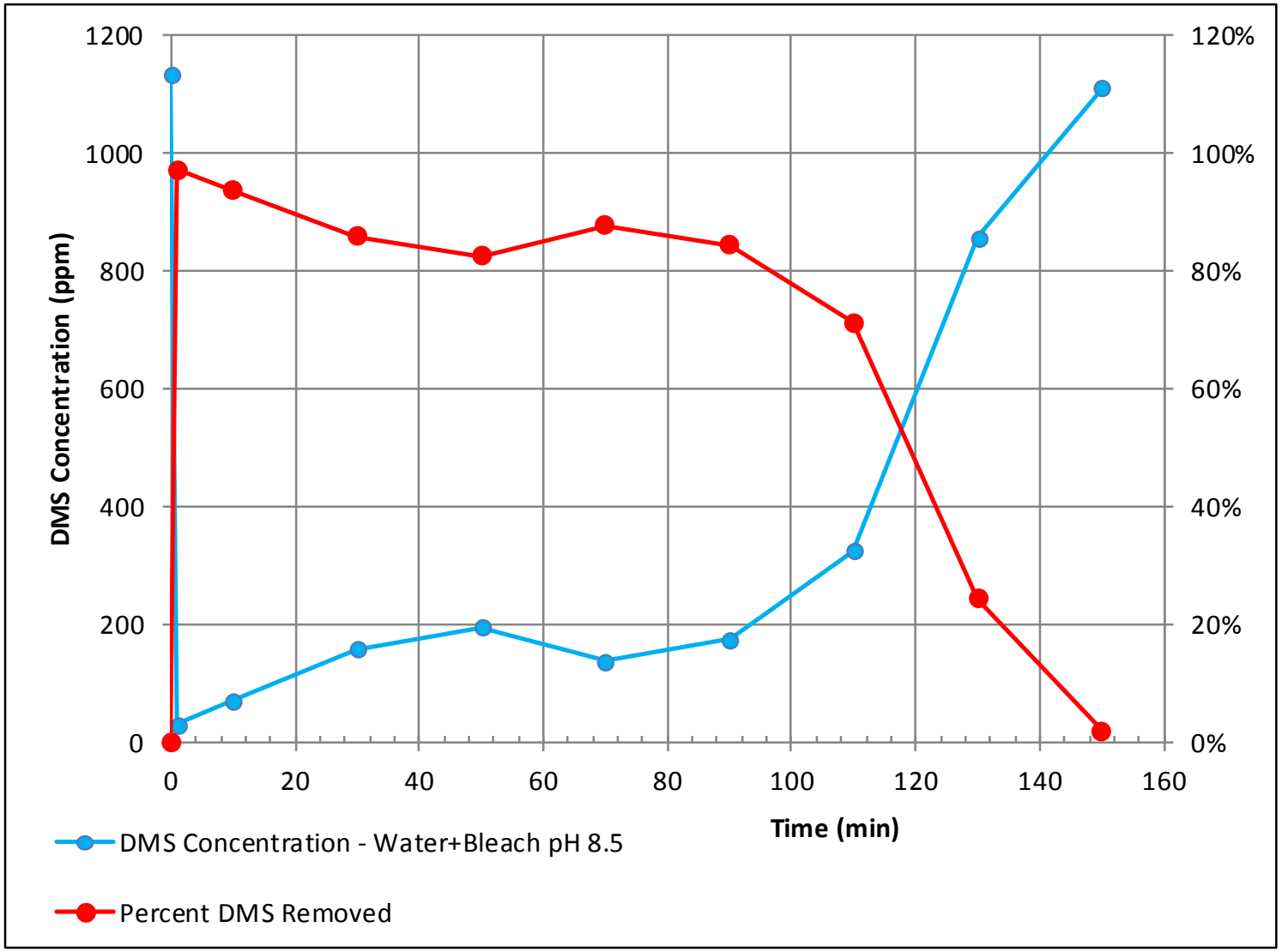


Figure 3. Nexo Test #4 Water Wash + Bleach Test Results

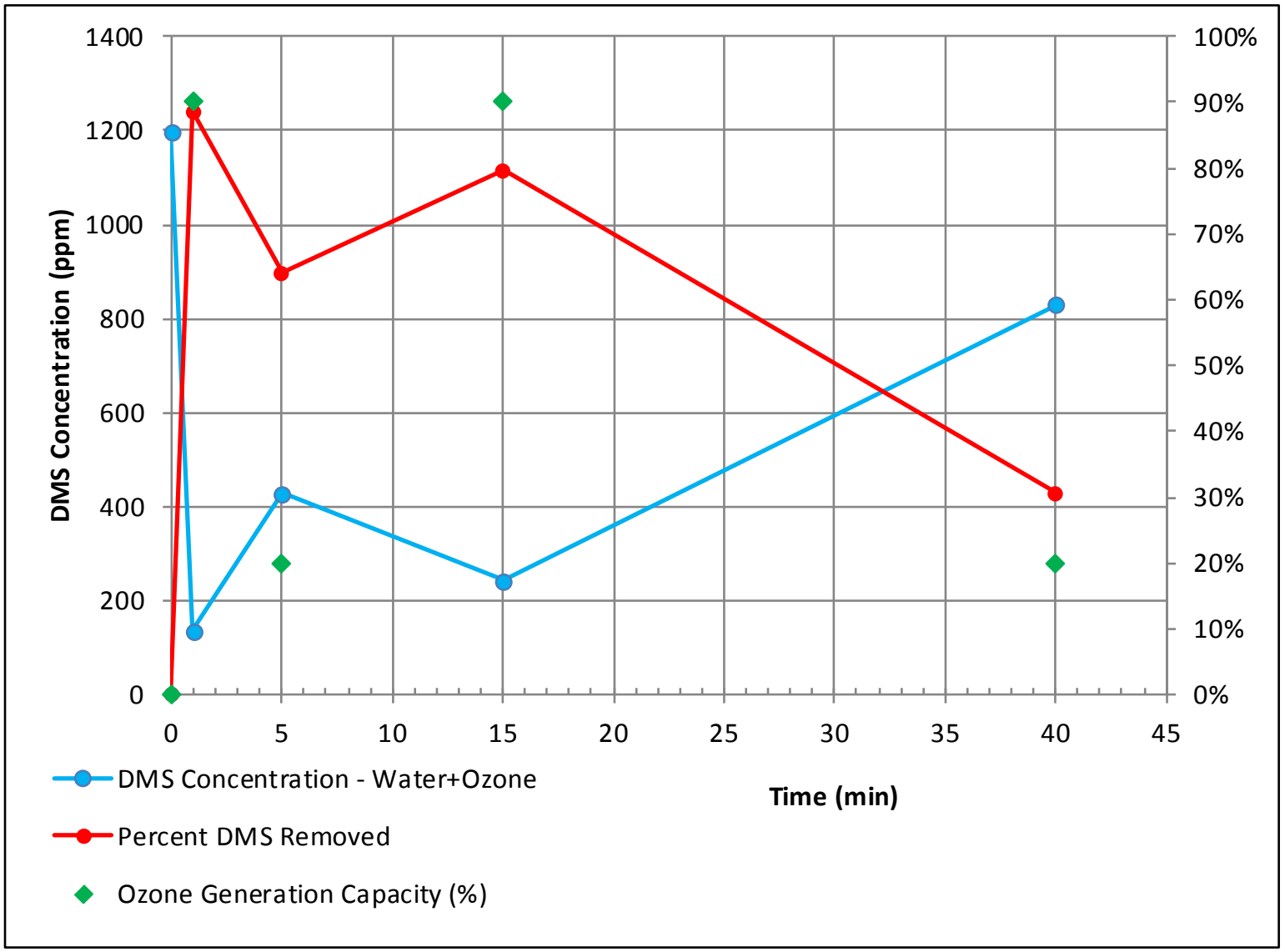


Figure 4. Nexo Test #5 Water + Ozone Test Results

Part B

Liquid Solvent Test

B6.0 TECHNIP TEST - APPROACH AND METHODOLOGY

B6.1 APPROACH

As part of the Stage 2 technology evaluation (i.e., January 22, 2015 letter), SCS recommended pilot testing of a liquid solvent process. Similar to chemical scrubbing, a scrubber is used to promote absorption of the sulfur compounds into the solvent by maximizing contact between the gas and liquid.

As noted above, Technip and its subconsultant, Nrgtek, Inc., were engaged to pilot test the liquid solvent technology. Working with Bridgeton LF and SCS personnel, Technip developed a test protocol to describe the physical setup of the pilot system and the operating scenarios under which it would be evaluated (see Technip test protocol in ***Appendix D***). SCS prepared the site plan to illustrate the location of the pilot test skid, and the necessary LFG piping (see drawing in ***Appendix A***).

Technip planned to conduct the pilot test with two (2) different reagents, as follows:

- Dimethyl sulfoxide (DMSO) as the solvent in the first stage scrubber
- Sodium chloride (NaCl) solution as the solvent in the second stage scrubber.

The Technip/Nrgtek system included 2 techniques to accomplish sulfur removal. The first stage of the process consisted of liquid scrubbers with the above-noted solvents selected for preferential absorption of the sulfur species present in the LFG. The liquid streams were then processed in electrochemical catalytic converters (ECC) to convert the sulfur species and allow the purified solvents to be recycled into the scrubber systems for further removal of sulfur species from the LFG in a closed loop. The pilot system was expected to produce solid by-products.

However, during the field test, satisfactory results with above-noted solvents were not obtained. Technip and Nrgtek developed alternative tests to conduct. In two alternative tests (see Test #2 and #3 below), DMSO and salt water were used in the ECCs. In other alternative tests (see Test #4 below), diluted bleach solution was used in the ECCs.

B6.2 METHODOLOGY

A drawing, illustrating the layout of the pilot system equipment and associated piping, is provided in ***Appendix A***. Technip/Nrgtek fabricated a scrubber skid, which consisted of two process trains. The unit was designed to operate in a “closed loop” configuration during the tests. The solid by-product formed during process was designed to be captured via filters provided with the system.

Sample ports were installed at the inlet to the first scrubber (identified as Inlet in the data tables) and at the outlet of the second scrubber (identified as Outlet). At the beginning of

each test, liquids were drained from LFG pipe low point and from the upstream of the orifice plate.

Additional information on the technology, as specifically implemented for this pilot test, is contained in the Technip Report, which is provided in ***Appendix E***.

B7.0 TECHNIP TEST - IMPLEMENTATION

B7.1 MEASUREMENTS

LFG flow rate measurements were done in a similar manner, as described in Section A3.1. In addition, Technip provided a velocity meter, installed on the skid, which was used as a flow check.

Periodically during the pilot test, gas samples were collected from the system and analyzed by Nexo, using its portable GC. During these gas sample collection events, a "round" of gas samples was collected, which included gas samples at the Inlet and the Outlet. Before each sample was collected, the Tedlar gas sampling bags were purged 3 times. The samples were analyzed immediately after collection.

Readings of LFG composition (major gases), temperature, and pressure/vacuum readings were taken throughout the pilot test by SCS, using hand-held instruments. A copy of SCS' daily field notes and readings are provided in ***Appendix F*.**

Additional information is contained in the Technip report, which is provided in ***Appendix E***.

B7.2 TIMELINE AND OPERATIONAL SUMMARY

A timeline, which notes major activities and operational parameters, is provided below. Further details are provided in ***Appendix E*** (Technip Pilot Test report) and ***Appendix F*** (SCS Field Notes).

June 20 & June 22 – Initial Startup

The following activities were conducted:

- Delivery of the skid, and completion of LFG and condensate piping work.
- Assembly of the loose parts of the skid, and connection of the test skid to LFG and condensate piping.
- Delivery of solvents and other chemicals, charging ECCs with solvents and other chemicals, and checking the test skid for leaks.
- Initial system operation, including setting the valve positions, checking LFG flow rates, and checking voltages/amperages in each ECC.

June 23 – Test #1

The following activities and testing were conducted:

- Troubleshooting of the system (e.g., conductivity issues in ECCs, replacement of blown fuses).
- Execution of test #1, using scrubber #1, in chemical spray mode; ECC-1 was offline; and, scrubber #2 operating as intended.
- Collection of inlet and outlet LFG samples.
- Analysis of LFG samples with GC.

June 24 – Test #2 and #3

The following activities and testing were conducted:

- Charging each ECC with same solution (20 percent DMSO and balance with salt water)
- Execution of test #2, including collection of LFG samples for analysis in GC.
- Execution of test #3 with venturi scrubbers in "packed bed" mode, in order to increase contact time.
- Analysis of LFG samples with GC.

June 25 – Test #4

The following activities and testing were conducted:

- Charging each ECC with diluted bleach solution (~6 percent)
- Modified skid inlet so that it is packed with $DMSO_2$ (solid)
- Execution of test #4, which included use of $DMSO_2$ in removing DMS; bypass ECCs.
- Execution of test variation, using ECCs in "bleach regeneration" mode.
- Analysis of LFG samples with GC

B8.0 TECHNIP TEST RESULTS

Analytical data collected during the Pilot Study is presented in tabular format in the Technip Report provided in ***Appendix E***. A summary of the Technip tests is provided in Table 3 and 4 below. In addition, graphical representations of the test results are presented in Technip Pilot Test Report (see ***Appendix E***).

Table 3. Technip Test Parameters

Test No.	Date	ECC-1			Chiller	Blower	LFG Flow
		Solution	Voltage	Amps		%	scfm
Test 1	6/23/2015	DMSO/Perchorate/Salt Water	N/A	N/A	ON	OFF	20
Test 2	6/24/2015	DMSO/Salt water	41.1	36	ON	33	20
Test 3(1)	6/24/2015	DMSO/Salt water	41	53	ON	34	20
Test 4(2)	6/25/2015	12.5% Bleach and NaOH	34.2	125	OFF	60	50

Test No.	Date	ECC-2				
		Solution	Voltage 1	Amps 1	Voltage 2	Amps 2
Test 1	6/23/2015	Salt Water	17.5	28	17.5	47
Test 2	6/24/2015	DMSO/Salt water	21	62	21	46
Test 3(1)	6/24/2015	DMSO/Salt water	20.7	51	20.6	82
Test 4(2)	6/25/2015	12.5% Bleach and NaOH	16.9	40	15.3	47

Notes:

1. Same as Test 2 with Venturi scubber packed with plastic material.
2. Modified inlet; packed with $DMSO_2$

Table 4. Technip Test Results

Sample Time	Test #2 with Venturi Scrubber-DMSO, Caustic and Salt water in ECCs					
	DMS		H_2S		Mercaptans	
	GC Run 1	GC Run 2	GC Run 1	GC Run 2	GC Run 1	GC Run 2
	ppm	ppm	ppm	ppm	ppm	ppm
Initial Sample	1,025	1,116	40	50	151	137
30 second Outlet	986	1,028	0	0	0	0
1st minute Outlet	896	1,028	0	0	0	0
5th Minute Outlet	982	1,038	0	0	0	0
6th Minute Inlet	1,190	1,242	40	60	142	218
30th Minute Outlet	1,100	1,183	60	60	144	151

Sample Time	Test #3 with Venturi Scrubber Packed -DMSO, Caustic and Salt water in ECCs					
	DMS		H_2S		Mercaptans	
	GC Run 1	GC Run 2	GC Run 1	GC Run 2	GC Run 1	GC Run 2
	ppm	ppm	ppm	ppm	ppm	ppm
Initial Sample	1,143	1,169	40	50	135	139
30 second Outlet	805	826	0	0	0	0
1st minute Outlet	1,838	1,926	0	0	0	0
5th Minute Outlet	1,524	1,565	0	0	0	0
30th Minute Outlet	16,637	16,978	0	0	0	0

B9.0 TECHNIP TEST – DISCUSSION

Based on review of the analytical data, discussion points are as follows:

- Four tests were conducted by Technip, using varying combinations of chemical reagents and liquid solvents.
- Three tests were conducted using dimethyl sulfone (DMSO) at different volumetric ratios. During the tests, DMSO solvent was found largely ineffective in absorbing DMS from the LFG stream in the scrubber. In addition, the ECCs, which were designed to oxidize DMS and other sulfur compounds while regenerating the solvent using electrolysis, were ineffective in oxidizing DMS into DMSO for solvent regeneration.
- Bleach appeared effective in oxidizing DMS and other sulfur in the scrubber. However, the ECCs failed to regenerate the bleach solution, and the bleach solution was quickly depleted.
- The system was run in "packed bed" reactor mode using dimethyl sulfoxide ($DMSO_2$) as the packing media. DMS did not seem to react with the solid media to form DMSO.
- In the light of the test results, Technip has declined to pursue any further process research and development.

10.0 CONCLUSION

Based on the two pilot tests, chemical scrubbing technology and liquid solvent technology are not viable to remove DMS at the concentrations observed at the Landfill.

Appendix A

Pilot System As-Built Drawings

3 1.5 0 3 6

SCALE: 1"=3'

EXISTING ENCLOSED FLARE

EXISTING ELECTRICAL PANEL

EXISTING CIRCUIT BREAKERS

CB14 CB15

EXISTING COMPRESSOR SHED

EXISTING ABOVE GRADE 20" LFG BLOWER DISCHARGE PIPING

TECHNIP SKID

4" FLANGED INLET: 54" HIGH (INLET)

NEW 4" HDPE PIPE (TYP.)

HV-5

SLOPE

CHEMICAL SCRUBBER SKID

4" FLANGED INLET: 54" HIGH (OUTLET)

4" VALVE (TYP.)

HV-2 (CLOSED)

HV-4

HV-6

LP

EXISTING LFG PIPE LOW POINT

PRESSURE TAPS; PT-1 AND PT-2

RESTRICTION ORIFICE PLATE

PT-1

PT-2

BUTTERFLY VALVE; HV-1

MONITORING PORTS; MP-1 AND MP-2

MP-2

MP-1

OZONE GENERATOR

EXISTING ELECTRICAL PANEL

CT-14

483

484

EXISTING HEAT

I:\PROJECTS\F711\23211003.20\SITE PLAN - 2D - PILOT TEST AS-BUILT.DWG layout: AS-BUILT plotted on: 7/14/2015 3:36 PM Gurten, Erdal

NO.	REVISION	DATE
1		
2		
3		
4		
5		
6		

SHEET TITLE
PILOT TEST AS-BUILT PLAN

PROJECT TITLE
SULFUR TREATMENT
BRIDGETON LANDILL

CLIENT
BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC
4 EXECUTIVE BLVD, SUITE 305, SUFFERN, NY 10901
PH. (845) 357-1510 FAX. (845) 357-1049

PROJ. NO: 23211003.20
DSN. BY: GPM
DWN. BY: EG
CHK. BY: GPM
QA/A RVW BY:
APP. BY: GPM

CADD FILE:
AS-BUILT

DATE:
7/14/2015

SCALE:
1" = 3'

DRAWING NO.
1 of **1**

Appendix B

Nexo Pilot Test Protocol

NexoSolutions
Engineering & Technology

May 12, 2015

SCS Engineers
4 Executive Blvd, Suite 303
Suffern, NY 10901

Attention: Greg McCarron
Reference: On-Site Sulfur Removal Testing Procedure Revision 5
Project W15-1007

Bridgeton Landfill LLC and SCS Engineers require a detailed procedure for sulfur removal testing to be performed on site at the Bridgeton Landfill. Nexo Solutions has prepared a step-by-step methodology in order to identify all activities to be performed and to address any aspects of the trial requiring further action. The materials and procedure for testing as well as any details requiring attention are presented below.

For any questions or comments regarding this report, please contact Nexo Solutions at Support@NexoSolutions.com

Sincerely,

Nexo Solutions
Process Efficiency

David Engel, Ph.D.
Managing Director & Senior Engineer
david.engel@nexosolutions.com
+1 (832) 296 6624

Scott Williams
Engineer
scott.williams@nexosolutions.com
+1 (936) 522 7364

Heath Burns
Engineer
heath.burns@nexosolutions.com
+1 (281) 610 6632

Disclaimer

Nexo Solutions has prepared this report solely for the company, persons and purpose stated herein. All information contained in this report is client confidential. This report should not be used in any manner by any other Party.

Nexo Solutions makes no representation to or direct or implied warranty to, or assumes any legal liability to the information contained herein other than that it has exercised reasonable skill, care and diligence in accordance with accepted practice and usual standards of thoroughness and competence for the profession of engineering to collect, assess and evaluate the information used in the preparation of this report. Responsibility for the acceptance and implementation of the recommendations made in this report lies solely with the client.

This report is based upon the information and conditions that were identified at the time of its sampling and preparation and is limited by any qualifications set out in the report. Any information or facts provided by others that have been referred to in the report, or utilized in its preparation are assumed to be accurate without any independent verification or confirmation by Nexo Solutions. Any similarity between this report and other reports may purely be coincidence.

Nexo Solutions does not accept any responsibility for the use of this report for any purpose other than as specifically stated in the report. Nexo Solutions does not have, does not assume, and does not accept, any responsibility or duty of care whether based in negligence or otherwise, in relation to the use of this report in whole or in Part by the client or any third Party. Any use by a third Party, including any reliance on or decision made based on this report, is the sole responsibility of the third Party. Nexo Solutions does not accept responsibility for any direct or indirect damages, if any, suffered by the client or any third Party as a result of decisions made or actions based on this report.

Nexo Solutions has reserved all rights in this report, unless specifically agreed to otherwise in writing by Nexo Solutions. All copyright in this report is solely and exclusively owned by Nexo Solutions, unless otherwise noted. The report may not be reproduced, wholly or in Part in any material form (including photocopying or storing it in any medium by electronic means and whether or not transiently or incidentally to some other use of this report), modified or in any manner communicated to any third Party except with the written approval of Nexo Solutions

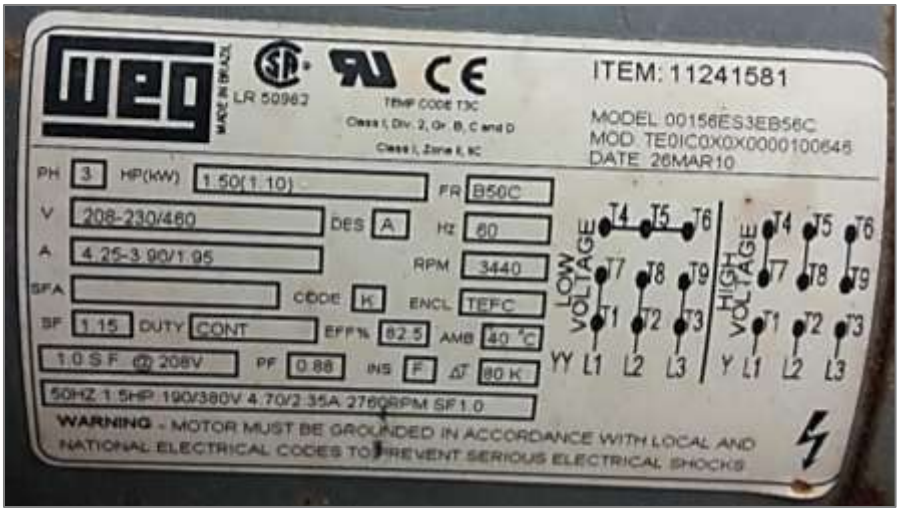
1. Project Background

Bridgeton Landfill LLC (Bridgeton LF) requires removal of dimethyl sulfide (DMS) contamination in a landfill gas (LFG) stream. The DMS contaminants are present in addition to a few other sulfur species. SCS Engineers and Nexo Solutions have evaluated a number of alternatives so far, and 2 technologies have shown adequate feasibility for effective total sulfur removal. It was recommended that field testing be pursued, and for 1 of the technologies, namely scrubbing followed by chemical oxidation (with 2 oxidant formulations), Nexo Solutions will conduct the testing on-site. This report details the procedure, materials needed, and other pertinent details related to on-site testing of the chemical scrubbing system to be conducted by Nexo.

2. Equipment & Materials

Nexo Solutions will provide the chemical scrubber for on-site testing as well as the necessary equipment for sulfur removal efficiency determination. The chemical scrubber to be provided has the following specifications and is also shown in the figure below:

- Maximum Flow Rate (CFM): 750
- Minimum Flow Rate (CFM): 50
- Flow meter not included (needs to be provided)
- Maximum Pressure (PSI): 2
- Maximum Temperature (F): 160
- **Overall Unit Footprint (Scrubber Skid): 72”W x 74”L**
- Empty Weight (Pounds): 1500
- Vapor Inlet: 6” Flange
- Vapor Outlet (From Scrubber Tower #2): 6” Flange
- Number of Towers: 2
- Tower Diameter (Inches): 20
- Packing Height (Feet): 10 (Total for Both Towers)
- Reservoir Capacity (Gallons): 450
- Liquid Fill Port: 2” Camlock Connection
- Number of Pumps: 2
- Unit Equipped with Mist Eliminator
- Liquids drain to bottom compartment
- Cleanout Ports on Scrubber Unit: 2 - 20” Vacuum Lids
- Re-Circulation Pump Type: Magnetic Drive Pumps
- Pressure Drop across System (@ 500 CFM): > 3” of water
- Utility Required for Primary Pump: Mag-Drive (460V,3P)
    - Pump specifications in figure below:



To quantify the levels of sulfur contamination in the landfill gas stream before and after treatment and determine the sulfur (and other odor components) removal efficiency of the test scrubber, an Agilent 490 Micro GC (Gas Chromatograph) will be utilized. The micro GC is small, portable, and can be run on-site to generate results in less than 10 minutes after a sample is injected. The device will be used to frequently measure the removal efficiency of the test scrubber at varying conditions and optimize those conditions based on the results generated. The micro GC consists of three channels constructed specifically for the separation, detection, and quantification of distinct components within the landfill gas stream. The channels and the relevant components they can quantify are presented in the table below.

Compounds Detectable by Agilent 490 Micro GC		
Column:	**PPU 10m HI-BF(185)**	**13CB TBM HI-Str(262)**
Compound:	Methane	*i*-Butane
	Carbon Dioxide	*n*-Butane
	Ethane	*i*-Pentane
	Hydrogen Sulfide	*n*-Pentane
	Carbonyl Sulfide	*n*-Hexane
	Propane	*n*-Heptane
		n-Octane
		n-Nonane
		n-Decane
		Methyl Mercaptan
		Ethyl Mercaptan
		C3 Mercaptans
		C4+ Mercaptans
		Tetrahydrothiophene
		Dimethyl Sulfide
		Methyl Ethyl Sulfide
		Diethyl Sulfide
		Dimethyl Disulfide

Ancillary equipment and materials to be provided by Nexo include:

- Chemical transfer pump
- Transfer hoses from the chemical totes to pump and from pump to slipstream line
- Gas sampling equipment (Tedlar bags, connections, and syringes)
- pH indicators
- Ozone generation system (details and specification to be provided)

Additional equipment and materials that must be provided by SCS or Bridgeton include:

- Piping for the LFG slipstream and chemical additive disposal line, scrubber connections
- Chemical additives
- Power availability
- Water availability (purified water is preferable, however city water is sufficient)

The expected chemical usage rates for on-site testing are shown in the table below. The additives will be injected directly into the scrubber. Ozone will be generated using an ozone generator on-site and injected upstream of the scrubber into the LFG slipstream feed.

Chemical Additive Usage Rates (for gas flow rate of 150 CFM)	
12.5% NaOCl (gal / hour)	6.73
50% H_2O_2 (gal / hour)	0.14 – 0.30
O_3 (lbs / hour)	1.7 – 2.2
10% NaOH (gal / hour)	1.95

3. General Procedure

The equipment installation required prior to testing includes piping of a slipstream from the main landfill gas (LFG) stream to the test unit area, setup of the test unit area, piping of a slipstream for LFG effluent from the test unit area to an appropriate line (to be determined by Bridgeton), and piping of a line for spent chemical solution to an appropriate line or tank (to be determined by Bridgeton). All test unit piping and equipment aspects should be verified and finalized before Nexo arrival for on-site testing. The chemical scrubber and all auxiliary components will then be fully prepared for operational use including utility connections (as required), slipstream piping, and equipment setup. The procedures for handling equipment associated with the scrubber are listed below:

- Placement: Set unit on level grade and attach grounding cable. When scrubbing flammables, always make sure scrubber is properly grounded.
- Introduction of Chemical Media: Make sure drain valves are closed. Open 2” fill cap and add chemical media. Once the chemical has been added and diluted (water based only) with water, make sure level is not above Maximum Fill Mark (shown near sight gauge). The vapors need this airspace in the top of the tank to be able to flow through each tower.

Filling the reservoir or allowing the liquid to accumulate past the 75% capacity could raise system backpressure or completely block airflow to tower #1.

- Connection of Pumps: Wire 460V power to mag-drive pump motor starter box. If chemical media has been added to reservoir, open suction valve on mag-drive pump and 'bump' starter to check for proper rotation..
- Unit Operation: Once chemical has been added, the unit should be ready to run. Open suction and discharge valves to mag-drive pump. Close valves to diaphragm pump and keep it locked out. Start the mag-drive pump and check for leaks. Check and make sure flow meters on each tower read at least 10 GPM. Once chemical media is stable, pipe vapor inlet to vapor source. Clamp down securely to avoid vapor leaks. Begin introducing vapors to the vapor scrubber. When done, disconnect and drain chemical.
- Chemical Tolerances: With most water-based solutions, once the chemical is saturated it will begin to lose its efficiency. When the solution starts to loose efficiency, it is advisable to drain and re-fill with fresh solution or replenish the system. For solutions which operate off of pH simply monitor the pH regularly and add chemical as needed to maintain your optimal set point. For neutralization jobs such as acids & bases, make sure a controller is attached or personnel is present to manually keep pH within proper range.

Test Unit Operation

The testing will include start-up and operation of the pilot chemical scrubbing system as well as analysis of the effluent LFG streams by gas chromatography (GC). Each sample will be captured in specialized containers (Teddlar bags for low pressure sampling) in order to ensure proper sample conservation. Samples will be taken and analyzed each day of operation, 4 or more times per day, at the test unit. GC analysis will be handled by Nexo on-site. The results of GC analysis will be used to quantify and speciate the components present in the LFG streams and calculate the odor component removal efficiency.

Temperature (laser gun) and pressure (upstream of the scrubber) will be monitored and considered in the evaluation of testing results. Other aspects to be monitored, evaluated, and optimized based on GC results include NaOH addition rate, oxidant formulation concentration, oxidant solution flow rate, oxidant solution recirculation and purge rates, caustic concentration and flow rate, and gas flow rate. The chemical additive usage rates listed in the table above will be used as starting points for scrubber operation, at a gas flow rate of 150 CFM. The gas flow rate (bed residence time) will first be optimized based on GC results for odor component removal at initial set-points for chemical usage. The formulation and flow rate of the oxidant chemistry and caustic will then be optimized based on GC results for odor component removal as well as overall chemical usage. Recirculation and/or spent chemical purge flow rates will be optimized after the best formulations are determined to ensure adequate DMS removal with minimal purge flow. Efficiency will be determined based on inlet and outlet DMS concentration and analyzed by Gas Chromatography.

After on-site testing is complete, the test unit, auxiliary components and the slipstream will be shut down, purged, cleaned, disassembled, and packed, and all plant materials shall be properly handled by site personnel.

Tentative Testing Schedule

Day 1 – Verification of scrubber assembly and initial flow to scrubber, system stabilization, baseline gas analysis

Day 2 – Testing with NaOCl additive (6.73 GPH initial set-point). Higher and lower flow rates will be used depending on gas analysis. Gas samples will be analyzed every 30-45 minutes.

Chemical Additive Requirements (for gas flow of 150 CFM) and Wastewater Discharge Rate	
12.5% NaOCl (gal / 8 hour day)	53.8
10% NaOH (gal / 8 hour day)	15.8
Wastewater Discharge Rate (gal / 8 hour day)	60.1

Day 3 – Cleanup of equipment associated with NaOCl additive, system stabilization, baseline gas analysis, data analysis, setup for H_2O_2/O_3 testing.

Day 4 – Testing with H_2O_2 additive (0.30 GPH initial set-point). Higher and lower flow rates will be used depending on gas analysis. Gas samples will be analyzed periodically.

Chemical Additive Requirements (for gas flow of 150 CFM) and Wastewater Discharge Rate	
50% H_2O_2 (gal / 8 hour day)	2.4
10% NaOH (gal / 8 hour day)	15.8
Wastewater Discharge Rate (gal / 8 hour day)	8.7

Day 5 – Testing with H_2O_2/O_3 additive (0.14 GPH, 1.7 lb/h initial set-points). Higher and lower flow rates will be used depending on gas analysis. Gas samples will be analyzed 5periodically.

Chemical Additive Requirements (for gas flow of 150 CFM) and Wastewater Discharge Rate	
50% H_2O_2 (gal / 8 hour day)	1.1
O_3 (lbs / 8 hour day)	40.4
10% NaOH (gal / 8 hour day)	15.8
Wastewater Discharge Rate (gal / 8 hour day)	7.4

Day 6 – Cleanup, disassembly and packing of testing equipment; data analysis

Day 7 – Flexible

4. Application Details and Action Items

Spent Chemical Wastewater

The expected usage rate of chemical additives and water during on-site testing ranges from 0.9-7.5 GPH depending on the oxidant formulation being used, and this rate is the essentially equivalent to the wastewater discharge rate. The wastewater discharge rate may be higher depending on testing results and consequent set-point modifications. The discharge stream will carry a number of contaminants from the gas stream that are soluble in water in varying concentrations; these compounds may include BTEX, polar constituents such as methanol and acetone, salts, and any other unknown components in the LFG stream. The concentration of these components in the wastewater stream is dependent on both their concentration in the LFG stream and their solubility in water.

The spent chemical additives and their by-products will also add a small number of components to the wastewater discharge. Periodic water-water samples will be taken for waste-water analysis (not included in the scope of work). The reaction of sulfur compounds with NaOCl creates sulfoxides, sulfones and sulfates in addition to chlorides. The peroxone formulation will create the same by-products plus dissolved oxygen (as a result of ozone injection), but without the addition of chlorides to the solution. These by-products are all water-soluble and stable. The table below shows the estimated concentrations of these by-products in the LFG stream.

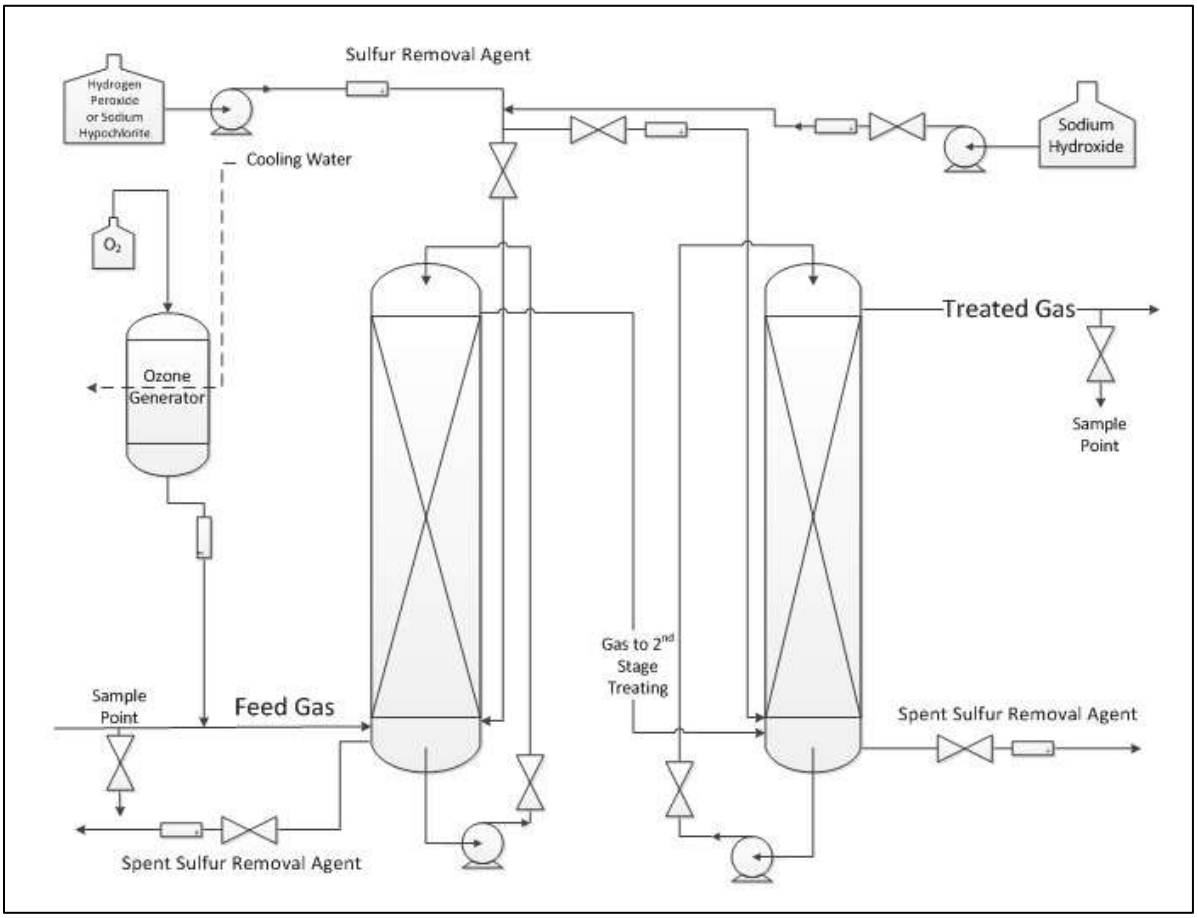
	NaOCl Treatment	Peroxone Treatment
Wastewater Discharge Rate (GPH)	7.5 - 9.8	1.1 - 1.4
Elemental Sulfur, Sulfoxides, Sulfones, and Sulfates (mol/L)	0.44 - 0.58	3.08 - 4.00
Cl^- (mol/L)	1.81 - 2.35	--
Na^+ (mol/L)	2.18 - 2.83	2.58 - 3.35
Residual Oxidant (%)	~2.0	~2.0
BTEX	ppm levels	
Polar Solvents	ppm levels	
Salts	ppm levels	

5. Test Points

Inlet LFG and outlet treated LFG will be sampled using Tedlar bags for low pressure service. The sample will be taken using installed Swagelok ball valves as indicated in the figure below. The valves have to be mounted on the main line, outside of the limits of the chemical scrubber. Sampling points are indicated in the chemical scrubber diagram below. Additional connections will be provided by Nexo Solutions.

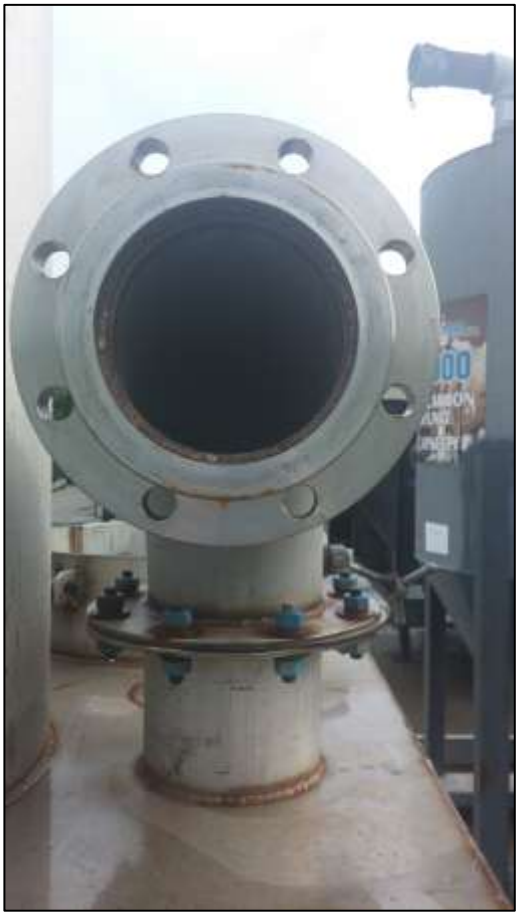
http://www.apollovalves.com/products/by_product_specific/312

Chemical Scrubber Diagram



6. Additional Details

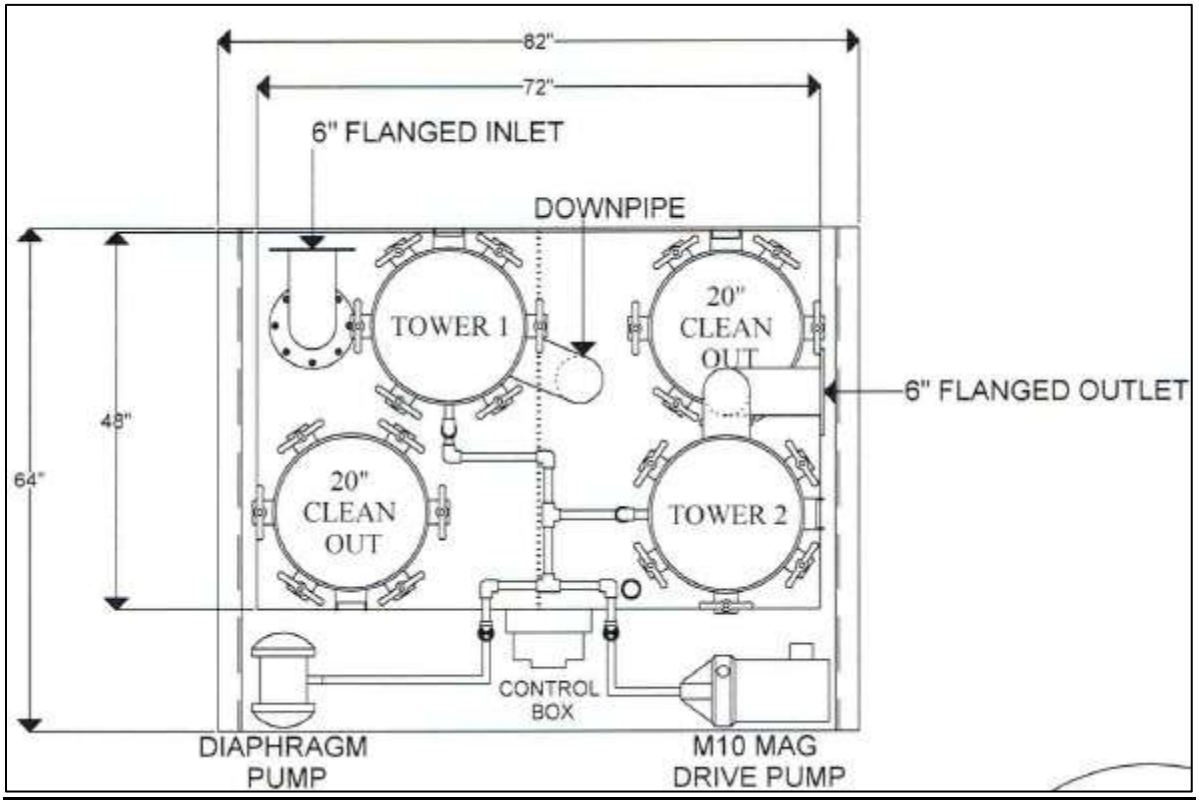
Inlet/Outlet Connections



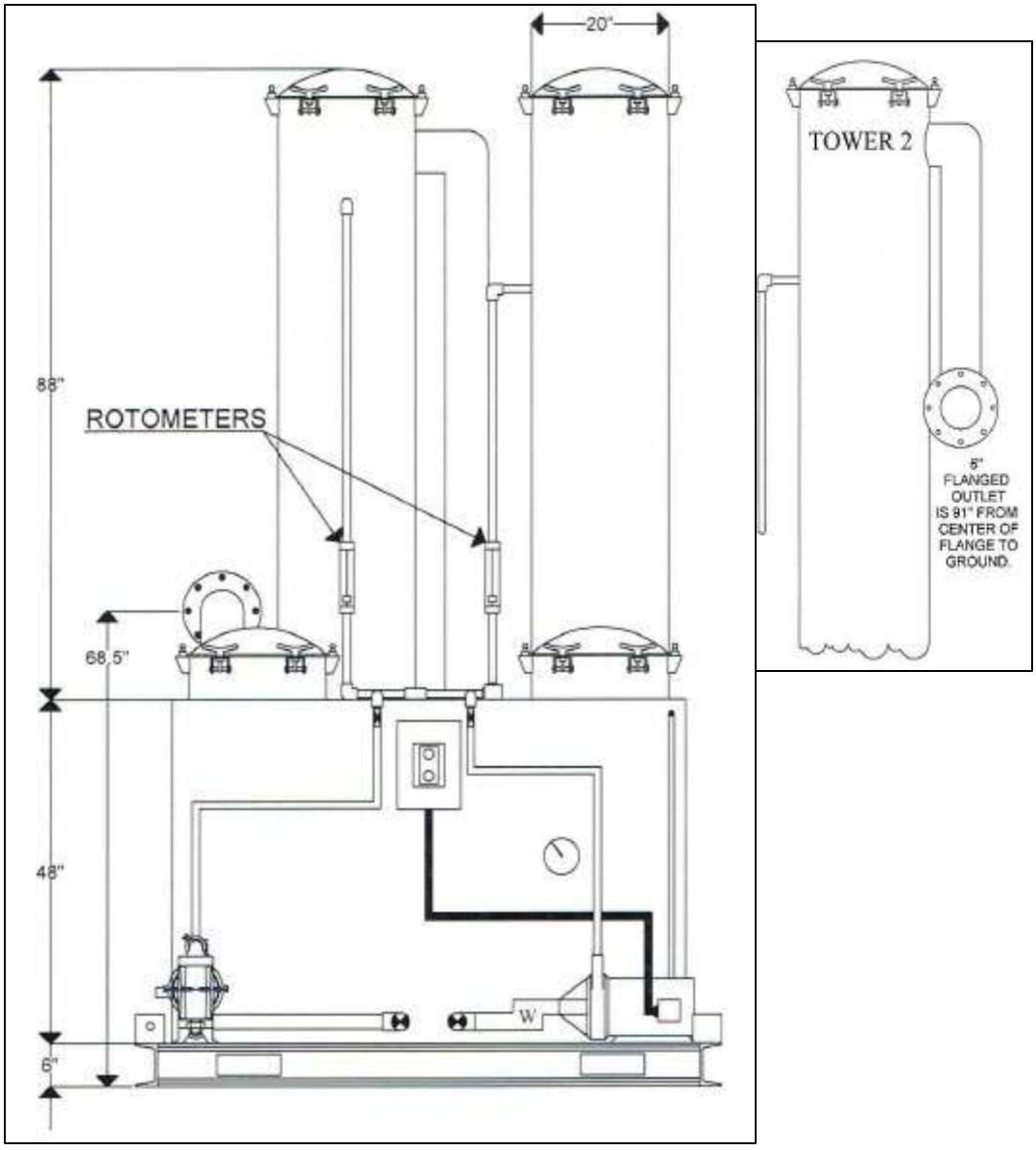
Electrical Connections

Drain Line

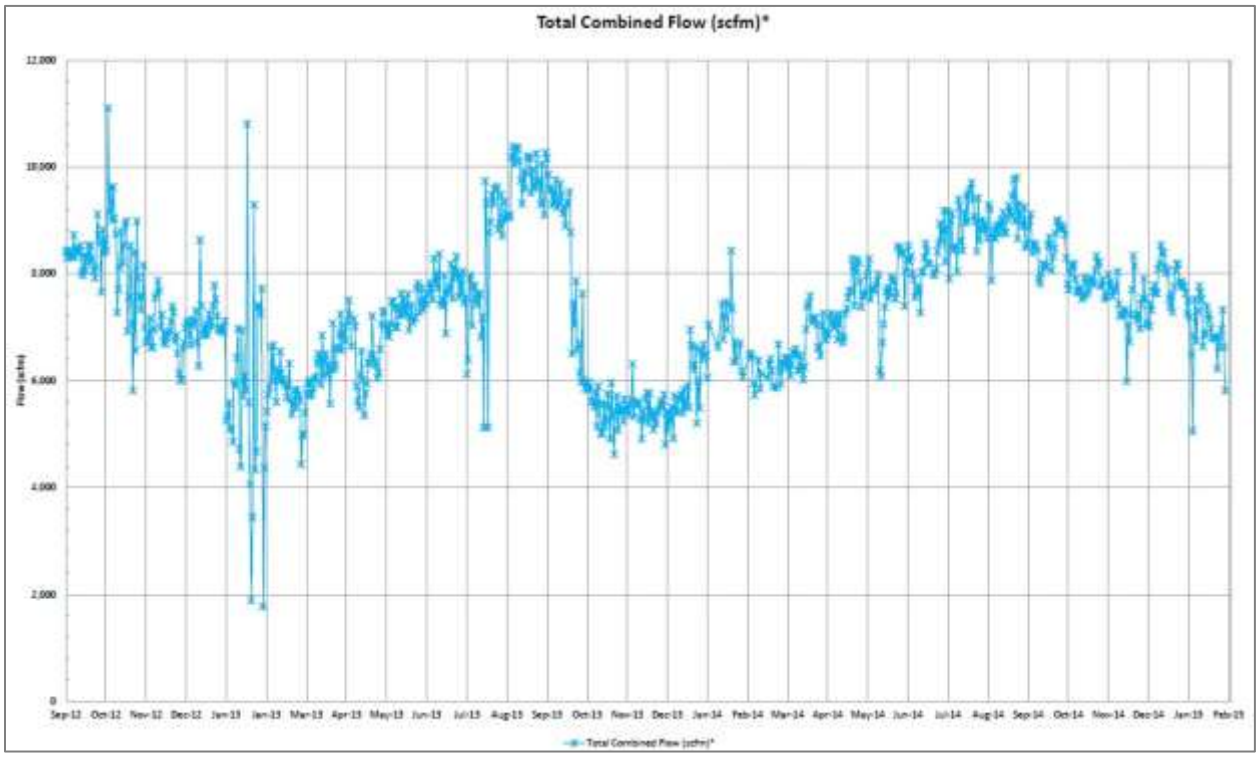
Floor Plan

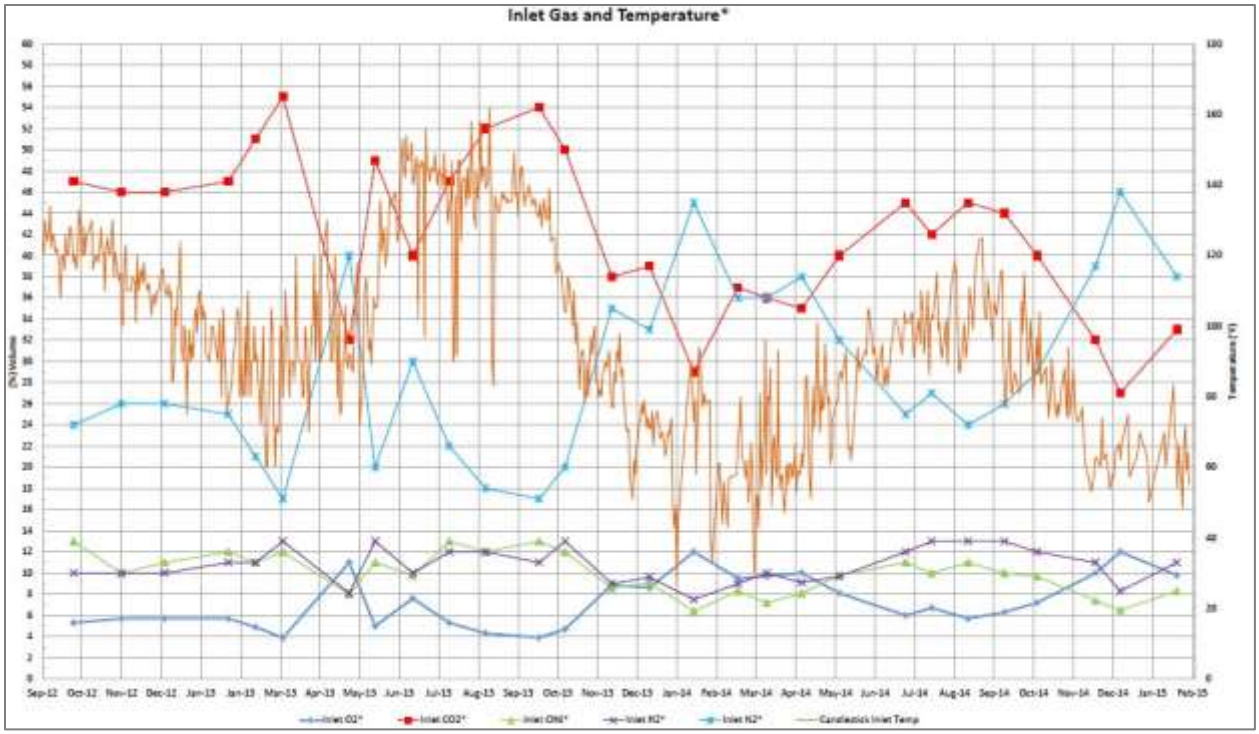

82"
72"
6" FLANGED INLET
DOWNPIPE
TOWER 1
20" CLEAN OUT
6" FLANGED OUTLET
48"
64"
20" CLEAN OUT
TOWER 2
CONTROL BOX
DIAPHRAGM PUMP
M10 MAG DRIVE PUMP

Floor Plan

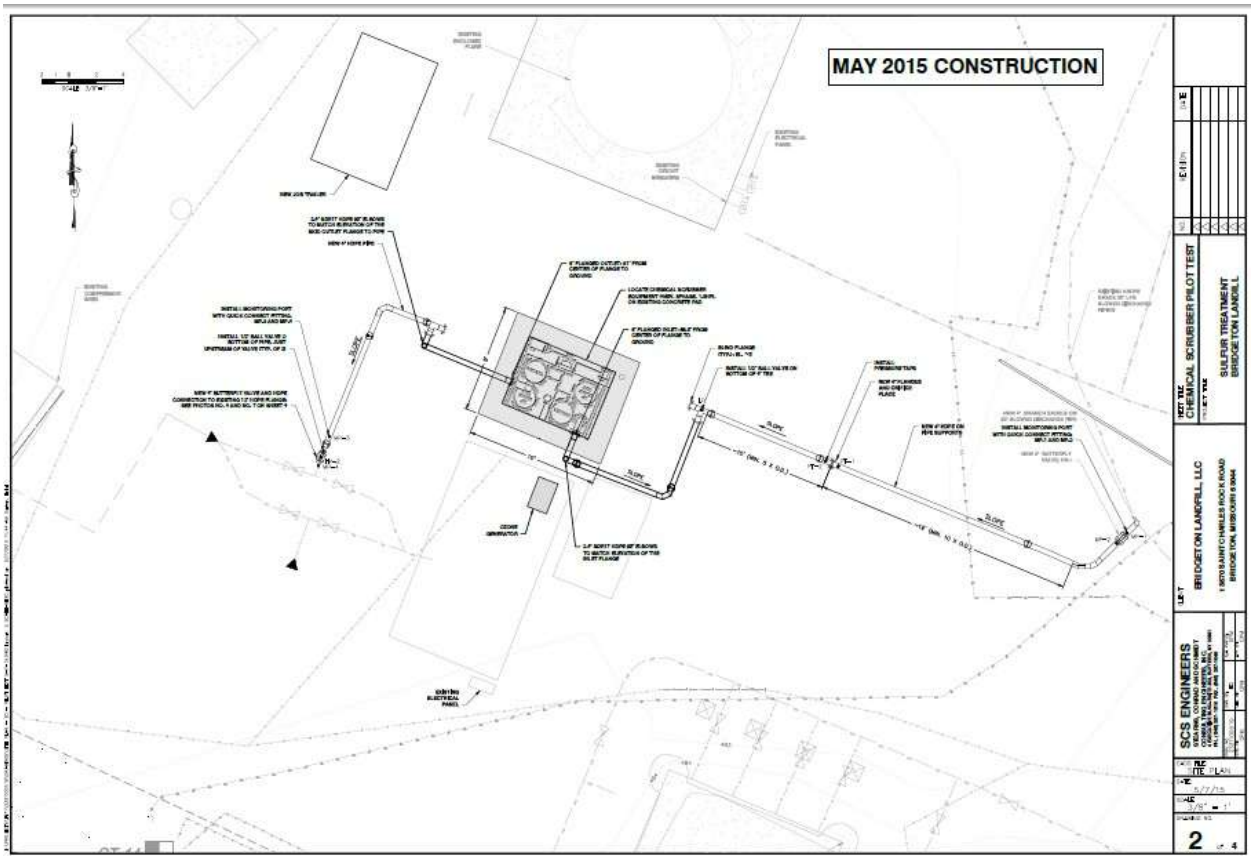

20"
88"
ROTOMETERS
68.5"
48"
6"
W
TOWER 2
6" FLANGED OUTLET IS 91" FROM CENTER OF FLANGE TO GROUND.

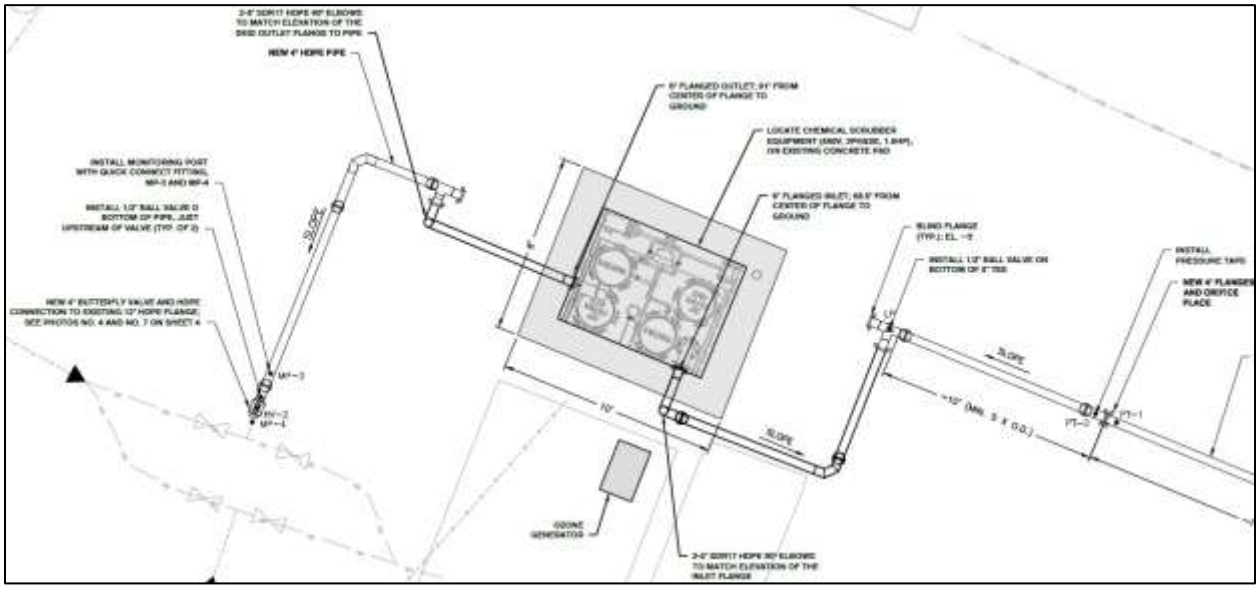
Total LFG Flow and Temperature Data





Site Plan


MAY 2015 CONSTRUCTION
CHEMICAL SCRUBBER PILOT TEST
SULFUR TREATMENT
BRIDGETON LANDFILL
BRIDGETON LANDFILL, LLC
SCS ENGINEERS
SITE PLAN
2


NEW 4" HDPE PIPE
6" FLANGED OUTLET, 21' FROM CENTER OF FLANGE TO GROUND
LOCATE CHEMICAL SCRUBBER EQUIPMENT (SKID, DP/MIST, T, BHP), ON EXISTING CONCRETE PAD
6" FLANGED INLET, 65.5' FROM CENTER OF FLANGE TO GROUND
BLIND FLANGE (TYP.); EL. ~5'
INSTALL 1/2" BALL VALVE ON BOTTOM OF 6" TEE
INSTALL PRESSURE TAPS
NEW 4" FLANGES AND ORIFICE PLATE
INSTALL MONITORING POST WITH QUICK CONNECT FITTING, MP-3 AND MP-4
INSTALL 1/2" BALL VALVE D BOTTOM OF PIPE, JUST UPSTREAM OF VALVE (TYP. OF 2)
NEW 4" BUTTERFLY VALVE AND HDPE CONNECTION TO EXISTING 12" HDPE FLANGE, SEE PHOTOS NO. 4 AND NO. 7 ON SHEET 4
SLOPE
10'
~10' (MIN. 5 X O.D.)
OZONE GENERATOR

Chemical Inventory

Chemical Additive Requirements (for gas flow of 150 CFM) – Day 2	
12.5% NaOCl (gal / 8 hour day)	53.8
10% NaOH (gal / 8 hour day)	15.8

Chemical Additive Requirements (for gas flow of 150 CFM) – Day 4	
50% H_2O_2 (gal / 8 hour day)	2.4
10% NaOH (gal / 8 hour day)	15.8

Chemical Additive Requirements (for gas flow of 150 CFM) – Day 5	
50% H_2O_2 (gal / 8 hour day)	1.1
10% NaOH (gal / 8 hour day)	15.8

Total Chemical Additive Requirements (Inventory Estimate)*	
50% H_2O_2	**2 totes**
12.5% NaOCl	**1 tote**
10% NaOH	**1 tote**

.

Detailed Testing Procedure

Test 1 – Sodium Hypochlorite (NaClO)

Chemical scrubber is connected and all parts tested with water

1) Verify all drains lines are closed, Vents open.
2) Fill chemical reservoirs with 12.5% NaClO (12 inches height, 98 gal each section) using a transfer pump. Filling can be via the hatch or hose connection
3) No gas flow
4) Start chemical pumps for both reservoirs
5) Set flow rate at 10 GPM
6) Run for 5 minutes. Check leaks and flow.
7) Verify chemical pump operation. Ensure pumps are not vibrating or cavitating
8) Take sample and measure pH
9) Adjust pH =10 if necessary. Inject NaOH 10% at chemical pump feed
10) Close vents and hatch. Inspect ports are all closed
11) Open inlet gas
12) Open outlet shortly thereafter
13) Allow system to equilibrate. Check Gas flow reading. Adjust gas flow to 150 CFM
14) Adjust chemical flow if necessary
15) Take samples in Tedlar bags (inlet, outlet 2^{nd} stage, and outlet of 1^{st} stage). Use manual pump if necessary to take sample
16) Monitor pH and adjust if necessary
17) Initial samples takes in duplicate
18) Test Scenarios:
    a. 150 SCFM LFG flow and 10 GPM chemical recirculation
    b. 150 SCFM LFG flow and 20 GPM chemical recirculation
    c. 300 SCFM LFG flow and 10 GPM chemical recirculation

Test 2 – Hydrogen Peroxide (H_2O_2)

Chemical scrubber is connected and all parts tested with water

1) Verify all drains lines are closed, Vents open.
2) Fill chemical reservoirs with 50% H_2O_2 (12 inches height, 98 gal each section) using a transfer pump. Filling can be via the hatch or hose connection
3) No gas flow
4) Start chemical pumps for both reservoirs
5) Set flow rate at 10 GPM
6) Run for 5 minutes. Check leaks and flow.
7) Verify chemical pump operation. Ensure pumps are not vibrating or cavitating
8) Take sample and measure pH
9) Adjust pH =10 if necessary. Inject NaOH, 10% at chemical pump feed
10) Close vents and hatch. Inspect ports are all closed
11) Open inlet gas
12) Open outlet shortly thereafter
13) Allow system to equilibrate. Check Gas flow reading. Adjust gas flow to 150 CFM
14) Adjust chemical flow if necessary
15) Take samples in Tedlar bags (inlet, outlet 2^{nd} stage, and outlet of 1^{st} stage). Use manual pump if necessary to take sample
16) Monitor pH and adjust if necessary
17) Initial samples takes in duplicate
18) Test Scenarios:
    a. 150 SCFM LFG flow and 10 GPM chemical recirculation
    b. 150 SCFM LFG flow and 20 GPM chemical recirculation
    c. 300 SCFM LFG flow and 10 GPM chemical recirculation

Test 3 – Hydrogen Peroxide (H_2O_2) /Ozone (O_3)

Chemical scrubber is connected and all parts tested with water

1) Verify all drains lines are closed, Vents open.
2) Fill chemical reservoirs with 50% H_2O_2 (12 inches height, 98 gal each section) using a transfer pump. Filling can be via the hatch or hose connection
3) No gas flow
4) Start chemical pumps for both reservoirs
5) Set flow rate at 10 GPM
6) Run for 5 minutes. Check leaks and flow.
7) Verify chemical pump operation. Ensure pumps are not vibrating or cavitating
8) Take sample and measure pH
9) Adjust pH =10 if necessary. Inject NaOH, 10% at chemical pump feed
10) Close vents and hatch. Inspect ports are all closed
11) Open inlet gas
12) Open outlet shortly thereafter
13) Allow system to equilibrate. Check Gas flow reading. Adjust gas flow to 150 CFM
14) Adjust chemical flow if necessary
15) Start ozone injection
16) Take samples in Tedlar bags (inlet, outlet 2^{nd} stage, and outlet of 1^{st} stage). Use manual pump if necessary to take sample
17) Monitor pH and adjust if necessary
18) Initial samples takes in duplicate
19) Test Scenarios:
    a. 150 SCFM LFG flow and 10 GPM chemical recirculation
    b. 150 SCFM LFG flow and 20 GPM chemical recirculation
    c. 300 SCFM LFG flow and 10 GPM chemical recirculation

Data Table

Date	Time Start	Time Stop	Chemical Solution	Recirc Rate	pH	Gas Flow	Pressure	Temp	Inlet Sample	Outlet 1 Sample	Outlet 2 Sample

Appendix C

Nexo Pilot Test Report

NexoSolutions
Engineering & Technology

July 22, 2015

Bridgeton Landfill, LLC.
13570 Saint Charles Rock Road
Bridgeton, MO 63044

Attention: Greg McCarron, Erdal Gurten
Reference: On-Site LFG Treatment Testing
Project W15-1007

Republic Services requires the removal of odorous sulfur compounds in a landfill gas stream. Nexo Solutions and SCS Engineers performed on-site slipstream testing of the gas stream using a number of chemical solutions to remove the sulfur contamination in a scrubbing system. The results of this testing and its interpretation are presented below.

For any questions or comments regarding this report, please contact Nexo Solutions at Support@NexoSolutions.com

Sincerely,

Nexo Solutions
Engineering & Technology

Scott Williams, BSChE
Engineer
scott.williams@nexosolutions.com
+1 (936) 522 7364

David Engel, Ph.D.
Managing Director & Senior Engineer
david.engel@nexosolutions.com
+1 (832) 296 6624

Heath Burns, BSME
Engineer
heath.burns@nexosolutions.com
+1 (281) 610 6632

Disclaimer

Nexo Solutions has prepared this report solely for the company, persons and purpose stated herein. All information contained in this report is client confidential. This report should not be used in any manner by any other Party.

Nexo Solutions makes no representation to or direct or implied warranty to, or assumes any legal liability to the information contained herein other than that it has exercised reasonable skill, care and diligence in accordance with accepted practice and usual standards of thoroughness and competence for the profession of engineering to collect, assess and evaluate the information used in the preparation of this report. Responsibility for the acceptance and implementation of the recommendations made in this report lies solely with the client.

This report is based upon the information and conditions that were identified at the time of its sampling and preparation and is limited by any qualifications set out in the report. Any information or facts provided by others that have been referred to in the report, or utilized in its preparation are assumed to be accurate without any independent verification or confirmation by Nexo Solutions. Any similarity between this report and other reports may purely be coincidence.

Nexo Solutions does not accept any responsibility for the use of this report for any purpose other than as specifically stated in the report. Nexo Solutions does not have, does not assume, and does not accept, any responsibility or duty of care whether based in negligence or otherwise, in relation to the use of this report in whole or in Part by the client or any third Party. Any use by a third Party, including any reliance on or decision made based on this report, is the sole responsibility of the third Party. Nexo Solutions does not accept responsibility for any direct or indirect damages, if any, suffered by the client or any third Party as a result of decisions made or actions based on this report.

1. Project Background

The Bridgeton Landfill and Republic Services require removal of primarily dimethyl sulfide (DMS) contamination in a landfill gas (LFG) stream. The DMS contaminants are present in addition to a few other sulfur species. SCS Engineers and Nexo Solutions have evaluated a number of alternatives, and 2 technologies have shown adequate feasibility for effective total sulfur removal. It was recommended that field testing be pursued, and for 1 of the technologies, namely scrubbing followed by chemical oxidation (with 3 oxidant formulations), Nexo Solutions conducted the testing on-site with assistance from Republic and SCS. This report details the procedure, materials, results of testing, and other pertinent details related to on-site testing of the chemical scrubbing system conducted by Nexo.

2. Equipment & Materials

Nexo Solutions utilized a dual-stage chemical scrubber and 3 oxidizing agents for on-site testing as well as the necessary equipment for sulfur removal efficiency determination. The chemical scrubber used has the following specifications and is shown in the figure below.

- Maximum Flow Rate (CFM): 750
- Minimum Flow Rate (CFM): 50
- Flow meter not included (provided by SCS)
- Maximum Pressure (PSI): 3
- Maximum Temperature (F): 160
- Overall Unit Footprint (Scrubber Skid): 72”W x 74”L
- Empty Weight (Pounds): 1500
- Vapor Inlet: 6” Flange
- Vapor Outlet (From Scrubber Tower #2): 6” Flange
- Number of Towers: 2
- Tower Diameter (Inches): 20
- Packing Height (Feet): 10 (Total for Both Towers)
- Reservoir Capacity (Gallons): 450
- Liquid Fill Port: 2” Camlock Connection
- Number of Pumps: 2
- Unit Equipped with Mist Eliminator
- Liquids drain to bottom compartment
- Cleanout Ports on Scrubber Unit: 2 - 20” Vacuum Lids
- Re-Circulation Pump Type: Magnetic Drive Pumps
- Pressure Drop across System (@ 500 CFM): > 3” of water
- Utility Required for Primary Pump: Mag-Drive (460V, 3P)

The scrubber was operated at a flow rate roughly between 75 CFM and 150 CFM. The pressure was maintained under vacuum or slightly above, at a temperature between 70 F and 120 F, for essentially all of the testing process.

Ancillary equipment and materials provided by Nexo included:

- Caustic injection pump and hoses
- Gas sampling equipment (Tedlar bags, connections, and syringes)
- pH indicators
- Ozone generation system

Additional equipment and materials provided by SCS and Bridgeton included:

- Piping for the LFG slipstream and chemical additive disposal line, scrubber connections
- Chemical additives (established and discussed in a preceding technical report)
    - Sodium Hypochlorite 12.5% solution
    - Hydrogen Peroxide 32% solution
    - Sodium Hydroxide 50% solution
- Power availability
- Water availability

To quantify the levels of sulfur contamination in the landfill gas stream before and after treatment and determine the sulfur (and other odor components) removal efficiency of the test scrubber, an Agilent 490 Micro GC (Gas Chromatograph) was utilized. The micro GC is small, portable, and can be run on-site to generate results in less than 10 minutes after a sample is injected. The device was used to frequently measure the removal efficiency of the test scrubber at varying conditions and optimize those conditions based on the results generated. The micro GC consists of two channels constructed specifically for the separation, detection, and quantification of distinct components within the landfill gas stream. The channels and the relevant components that were quantified are presented in the table below.

Table 1. Compounds quantified by Agilent 490 Micro GC during on-site testing

Compounds Detected by Agilent 490 Micro GC		
Column:	**PPU 10m HI-BF(185)**	**13CB TBM HI-Str(262)**
Compound:	Nitrogen + Oxygen (Air)	Methyl Mercaptan
	Methane	Ethyl Mercaptan
	Carbon Dioxide	Dimethyl Sulfide
	Ethane	*n*-Butane[1]
	Hydrogen Sulfide	*i*-Butane[1]
	Propane	*n*-Pentane[1]
	Carbonyl Sulfide[2]	*i*-Pentane[1]
		C6+[1]
		n-Propyl Mercaptan[1]
		n-Butyl Mercaptan[1]
		t-Butyl Mercaptan[1]
		Tetrahydrothiophene[4]
		Methyl Ethyl Sulfide[1]
		Diethyl Sulfide[3]
		Dimethyl Disulfide[2]

Some components were not quantified during on-site testing due to:

1. Co-elution masking the actual signal of the desired component
2. Lack of GC calibration
3. The component was not present in the LFG
4. The component was not relevant to the on-site test

Some compounds in the table were not quantified due to various reasons as described in the table footnote. The majority of compounds that were not quantified were not detected accurately due to co-elution with other compounds from the GC column. This effect was unanticipated; a very high number of unknown components were found to be present in the LFG stream, thus making proper chromatography separation of certain compounds impossible. Other compounds were not quantified because they were not relevant to the on-site test or because they were not present in the LFG stream (or present at levels below detection limits).

Dimethyl Disulfide Analysis and Results

Under the current landfill gas conditions, the analysis of Dimethyl Disulfide (DMDS) could not be reported because of a number of aspects hindering accurate DMDS concentration determination. The Gas Chromatograph (GC) apparatus cannot properly detect DMDS in the complex landfill component matrix due to a high number of compounds causing interference via co-elution from the GC column. Also, the fact that the DMDS has a high boiling point (around 110 ^{o}C), causes a portion of the DMDS to condense when samples are taken prior to the gas analysis. DMDS is a liquid component at the process conditions, with some DMDS in equilibrium in the gas phase. This generated high variability in the gas analysis and corresponding results. Thus, both events combined hamper any correct and accurate DMDS analysis. Based on both aspects described earlier, DMDS results will not be reported.

Carbonyl sulfide and dimethyl disulfide were not detected due to a lack of GC calibration. The instrument had not yet been calibrated to identify or quantify these compounds. In the case of carbonyl sulfide, the concentration in the LFG stream based on previous analysis is below 1 ppm. Dimethyl disulfide however has a concentration of ~60 ppm in the LFG stream based on previous analysis. Due to this high level of DMDS and its relevance to on-site testing, an attempt was made to calibrate the GC for the compound and reinterpret the data collected on-site. It was discovered however that results for DMDS were erroneous as measured on both the GC used on-site as well as a 3rd party benchtop GC used to confirm the accuracy of all data collected (HP 6890N Series equipped with TCD and FPD detectors). It was identified that DMDS has a boiling point of 110 ^{o}C, and condensation of the compound within the sample bag and in the GC itself is thought to have been occurring over time. Repeated analysis of samples resulted in decreasing concentrations of DMDS as condensation of the compound occurs, leading to erroneous results. In addition, The Gas Chromatograph (GC) apparatus could not properly detect DMDS in the complex landfill component matrix due to a high number of compounds causing interference via co-elution from the GC column.

All other GC parameters were verified against a 3rd party benchtop GC after on-site testing was concluded and found to be correct and accurate. Inlet LFG samples were taken to analyze with a different GC as well as the GC used on-site. The results were the same or very similar for all relevant compounds detected, including H_2S, mercaptans, and DMS. The on-site GC calibration was also checked and compared to the 3rd party GC to confirm the accuracy of results collected on-site.

3. General Procedure

The equipment installation required prior to testing included piping of a slipstream from the main landfill gas (LFG) stream to the test unit area, setup of the test unit area, piping of a slipstream for LFG effluent from the test unit area to an appropriate line, and piping of a line for spent chemical solution to an appropriate line or tank. All test unit piping and equipment aspects were verified and finalized before and on the day of Nexo arrival for on-site testing. The chemical scrubber and all auxiliary components were fully prepared for operational use including utility connections (as required), slipstream piping, and equipment setup.

Test Unit Operation

Testing included start-up and operation of the pilot chemical scrubbing system as well as analysis of the inlet, intermediate, and effluent LFG streams by gas chromatography (GC). Each sample was captured in specialized containers (Tedlar bags for low pressure sampling) in order to ensure proper sample conservation. Samples were taken and analyzed each day of operation, at a rate between every 10 minutes and every half hour, at the test unit. GC analysis was handled by Nexo on-site. The results of GC analysis were used to quantify and speciate the components present in the LFG streams and calculate the sulfur component removal efficiency.

Temperature and pressure were monitored and considered in the evaluation of testing results. Other aspects monitored, evaluated, and optimized based on GC results include NaOH addition rate, oxidant solution recirculation rate, and gas flow rate. Efficiency was determined based on inlet and outlet DMS concentration (among other sulfur components).

The underlying premise behind each intended test scenario run time was not precisely determined, but was based on theoretical and expected consumption rates of the various oxidizing agents with sulfur compounds at the given flow rate and concentrations. These estimates did not account side reactions and faster than expected reagent consumption.

Testing Schedule

Day 1 – Verification of scrubber assembly and initial flow to scrubber, system stabilization, baseline gas analysis

Day 2 – Testing with NaOCl additive (dual stage batch testing of 300 gallons of chemical)

Day 3 – Cleanup of equipment associated with NaOCl additive, system stabilization, baseline gas analysis, data analysis, Testing with H_2O_2 additive (discontinued after start-up), “Bucket testing” of H_2O_2 additive with gas, condensate, and NaOH, cleanup of equipment associated with H_2O_2 additive

Day 4 – System stabilization, baseline gas analysis, data analysis, testing with water (dual stage batch testing of 300+ gallons of water), system purge/cleanup, testing with NaOCl additive (dual stage batch testing of 225+ gallons of water (1^{st} stage) and 150 gallons of chemical (2^{nd} stage)), cleanup of equipment associated with NaOCl additive

Day 5 – Testing with O_3 additive (dual stage batch testing of 300 gallons of water with ozone injection at gas inlet – 0.2-0.9 kg/hr O_3), system cleanup and shutdown

4. Results and Observations

Day 2 – Testing with NaOCl additive (dual stage batch testing of 300 gallons of chemical)

GC Testing Results

The results of gas testing (150 CFM) with NaOCl are presented in **Table 2** and **Table 3** below. Results for DMS concentration over time for all NaOCl tests performed during the on-site visit can be found in **Appendix A**. The LFG feed to the scrubber maintained a relatively consistent bulk composition and sulfur composition. The feed and effluent gas was measured to contain, on average, 52% N_2/O_2, 8% CH_4, and 27% CO_2. The remaining 13% of the bulk composition is believed to be predominantly H_2, which is not detected by the GC. It is also believed that the concentration of CO_2 may be higher and the concentration of N_2 may be lower, as the GC was not calibrated for these compounds at the levels in which they are present.

The originally planned testing procedure did include a test scenario at 300 SCFM LFG flow. This flow rate was not performed because of higher than anticipated chemical consumption rates.

Table 2. GC Results generated from Channel 1 (results in volume %)

Sample ID	N2/O2 (AIR)	Methane	CO2	Ethane	H2S	Propane
Inlet Gas - 2:19 pm	50.956	8.665	28.036	0.003	0.005	0.000 BDL*
Inlet Gas - 2:19 pm	50.948	8.679	28.209	0.003	0.006	0.003
1st Stage Gas Outlet - 2:19 pm	53.198	9.737	24.9	0.004	0.000 BDL	0.000 BDL
1st Stage Gas Outlet - 2:19 pm	53.166	9.74	24.946	0.003	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 2:19 pm	59.525	9.924	17.539	0.003	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 2:19 pm	59.685	9.934	17.602	0.003	0.000 BDL	0.000 BDL
Inlet Gas - 2:40 pm	50.072	8.886	29.549	0.003	0.002	0.000 BDL
Inlet Gas - 2:40 pm	49.949	8.878	29.539	0.004	N/A	0.000 BDL
1st Stage Gas Outlet - 2:40 pm	47.775	9.037	31.969	0.003	0.000 BDL	0.000 BDL
1st Stage Gas Outlet - 2:40 pm	47.694	9.028	31.974	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 2:40 pm	47.368	8.778	32.708	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 2:40 pm	47.301	8.778	32.767	0.004	0.000 BDL	0.000 BDL
Inlet Gas - 3:10 pm	48.546	9.147	30.244	0.003	0.04	0.000 BDL
Inlet Gas - 3:10 pm	48.697	9.162	30.246	0.003	0.005	0.000 BDL
1st Stage Gas Outlet - 3:10 pm	48.948	9.106	30.309	0.004	0.000 BDL	0.000 BDL
1st Stage Gas Outlet - 3:10 pm	48.875	9.095	30.3	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 3:10 pm	51.55	8.585	28.765	0.003	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 3:10 pm	51.528	8.582	28.783	0.003	0.000 BDL	0.000 BDL
SHUT DOWN TO IMPLEMENT PH ADJUSTMENT						
Inlet Gas - 5:15 pm	51.802	8.336	28.038	0.003	0.005	0.000 BDL
Inlet Gas - 5:15 pm	51.844	8.347	28.126	0.003	N/A	0.000 BDL
1st Stage Gas Outlet - 5:15 pm	50.749	8.643	28.836	0.003	0.000 BDL	0.000 BDL
1st Stage Gas Outlet - 5:15 pm	50.755	8.647	28.875	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 5:15 pm	52.304	8.332	27.772	0.003	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 5:15 pm	52.308	8.337	27.838	0.003	0.000 BDL	0.000 BDL
Inlet Gas - 6:00 pm	53.655	7.817	26.43	0.002	0.001	0.000 BDL

Inlet Gas - 6:00 pm	52.24	8.105	27.323	0.003	N/A	0.000 BDL
1st Stage Gas Outlet - 6:00 pm	80.065	1.862	5.639	0	0.000 BDL	0.000 BDL
1st Stage Gas Outlet - 6:00 pm	41.335	0.821	2.51	0	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 6:00 pm	52.43	8.147	27.842	0.003	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 6:00 pm	52.395	8.146	27.87	0.003	0.000 BDL	0.000 BDL
RECIRCULATION RATE INCREASED FROM 10 GPM TO 20 GPM						
Inlet Gas - 6:30 pm	51.422	8.329	28.464	0.003	0.008	0.000 BDL
Inlet Gas - 6:30 pm	51.358	8.325	28.482	0.004	0.008	0.000 BDL
1st Stage Gas Outlet - 6:30 pm	52.985	8.105	27.243	0.003	0.000 BDL	0.000 BDL
1st Stage Gas Outlet - 6:30 pm	53.037	8.116	27.318	0.003	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 6:30 pm	51.167	8.542	28.456	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 6:30 pm	51.038	8.543	28.479	0.004	0.000 BDL	0.000 BDL
Inlet Gas - 6:50 pm	51.424	8.241	28.377	0.004	0.008	0.000 BDL
Inlet Gas - 6:50 pm	51.506	8.253	28.431	0.003	0.009	0.000 BDL
1st Stage Gas Outlet - 6:50 pm	50.519	8.582	28.886	0.003	0.000 BDL	0.000 BDL
1st Stage Gas Outlet - 6:50 pm	50.485	8.575	28.91	0.003	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 6:50 pm	50.89	8.617	28.726	0.003	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 6:50 pm	50.764	8.601	28.705	0.003	0.000 BDL	0.000 BDL

*NOTE: BDL – Below Detection Limit (varies among compounds from 1 to 10 ppm)

H_2S concentrations were 88 ppm on average in the feed and 0 ppm at the outlet of the scrubber. The sulfur composition in the feed was primarily composed of DMS, at an average concentration of 1048 ppm. The remaining quantified sulfur composition was made of methyl mercaptan, at an average concentration of 114 ppm. Ethyl mercaptan was detected but at levels below quantification (< 1 ppm), and other mercaptans were not detected due interferences with unknown compounds. Undetected mercaptans are expected to be present at sub-ppm levels based on previous analysis. DMDS was not quantified, as the GC was not yet calibrated for this compound, and because calibration and reinterpretation of the data collected yielded erroneous results. DMDS is expected to be present at ~60 ppm levels on average at the inlet based on previous analysis.

Table 3. GC Results generated from Channel 2 (results in ppmv)

Sample ID	*Methanethiol (ppmv)	DMS (ppmv)
Inlet Gas - 2:19 pm	114.575	947.619
Inlet Gas - 2:19 pm	129.481	941.345
1st Stage Gas Outlet - 2:19 pm	0	195.444
1st Stage Gas Outlet - 2:19 pm	0	191.87
2nd Stage Gas Outlet - 2:19 pm	0	166.816
2nd Stage Gas Outlet - 2:19 pm	N/A	167
Inlet Gas - 2:40 pm	57.5	943.381
Inlet Gas - 2:40 pm	87	1072.561
1st Stage Gas Outlet - 2:40 pm	0	176.184
1st Stage Gas Outlet - 2:40 pm	0	201.331
2nd Stage Gas Outlet - 2:40 pm	0	161.271
2nd Stage Gas Outlet - 2:40 pm	0	178.819
Inlet Gas - 3:10 pm	114.3	1171.555
Inlet Gas - 3:10 pm	109.189	1074.549
1st Stage Gas Outlet - 3:10 pm	0	180.469
1st Stage Gas Outlet - 3:10 pm	0	183.336
2nd Stage Gas Outlet - 3:10 pm	0	164.869
2nd Stage Gas Outlet - 3:10 pm	0	177.449
SHUT DOWN TO IMPLEMENT PH ADJUSTMENT		

Inlet Gas - 5:15 pm	106.178	1070.143
Inlet Gas - 5:15 pm	109.8	1068.888
1st Stage Gas Outlet - 5:15 pm	38.4	972.221
1st Stage Gas Outlet - 5:15 pm	52.626	998.749
2nd Stage Gas Outlet - 5:15 pm	35.195	98.973
2nd Stage Gas Outlet - 5:15 pm	38.125	101.608
Inlet Gas - 6:00 pm	78.154	841.037
Inlet Gas - 6:00 pm	85.752	970.604
1st Stage Gas Outlet - 6:00 pm	59.245	685.455
1st Stage Gas Outlet - 6:00 pm	15.454	577.21
2nd Stage Gas Outlet - 6:00 pm	0.000 BDL	181.561
2nd Stage Gas Outlet - 6:00 pm	0.000 BDL	184.427
RECIRCULATION RATE INCREASED FROM 10 GPM TO 20 GPM		
Inlet Gas - 6:30 pm	133.764	1114.335
Inlet Gas - 6:30 pm	139.904	1153.619
1st Stage Gas Outlet - 6:30 pm	90.314	814.735
1st Stage Gas Outlet - 6:30 pm	98.972	940.377
2nd Stage Gas Outlet - 6:30 pm	97.51	1069.897
2nd Stage Gas Outlet - 6:30 pm	104.482	1180.147
Inlet Gas - 6:50 pm	133.148	1146.859
Inlet Gas - 6:50 pm	134.76	1086.976
1st Stage Gas Outlet - 6:50 pm	96.417	888.112
1st Stage Gas Outlet - 6:50 pm	100.9	999.277
2nd Stage Gas Outlet - 6:50 pm	99.683	897.792
2nd Stage Gas Outlet - 6:50 pm	100.264	1017.036

*NOTE: Methanethiol is also known as Methyl Mercaptan

The test was run from approximately 2:06 pm to 3:15 pm, at which point the system was shut down in order to implement pH adjustment. The pH was not initially adjusted to learn about the extent of pH variations upon start-up. After the caustic injection system was installed, the pH was controlled at approximately 6 using a 1.2 GPH injection rate. The test was restarted and ran from 4:15 pm to approximately 7:00 pm. Based on GC results for DMS concentration, it was determined that the NaOCl solution was spent at a time between 6:00 pm and 6:30 pm. The effluent DMS composition rose from ~180 ppm to ~1070 ppm, roughly the concentration of the feed.

Chemical Consumption Estimation

In an effective run time of 3.0-3.5 hours, 300 gallons of NaOCl were required to treat the gas stream at an approximate flow rate of 150 SCFM, at a DMS removal efficiency of 80-90%. Removal efficiencies for H_2S and methyl mercaptan were essentially 100% throughout the effective run time. The total amount of quantified sulfur components removed using 300 gallons of NaOCl was calculated to be roughly 4.5 lbs. This would equate to a usage of over 110,000 GPD chemical to treat the full LFG flow at equivalent efficiencies. Calculations for sulfur removal and chemical requirement can be found in the attached **Appendix B** spreadsheet (tab "Day 2"). This chemical usage is 14 times higher than what is expected from reaction of NaOCl with the present sulfur components. It is thus believed that there is an unknown reaction of component(s) in the LFG or its entrained condensate with the NaOCl that was rapidly consuming the chemical's activity for sulfur removal.

It was also suspected that acid components in the gas are reducing the pH of the solution and shifting the equilibrium of hypochlorite in solution to produce chlorine gas, thus reducing the chemical's activity for sulfur removal. pH was controlled during this experiment however and maintained at 6. As can be seen in **Figure 1** below, no chlorine gas should evolve from the solution at a pH of 6. The majority of hypochlorite should however exist in the protonated state, which reduces its reactivity with sulfur compounds. pH was controlled at a pH between 8 and 9 in further testing to shift equilibrium toward the unprotonated state, and these results are presented later in the report.

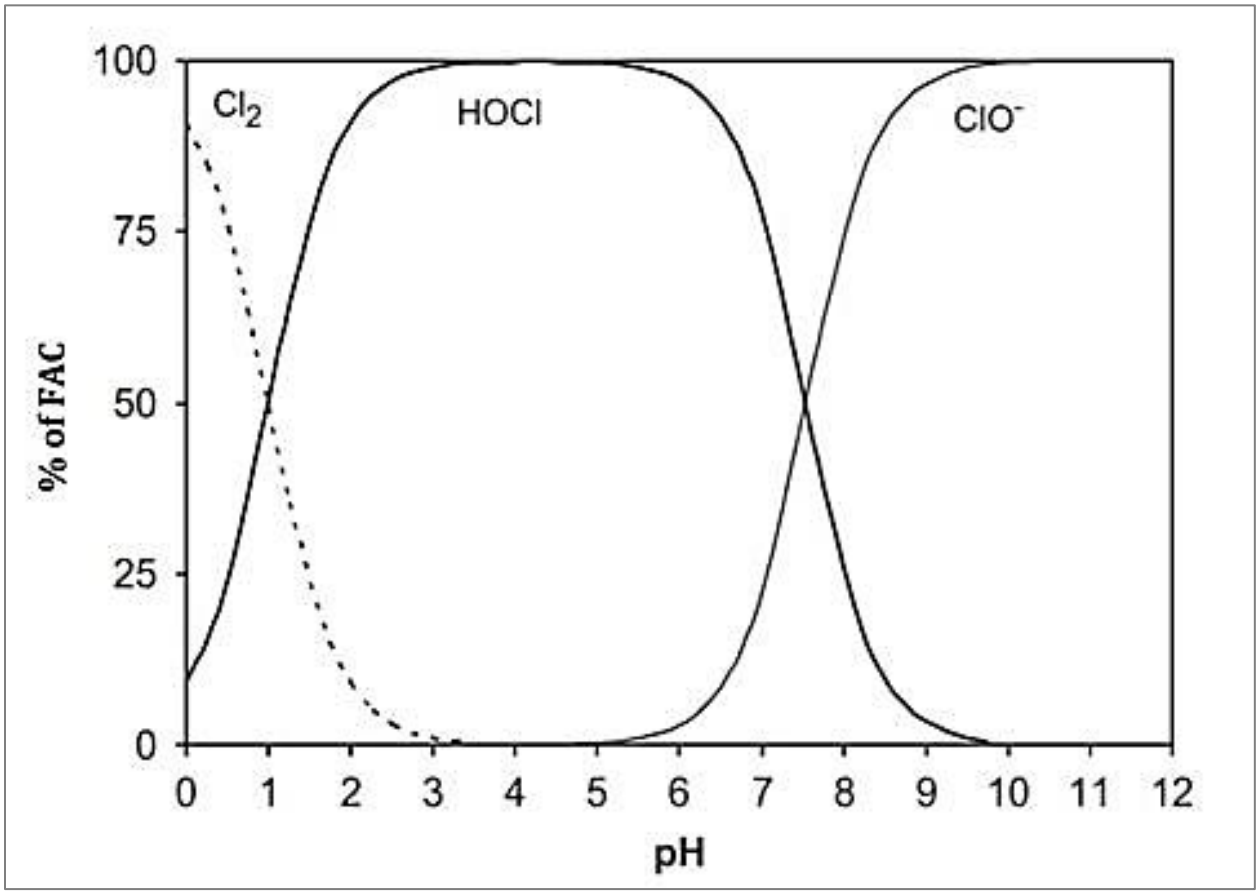


Figure 1. Equilibrium concentrations of the various states of sodium hypochlorite in solution as a function of pH

Day 3 - Testing with H_2O_2 (225+ gallons water (1st stage), 150 gallons H_2O_2 (2nd stage))

Test Start-up, Shutdown, and Discontinuation

Before testing with gas flow was initiated, water was pumped into the 1st stage scrubber sump and the H_2O_2 solution was pumped into the 2nd stage. It was observed that pressure within the closed system during chemical addition increased from 1.1 psig to 2.7 psig. After opening the vent to the sumps, the pressure within the system returned to atmospheric quickly. After discussion of implementing a pressure relief valve to the scrubber vent, it was decided to continue testing without it and to instead install a pressure gauge to the scrubber itself for manual monitoring.

The system was started with recirculation of the chemical solution at 15 GPM and then gas flow at 130 CFM at 4:15 pm. Shortly thereafter, it was noticed that the H_2O_2 solution was not being fully recirculated through the scrubber due to foam formation and gas entrainment within the liquid level. It was then noticed that the pressure within the scrubber was rising at a rapid rate to above 2 psig, and that the temperature was also rising rapidly to over 200 F. The feed gas to the scrubber was then closed immediately and the scrubber vent was opened. Pressure continued to build within the vessel after gas shutoff and vent opening for a short time. Temperature and pressure within the scrubber decreased to near atmospheric conditions after venting and LFG effluent suction emptied the vessel, and water was then added to the sumps to cool down the scrubber. The H_2O_2 reaction is known to be exothermic; however, H_2O_2 has been used extensively and safely in similar applications. The nature of the observed strong and delayed reaction is still under investigation. This reaction does not fall under normal H_2O_2 reaction behavior.

Due to the rapid escalation in pressure observed during this period, further testing using H_2O_2 in the scrubber was discontinued for a number of reasons, primarily the low pressure rating of the scrubber and the associated safety concerns with over-pressuring the vessel. Controlled bucket small scale testing (1/2 to 1 gallon liquid volumes) was performed instead in order to understand the cause of the rapid escalation in pressure and temperature during scrubber operation, and continued testing with NaOCl was performed the next day in place of testing with H_2O_2/O_3.

GC Testing Results

The results of gas testing with H_2O_2 are presented in **Table 4** and **Table 5** below. The absence of more complete results is due to discontinuation of testing shortly after system start-up.

The feed and effluent gas was measured to contain, on average, 47% N_2/O_2, 9% CH_4, and 31% CO_2. The remaining 13% of the bulk composition is believed to be predominantly H_2, which is not detected by the GC. It is also believed that the concentration of CO_2 may be higher and the concentration of N_2 may be lower, as the GC was not calibrated for these compounds at the levels in which they are present.

Table 4. GC Results generated from Channel 1 (results in volume %)

Sample ID	N2/O2 (AIR)	Methane	CO2	Ethane	H2S	Propane
Inlet Gas 4:30 pm	47.165	9.33	30.485	0.004	0.006	0.006
Inlet Gas 4:30 pm	47.086	9.337	30.622	0.004	0.008	0.004
1st Stage Outlet 4:30 pm	47.168	9.458	30.584	0.003	0.006	0.000 BDL
1st Stage Outlet 4:30 pm	47.306	9.482	30.653	0.003	0.007	0.000 BDL
2nd Stage Outlet 4:30 pm	46.915	9.469	30.791	0.004	0.003	0.006
2nd Stage Outlet 4:30 pm	46.866	9.46	30.768	0.004	0.003	0.005

H_2S concentrations were 70 ppm on average in the feed and 30 ppm at the outlet of the scrubber. The sulfur composition in the feed was primarily composed of DMS, at an average concentration of 1059 ppm. The remaining quantified sulfur composition was made of methyl mercaptan, at an average concentration of 129 ppm. Ethyl mercaptan was detected in some

cases but at levels below quantification (< 1 ppm), and other mercaptans were not detected due to interferences with unknown compounds or their lack of presence in the gas.

Table 5. GC Results generated from Channel 2 (results in ppmv)

Sample ID	Methanethiol (ppmv)	DMS (ppmv)
Inlet Gas 4:30 pm	115.42	1023.011
Inlet Gas 4:30 pm	142.63	1095.677
1st Stage Outlet 4:30 pm	113.589	636.078
1st Stage Outlet 4:30 pm	125.412	689.003
2nd Stage Outlet 4:30 pm	74.118	286.287
2nd Stage Outlet 4:30 pm	81.857	338.202

The measured removal efficiency for all detected sulfur components was approximately 70%, although only one set of data was collected due to the short run time. It should also be noted that some DMS was removed by water in the first stage of the scrubber, and H_2O_2 further removed DMS to achieve 70% overall removal. The chemical consumption and efficiency over time could not be measured.

Controlled Bucket Small Scale Testing

It was hypothesized that there is an unknown reaction of component(s) in the LFG or its entrained condensate with the H_2O_2 that is highly exothermic, evolves gas, and caused the rapid escalation in pressure and temperature in the scrubber during operation. It was thus decided to undertake a series of controlled bucket tests to recreate the event that occurred during scrubber operation in a safe, observable plastic container wherein process variables can be controlled and manipulated. The conditions for each test and the results observed are shown below in **Table 6**.

Table 6. Bucket testing conditions, results, and observations

Conditions	Result	Observations
H_2O_2 + Caustic	No Reaction	A small amount of caustic was added to excess H_2O_2
H_2O_2 + Bleach	Mild Reaction	Instantaneous reaction, minimal gas evolution or foaming, small increase in temperature (bucket wall warm to touch)
1:1 H_2O_2 /NaOCl + Caustic	Reaction	H_2O_2 and NaOCl were mixed approximately 1:1 ratio in a bucket, then a small amount of caustic was added; instantaneous but short (seconds) reaction, initially high gas evolution / foaming, small increase in temperature (bucket wall warm to touch)
50:1 H_2O_2 /NaOCl + Caustic	No Reaction	H_2O_2 and NaOCl were mixed approximately 50:1 ratio in a bucket, then a small amount of caustic was added
H_2O_2 + Water from Sump 1 + Caustic	Strong Reaction	Delayed and long (minutes) reaction, steady gas evolution and high foaming (stable foam), high increase in temperature (bucket wall was very hot to touch)
H_2O_2 + LFG + Condensate + Caustic	Strong Reaction after 28 minutes	Condensate was drain from LFG pipe low point, LFG feed was bubbled continuously into the solution; delayed and long (minutes) reaction, steady gas evolution and high foaming (stable foam), high increase in temperature (bucket wall was very hot to touch)
H_2O_2 + LFG + Caustic	No Reaction	LFG fed continuously from high point in gas line to avoid condensate ingression

NaOCl was incorporated in some of the tests performed to determine the possibility that leftover NaOCl contamination in the scrubber reacted with H_2O_2 and/or other components. It was determined from the testing that although bleach does seem to react with H_2O_2 and

caustic, the reaction is instantaneous and mild in comparison to that seen during scrubber operation; in addition, no observable reaction occurred when using dilute amounts of NaOCl. Reaction of the H_2O_2 and caustic additives alone was also ruled out.

It was observed that a delayed and highly exothermic reaction occurred in tests that included the addition of caustic and either water from the 1st stage sump or condensate from the LFG stream to an H_2O_2 solution. After several minutes without any sign of reaction, both of these tests resulted in a prolonged reaction that lasted over 2 minutes in time. The reaction gave off a significant amount of heat, and stable foam was produced that expanded an order of magnitude beyond the liquid volume. The delayed reaction, high amount of heat released, and foam/gas produced are all similar to that observed during scrubber operation.

A final experiment was performed using H_2O_2, caustic, and LFG without any condensate; the lack of reaction suggests that the reaction occurring during scrubber operation and previous bucket tests did not involve the gaseous and non-water soluble components of the LFG stream.

Day 4 – Testing with Water (dual stage batch testing of 300+ gallons of water)

GC Testing Results

The results of the gas testing using only water are presented in **Table 7** and **Table 8** below. Water was used as a test solution after observing sulfur removal in water from the 1st sump during testing with H_2O_2 (see Table 5). The LFG feed to the scrubber maintained a relatively consistent bulk composition and sulfur composition. The feed and effluent gas was measured to contain, on average, 47% N_2/O_2, 10% CH_4, and 32% CO_2. The remaining 11% of the bulk composition is believed to be predominantly H_2, which is not detected by the GC. It is also believed that the concentration of CO_2 may be higher and the concentration of N_2 may be lower, as the GC was not calibrated for these compounds at the levels in which they are present.

Table 7. GC Results generated from Channel 1 (results in volume %)

Sample ID	N2 (AIR)	Methane	CO2	Ethane	H2S	Propane
Inlet Gas - 2:00 pm	48.122	9.356	31.221	0.004	0.006	0.000 BDL
Inlet Gas - 2:00 pm	48.1	9.354	31.24	0.004	0.007	0.000 BDL
1st Stage Gas Outlet - 2:00 pm	48.809	9.344	31.036	0.004	0.006	0.000 BDL
1st Stage Gas Outlet - 2:00 pm	48.692	9.331	31.073	0.004	0.006	0.000 BDL
2nd Stage Gas Outlet - 2:00 pm	46.869	9.435	31.234	0.004	0.006	0.000 BDL
2nd Stage Gas Outlet - 2:00 pm	47.304	9.532	31.589	0.004	0.006	0.000 BDL
Inlet Gas - 2:50 pm	46.995	9.565	32.122	0.004	0.007	0.000 BDL
Inlet Gas - 2:50 pm	46.964	9.56	32.119	0.007	0.007	0.000 BDL
1st Stage Gas Outlet - 2:50 pm	47.776	9.508	31.684	0.004	0.006	0.000 BDL
1st Stage Gas Outlet - 2:50 pm	47.7	9.501	31.738	0.004	0.007	0.000 BDL
2nd Stage Gas Outlet - 2:50 pm	47.546	9.535	31.902	0.004	0.006	0.000 BDL
2nd Stage Gas Outlet - 2:50 pm	47.35	9.526	31.916	0.004	0.006	0.000 BDL
Inlet Gas - 3:45pm	47.724	9.586	31.603	0.004	0.007	0.000 BDL
Inlet Gas - 3:45pm	47.608	9.563	31.563	0.004	0.007	0.000 BDL
1st Stage Gas Outlet - 3:45pm	47.617	9.58	31.678	0.003	0.006	0.000 BDL
1st Stage Gas Outlet - 3:45pm	47.493	9.569	31.719	0.004	0.007	0.000 BDL
2nd Stage Gas Outlet - 3:45pm	47.503	9.609	31.911	0.004	0.007	0.004
2nd Stage Gas Outlet - 3:45pm	47.447	9.606	31.893	0.003	0.007	0.000 BDL

NEW TEST						
Inlet Gas - 5:05pm	47.362	9.58	31.607	0.004	0.007	0.000 BDL
Inlet Gas - 5:05pm	47.347	9.581	31.627	0.003	0.007	0.000 BDL
2nd Stage Gas Outlet - 5:05pm	46.846	9.722	31.772	0.004	0.006	0.000 BDL
2nd Stage Gas Outlet - 5:05pm	46.848	9.725	31.873	0.004	0.006	0.000 BDL
2nd Stage Gas Outlet - 5:15pm	46.681	9.714	32.225	0.003	0.006	0.000 BDL
2nd Stage Gas Outlet - 5:15pm	46.553	9.713	32.248	0.004	0.006	0.000 BDL
2nd Stage Gas Outlet - 5:25pm	46.815	9.673	32.094	0.004	0.006	0.000 BDL
2nd Stage Gas Outlet - 5:25pm	46.752	9.672	32.166	0.004	0.007	0.000 BDL
2nd Stage Gas Outlet - 5:35pm	46.733	9.712	32.209	0.015	0.007	0.000 BDL
2nd Stage Gas Outlet - 5:35pm	46.59	9.704	32.164	0.003	0.007	0.000 BDL
2nd Stage Gas Outlet - 5:45pm	46.1	9.741	32.497	0.003	0.007	0.000 BDL
2nd Stage Gas Outlet - 5:45pm	46.169	9.738	32.572	0.004	0.007	0.000 BDL
2nd Stage Gas Outlet - 5:55pm	46.65	9.697	32.272	0.004	0.007	0.000 BDL
2nd Stage Gas Outlet - 5:55pm	46.521	9.692	32.299	0.004	0.007	0.000 BDL
2nd Stage Gas Outlet - 6:05pm	46.296	9.727	32.376	0.004	0.007	0.000 BDL
2nd Stage Gas Outlet - 6:05pm	46.264	9.728	32.468	0.004	0.007	0.000 BDL
2nd Stage Gas Outlet - 6:15pm	46.352	9.707	32.357	0.004	0.007	0.000 BDL
2nd Stage Gas Outlet - 6:15pm	46.416	9.713	32.414	0.004	0.007	0.004
2nd Stage Gas Outlet - 6:25pm	45.857	9.719	32.643	0.003	0.007	0.000 BDL
2nd Stage Gas Outlet - 6:25pm	45.785	9.722	32.708	0.004	0.007	0.000 BDL

H_2S concentrations were 70 ppm on average in the feed and outlet of the scrubber. The sulfur composition in the feed was primarily composed of DMS, at an average concentration of 1174 ppm. The remaining quantified sulfur composition was made of methyl mercaptan, at an average concentration of 151 ppm. Ethyl mercaptan was detected but at levels below quantification (< 1 ppm), and other mercaptans were not detected due interferences with unknown compounds.

Table 8. GC Results generated from Channel 2 (results in ppmv)

Sample ID	Methanethiol	DMS
Inlet Gas - 2:00 pm	144.315	1074.779
Inlet Gas - 2:00 pm	142.703	1182.941
1st Stage Gas Outlet - 2:00 pm	110.068	515.584
1st Stage Gas Outlet - 2:00 pm	117.905	595.35
2nd Stage Gas Outlet - 2:00 pm	109.234	429.946
2nd Stage Gas Outlet - 2:00 pm	122.462	475.031
Inlet Gas - 2:50 pm	155.528	1221.649
Inlet Gas - 2:50 pm	165.083	1328.435
1st Stage Gas Outlet - 2:50 pm	144.444	1022.676
1st Stage Gas Outlet - 2:50 pm	153.943	1162.368
2nd Stage Gas Outlet - 2:50 pm	151.553	1059.538
2nd Stage Gas Outlet - 2:50 pm	165.206	1092.056
Inlet Gas - 3:45pm	151.861	1098.576
Inlet Gas - 3:45pm	150.82	1198.91
1st Stage Gas Outlet - 3:45pm	142.966	1058.229
1st Stage Gas Outlet - 3:45pm	144.791	1168.673
2nd Stage Gas Outlet - 3:45pm	155.085	1007.555
2nd Stage Gas Outlet - 3:45pm	161.607	1073.152
NEW TEST		
Inlet Gas - 5:05pm	149.56	1128.201
Inlet Gas - 5:05pm	148.189	1158.171
2nd Stage Gas Outlet - 5:05pm	97.125	361.668

2nd Stage Gas Outlet - 5:05pm	98.868	363.654
2nd Stage Gas Outlet - 5:15pm	129.414	537.256
2nd Stage Gas Outlet - 5:15pm	130.243	570.277
2nd Stage Gas Outlet - 5:25pm	132.504	572.679
2nd Stage Gas Outlet - 5:25pm	139.227	630.72
2nd Stage Gas Outlet - 5:35pm	135.712	700.802
2nd Stage Gas Outlet - 5:35pm	146.554	723.552
2nd Stage Gas Outlet - 5:45pm	163.622	863.17
2nd Stage Gas Outlet - 5:45pm	163.101	900.408
2nd Stage Gas Outlet - 5:55pm	151.195	785.711
2nd Stage Gas Outlet - 5:55pm	155.785	853.694
2nd Stage Gas Outlet - 6:05pm	146.806	790.279
2nd Stage Gas Outlet - 6:05pm	156.127	886.255
2nd Stage Gas Outlet - 6:15pm	153.54	899.77
2nd Stage Gas Outlet - 6:15pm	151.256	954.008
2nd Stage Gas Outlet - 6:25pm	162.889	1046.221
2nd Stage Gas Outlet - 6:25pm	175.819	1061.207

The tests were run from approximately 1:55 pm to 3:50 pm and 5:00 pm to 6:30 pm. The water recirculation rate was set at 25 GPM in both towers, and the gas flow was set at ~75 CFM. Based on GC results for DMS concentration, it was determined that the water solutions were spent in both tests after 1.5 hours or less. The effluent gas sulfur compositions rose from ~560 ppm in the 1st test and ~360 ppm in the 2nd test to ~1050-1100 ppm, roughly the concentration of the feed gas.

Chemical Consumption Estimation

In an effective run time of 1.0-1.5 hours, 300 gallons of water were required to treat the gas stream at an approximate flow rate of 75 SCFM, at a DMS removal efficiency below 65%. Removal efficiencies for H_2S and methyl mercaptan were essentially 0% throughout the effective run time. The reasoning behind the observed DMS removal without simultaneous removal of H_2S and mercaptans is not clear, but one possibility may relate to the DMS concentration relative to other sulfur compounds. The high concentration of DMS in the gas may cause some partitioning into the aqueous phase, as DMS is sparingly soluble (2% w/v or 20,000 ppmV) in water. At low concentrations, the partitioning of H_2S and mercaptans however is likely to be unfavorable thermodynamically. Another possibility is that DMS condensation is favored upon washing with water, as the component has a boiling point of 99 F that is very near the LFG stream inlet temperature. Any cooling or increase in pressure may cause DMS to condense.

The total amount of sulfur components removed during this test was not exactly quantified, but the usage rates required far exceeded that of previous tests using oxidant solutions. The use of only water for sulfur removal is a potential option, but further treatment of the water to neutralize DMS and other sulfur compounds would likely be necessary.

Day 4 - Testing with NaOCl (225+ gallons water - 1st stage, 150 gallons NaOCl - 2nd stage)

GC Testing Results

The results of the 2nd round of gas testing with NaOCl are presented in **Table 9** and **Table 10** below. In this test, wash water was used in the first stage to remove any water soluble components or liquids that may react or deactivate the NaOCl causing over consumption. The wash water was drained and refilled simultaneously at distinct periods during the test, and maintained at a volume of ~225 gallons. 150 gallons of NaOCl was used in the 2nd stage of the scrubber. The flow rate was initiated at ~75 CFM and increased to ~150 CFM after 10 minutes runtime.

The LFG feed to the scrubber maintained a relatively consistent bulk composition and sulfur composition. Significantly higher concentrations of N_2/O_2 and lower concentrations of CO_2 were initially observed in the gas outlet, potentially due to O_2 release from the oxidant chemistry and/or CO_2 dissolution into the aqueous solutions. It is more likely that the level of N_2 or O_2 rose, and CO_2 levels were only lower due to dilution. It is possible that O_2 gas was evolved upon startup, as NaOCl decomposes and forms hydroxyl radicals in solution that can self-react to form O_2. This effect would be more pronounced during start-up, when agitation via recirculation occurs and energy is imparted to the system. A leak during sampling or GC injection may also be possible. Excluding these results, the feed and effluent gas was measured to contain, on average, 47% N_2/O_2, 10% CH_4, and 32% CO_2. The remaining 11% of the bulk composition is believed to be predominantly H_2.

Table 9. GC Results generated from Channel 1 (results in volume %)

Sample ID	N2/O2 (AIR)	Methane	CO2	Ethane	H2S	Propane
Inlet Gas - 7:20pm	45.664	9.794	32.598	0.004	0.007	0.000 BDL
Inlet Gas - 7:20pm	45.613	9.791	32.607	0.004	0.006	0.004
1st Stage Gas Outlet - 7:20pm	46.455	9.716	32.164	0.004	0.008	0.000 BDL
1st Stage Gas Outlet - 7:20pm	46.455	9.723	32.236	0.004	0.006	0.004
2nd Stage Gas Outlet - 7:20pm	61.094	10.584	15.489	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 7:20pm	61.051	10.586	15.519	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 7:30pm	51.296	10.104	26.107	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 7:30pm	51.312	10.106	26.148	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 7:50pm	47.143	9.647	31.751	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 7:50pm	47.144	9.649	31.773	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 8:10pm	47.28	9.721	31.472	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 8:10pm	47.18	9.717	31.515	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 8:30pm	46.711	9.772	31.817	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 8:30pm	46.552	9.762	31.791	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 8:50pm	46.787	9.699	31.8	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 8:50pm	46.664	9.693	31.828	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 9:10pm	46.692	9.73	32.035	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 9:10pm	46.552	9.721	32.062	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 9:30pm	47.025	9.695	31.748	0.003	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 9:30pm	46.922	9.688	31.727	0.004	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 9:50pm	47.376	9.679	31.497	0.003	0.000 BDL	0.000 BDL
2nd Stage Gas Outlet - 9:50pm	47.393	9.683	31.6	0.004	0.000 BDL	0.000 BDL

H_2S concentrations were 65 ppm in the feed and 0 ppm at the outlet of the scrubber. The sulfur composition in the feed was primarily composed of DMS, at an average concentration of 1159 ppm. The remaining quantified sulfur composition was made of methyl mercaptan, at an average concentration of 155 ppm. Ethyl mercaptan was detected at an inlet concentration of

3.4 ppm, and other mercaptans were not detected due to interferences with unknown compounds or a lack of presence in the gas.

Table 10. GC Results generated from Channel 2 (results in ppmv)

Sample ID	Methanethiol (ppmv)	Ethanethiol (ppmv)	DMS (ppmv)
Inlet Gas - 7:20pm	146.163	6.843	1135.793
Inlet Gas - 7:20pm	163.029	0	1183.014
1st Stage Gas Outlet - 7:20pm	135.348	0	705.286
1st Stage Gas Outlet - 7:20pm	149.37	5.23	754.59
2nd Stage Gas Outlet - 7:20pm	0	0	31.11
2nd Stage Gas Outlet - 7:20pm	0	0	52.77
2nd Stage Gas Outlet - 7:30pm	0	7.492	72.154
2nd Stage Gas Outlet - 7:30pm	0	3.923	76.135
2nd Stage Gas Outlet - 7:50pm	0	5.429	160.481
2nd Stage Gas Outlet - 7:50pm	0	6.701	157.096
2nd Stage Gas Outlet - 8:10pm	0	0	197.145
2nd Stage Gas Outlet - 8:10pm	0	4.735	191.452
2nd Stage Gas Outlet - 8:30pm	0	0	139.288
2nd Stage Gas Outlet - 8:30pm	0	0	149.699
2nd Stage Gas Outlet - 8:50pm	0	0	176.654
2nd Stage Gas Outlet - 8:50pm	0	0	189.07
2nd Stage Gas Outlet - 9:10pm	0	0	326.416
2nd Stage Gas Outlet - 9:10pm	0	0	349.259
2nd Stage Gas Outlet - 9:30pm	71.35	4.216	857.728
2nd Stage Gas Outlet - 9:30pm	92.948	10.958	900.162
2nd Stage Gas Outlet - 9:50pm	107.617	0	1122.78
2nd Stage Gas Outlet - 9:50pm	122.921	0	1168.709

The caustic injection system was used to control the pH at 8-9 using a 6 GPH injection rate. The test was run from approximately 7:15 pm to 10:00 pm, at which point the system was shut down. Based on GC results for DMS concentration, it was determined that the NaOCl solution was spent at a time between 9:30 pm and 9:50 pm. The effluent gas sulfur compositions rose from ~900 ppm to ~1170 ppm, roughly the concentration of the feed gas.

Chemical Efficiency and Consumption Estimation

In an effective run time of 2.75 hours, 150 gallons of NaOCl were required to treat the gas stream at an approximate flow rate of 150 SCFM, at a DMS removal efficiency above 80% for the majority of testing (~55 gallons/hr). It should also be noted that some DMS was removed by water in the first stage of the scrubber, and NaOcl further removed DMS to achieve > 80% overall removal. Removal efficiencies for H_2S and methyl mercaptan were essentially 100% throughout the effective run time. Ethyl mercaptan removal was sporadic throughout testing.

The total amount of quantified sulfur components removed using 150 gallons of NaOCl was calculated to be roughly 4.3 lbs. This would equate to a usage of over 65,000 GPD chemical to treat the full LFG flow at equivalent efficiencies. Calculations for sulfur removal and chemical requirement can be found in the attached **Appendix B** spreadsheet (tab "Day 4"). This chemical usage is about 8 times higher than what is expected from reaction of NaOCl with the present sulfur components. It is thus believed that there is an unknown reaction of component(s) in the

LFG or its entrained condensate with the NaOCl that was rapidly consuming the chemical's activity for sulfur removal.

Day 5 - Testing with O_3 (dual stage batch testing of 300+ gallons of water)

GC Testing Results

The results of gas testing with water and O_3 are presented in **Table 11** and **Table 12** below. The LFG feed to the scrubber maintained a relatively consistent bulk composition and sulfur composition. The feed and effluent gas was measured to contain, on average, 48% N_2/O_2, 9% CH_4, and 31% CO_2. The remaining 12% of the bulk composition is believed to be predominantly H_2, which is not detected by the GC. It is also believed that the concentration of CO_2 may be higher and the concentration of N_2 may be lower, as the GC was not calibrated for these compounds at the levels in which they are present.

Table 11. GC Results generated from Channel 1 (results in volume %)

Sample ID	N2 (AIR)	Methane	CO2	Ethane	H2S	Propane
Inlet Gas - 11:00 am	48.156	9.269	31.211	0.004	0.006	0.000 BDL
Inlet Gas - 11:00 am	48.056	9.257	31.245	0.004	0.007	0.000 BDL
1st Stage Outlet - 11:00 am (90% Capacity)	49.705	9.074	30.161	0.004	0.006	0.000 BDL
2nd Stage Outlet - 11:00 am (90% Capacity)	47.164	9.416	31.151	0.004	0.005	0.000 BDL
2nd Stage Outlet - 11:05 am (20% Capacity)	47.891	9.441	31.384	0.004	0.006	0.000 BDL
2nd Stage Outlet - 11:20 am (90% Capacity)	48.942	9.223	30.732	0.004	0.006	0.000 BDL
2nd Stage Outlet - 11:40 am (20% Capacity)	47.908	9.477	31.361	0.004	0.005	0.000 BDL

H_2S concentrations were 65 ppm on average in the feed and ~55 ppm at the outlet of the scrubber. The sulfur composition in the feed was primarily composed of DMS, at an average concentration of 1129 ppm. The remaining quantified sulfur composition was made of methyl mercaptan, at an average concentration of 152 ppm. Methyl mercaptan was not removed during testing to any significant extent. Ethyl mercaptan was detected but at levels below quantification (< 1 ppm) in most cases, and other mercaptans were not detected due interferences with unknown compounds.

Table 12. GC Results generated from Channel 2 (results in ppmv)

Sample ID	Methanethiol	DMS
Inlet Gas - 11:00 am	147.752	1062.572
Inlet Gas - 11:00 am	155.354	1195.436
1st Stage Outlet - 11:00 am (90% Capacity)	143.481	136.649
2nd Stage Outlet - 11:00 am (90% Capacity)	91.325	155.226
2nd Stage Outlet - 11:05 am (20% Capacity)	114.334	429.915
2nd Stage Outlet - 11:20 am (90% Capacity)	152.074	244.358
2nd Stage Outlet - 11:40 am (20% Capacity)	136.075	829.359

The test was run from approximately 11:00 am to 11:45 am, at which point the system was shut down. Based on GC results for DMS concentration, it was determined that the water solution with O_3 could reach a maximum removal efficiency of approximately 85%. The effluent gas

sulfur compositions were reduced to ~150 ppm from ~1100 ppm at 90% O_3 capacity, which equates to an injection rate of 0.9 kg/h O_3.

The capacity of the system is related only to water usage, as O_3 was continuously produced from a generator. This would also be the case in a full scale operation, and liquid oxygen would not be required as air could be used with a more flexible, larger unit. The water usage of the system was not determined, and further testing over a longer treatment period would be required to do so. The results of earlier testing with water in both scrubber stages can be used to estimate high water requirements, but it is unclear if reaction of sulfur compounds with O_3 would reduce this requirement. Reaction of sulfur components with O_3 should produce byproducts with higher solubility in water relative to the reactants, thus increasing the capacity of water to remove the components and decrease overall water consumption.

Activated Carbon Testing (Proof of Concept only)

A proof of concept using of activated carbon for DMS removal was also explored by passing a small stream of LFG through tubing to a small activated carbon bed (capsule). Analysis of gas samples taken with and without an activated carbon filter showed significant removal efficiency for DMS. It is known that activated carbon can effectively remove H_2S and mercaptans, but high efficacy for alkyl sulfides and disulfides removal has not been well documented. The activated carbon bed was protected with a pre-filter for solids and water removal. The test was qualitative, as the flow rate of LFG and the mass of activated carbon used was not quantifiable. The results of this test are depicted in **Figure 2** and **Table 13**.

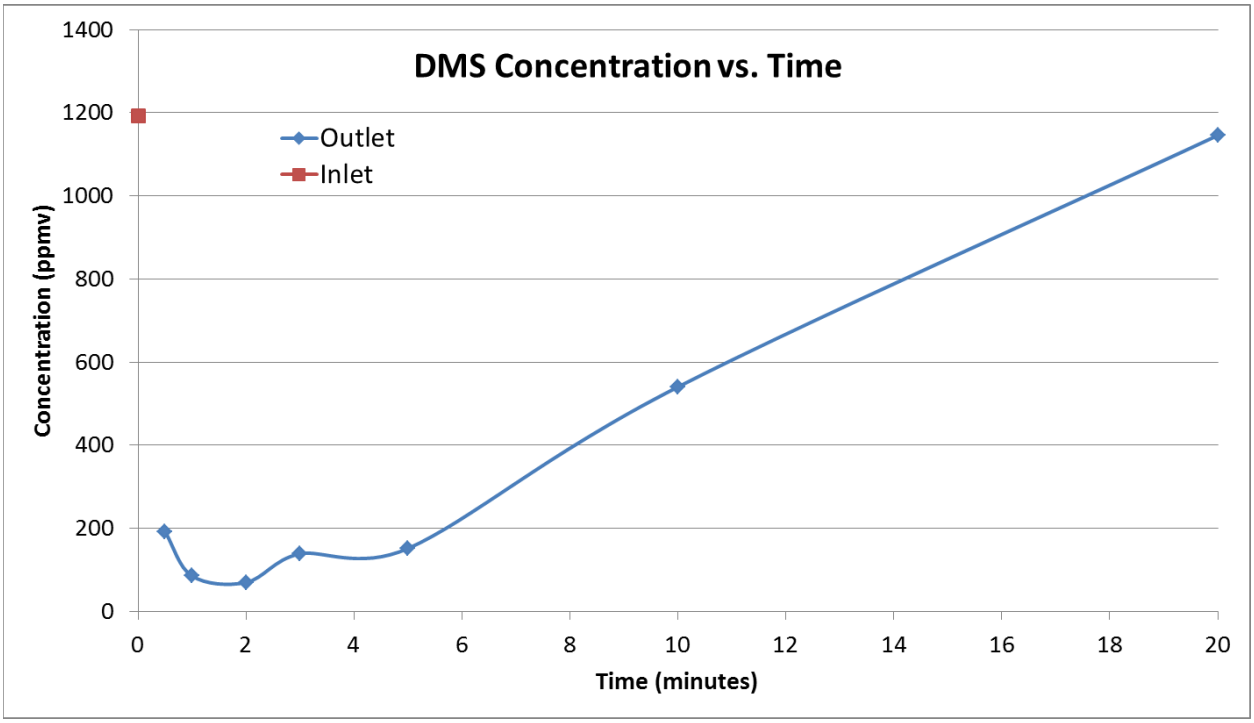


Figure 2. Concentration of DMS over time during treatment with activated carbon

Table 13. Concentration of DMS over time during treatment with activated carbon

Treatment Time	DMS Concentration (ppm)	Removal Efficiency
NONE	1192.526	0.00%
0.5	192.009	83.90%
1	85.466	92.83%
2	69.961	94.13%
3	139.145	88.33%
5	151.857	87.27%
10	540.474	54.68%
20	1145.708	3.93%

The finite amount of activated carbon was spent after 20 minutes of run time. The removal efficiency of DMS was initially 84% and rose to as high as 94% after 2 minutes before gradually declining to 4% after 20 minutes, at which point the carbon was considered spent and the test was stopped. While the capacity of activated carbon to remove DMS was not quantified, it was qualified that activated carbon can efficiently remove the component. H_2S and mercaptans were also removed at essentially 100% efficiency for the 20 minute test period. It is hence determined that activated carbon could potentially be a suitable solution for sulfur removal in the LFG stream, but the amount of activated carbon needed to remove the required amount of sulfur must be quantified. There is a strong possibility that activated carbon capacity would be used up by a number of non-sulfur components in the LFG stream, and the amount of carbon needed for effective sulfur removal would thus be very high. In addition, activated carbon does not oxidize DMS, and further treatment of the spent carbon to neutralize it permanently may be required. It is recommended that further testing with activated carbon be performed in order to quantify its capacity for total sulfur removal.

5. Sodium Hypochlorite (NaClO) Oxidation of DMS

The reaction for sodium hypochlorite formation (eq. 1) and the oxidation of DMS (eq. 1) are shown below.

$$2\ NaOH + Cl_2 \rightarrow NaClO + NaCl + H_2O \qquad \text{(eq. 1)}$$

$$CH_3\text{-}S\text{-}CH_3 + NaClO \rightarrow NaCl + CH_3\text{-}SO\text{-}CH_3 \qquad \text{(eq. 2)}$$

The oxidation of DMS forms DMSO (dimethylsulfoxide), a water soluble, protic and polar molecule. The reaction molar ratio occurs on a 1:1 ration if only the sulfoxide is formed. From the reaction equation (eq. 2), it is possible to determine the theoretical amount of oxidant (NaClO) to be used.

<u>Theoretical Dosage Calculation</u>

- Gas Flow Calculation Basis (SCFM): 150
- Gas Flow (MMSCFD): 0.216

Component	MW	Component Flow (SCFD)	Component Concentration (ppm)	Component Flow (mol/d)
Dimethyl sulfide (DMS)	62.13	204.768	948	244.8
Ethyl mercaptan	62.13	0.216	1	0.26
Diethyl sulfide	90.19	0.043	0.2	0.05
Dimethyl disulfide	94.2	6.59	31	7.87
Methyl ethyl sulfide	76.16	0.432	2	0.52
Hydrogen sulfide	34.08	3.672	17	4.39
Isopropyl mercaptan	76.16	0.108	0.5	0.13
Methyl mercaptan	48.11	37.8	175	45.11
Total Oxidizable Sulfur Components (mol/d):				**303.16**

The total sulfur species subjected to oxidation is 303.16 moles per day. This equates to 12.63 moles per hour. The sodium hypochlorite (NaOCl) solution at 12.5% concentration has a total of 6.36 moles of oxidant per gallon. Hence, the theoretical sodium hypochlorite consumption would be 2.0 gallons/hour at 150 CFM flow of the LFG (48 gallons/day). For the total flow of 7500 CFM, the theoretical consumption of 12.5% NaOCl would be around 2400 gallons/day. In actual field application, the theoretical consumption is often much less than what is actually observed. An average of several field studies published pertaining to NaOCl consumption for DMS removal was calculated at approximately 5 lbs NaOCl / lb sulfur. This average equates to an estimated consumption of 6.7 gallons/hour at 150 CFM flow of the LFG (162 gallons/day), about three times higher than the theoretical calculations. For the total flow of 7500 CFM, the estimated consumption of 12.5% NaOCl would be around 8,100 gallons/day.

The testing performed on-site resulted in NaOCl consumption rates about 8 times higher than estimated rates. The cause of high consumption is not definitively known, but qualitative GC results produced on-site and after the completion of testing show that a large variety of as yet unidentified (non-sulfur) compounds are being removed as well. It is thus suspected that NaOCl is reacting with a number of other unknown components in the LFG stream and reducing its capacity for sulfur removal. pH effects were considered, but no capacity should be lost to chlorine gas evolution at the pH's maintained during testing ($\underline{\geq}$ 6). Neutral pH (6-8) may reduce the rate of reaction but will not reduce the chemical's capacity.

6. Conclusions

A number of observations and conclusions were drawn from the on-site testing conducted. One of the most surprising observations was the high capacity of chemical needed in all of the tests conducted. The use of NaOCl resulted in effective (> 80%) treatment of sulfur species, but approximately 150 gallons was used to remove just 3.8 lbs of sulfur. This would equate to a usage of over 60,000 GPD chemical to treat the full LFG flow at equivalent efficiencies. This chemical usage is about 8 times higher than what is expected from reaction of NaOCl with the present sulfur components.

It is thus believed that there is an unknown reaction of component(s) in the LFG or its entrained condensate with the NaOCl that was rapidly consuming the chemical's activity for sulfur removal. It is recommended that further analysis be performed to potentially determine the component(s) responsible for the observed reaction consuming chemical capacity. Pending the results of analysis, it is also recommended that a system capable of removing undesirable components prior to sulfur treatment be designed and implemented, if undesirable component(s) are identified and can be feasibly removed.

It was also observed that a reaction of unknown nature between the component(s) in the LFG or its entrained condensate took place with H_2O_2 and caustic during scrubber testing, producing a significant amount of heat and evolved gas. The reaction did not take place immediately, but rather the reaction was delayed for about 30 minutes. The heat and pressure generated from this reaction warranted termination of the test involving H_2O_2 due to safety concerns. The capacity and efficiency of H_2O_2 for removal of sulfur species in the LFG stream was hence not determined. It is recommended that further analysis of the LFG stream and its entrained liquid components be conducted in order to potentially determine the component(s) responsible for this side reaction. If the cause of the side reaction can be identified and eliminated, further testing of H_2O_2 for sulfur removal is also recommended.

Testing with O_3 was conducted, although O_3 was only planned for use in conjunction with H_2O_2. The discontinuation of H_2O_2 testing opened a window for O_3 testing with water. O_3 was capable of removing as high as approximately 80% of sulfur species from the LFG stream with fresh water at a rate of 0.9 kg/h O_3. The efficacy of O_3 with water in continuous recirculation however is unknown. It is recommended that testing with water scrubbing followed by oxidation with O_3 over a longer treatment time be performed to quantify long term efficacy and water usage.

7. Appendix A – DMS Concentrations vs. Time for On-Site Tests Performed with NaOCl

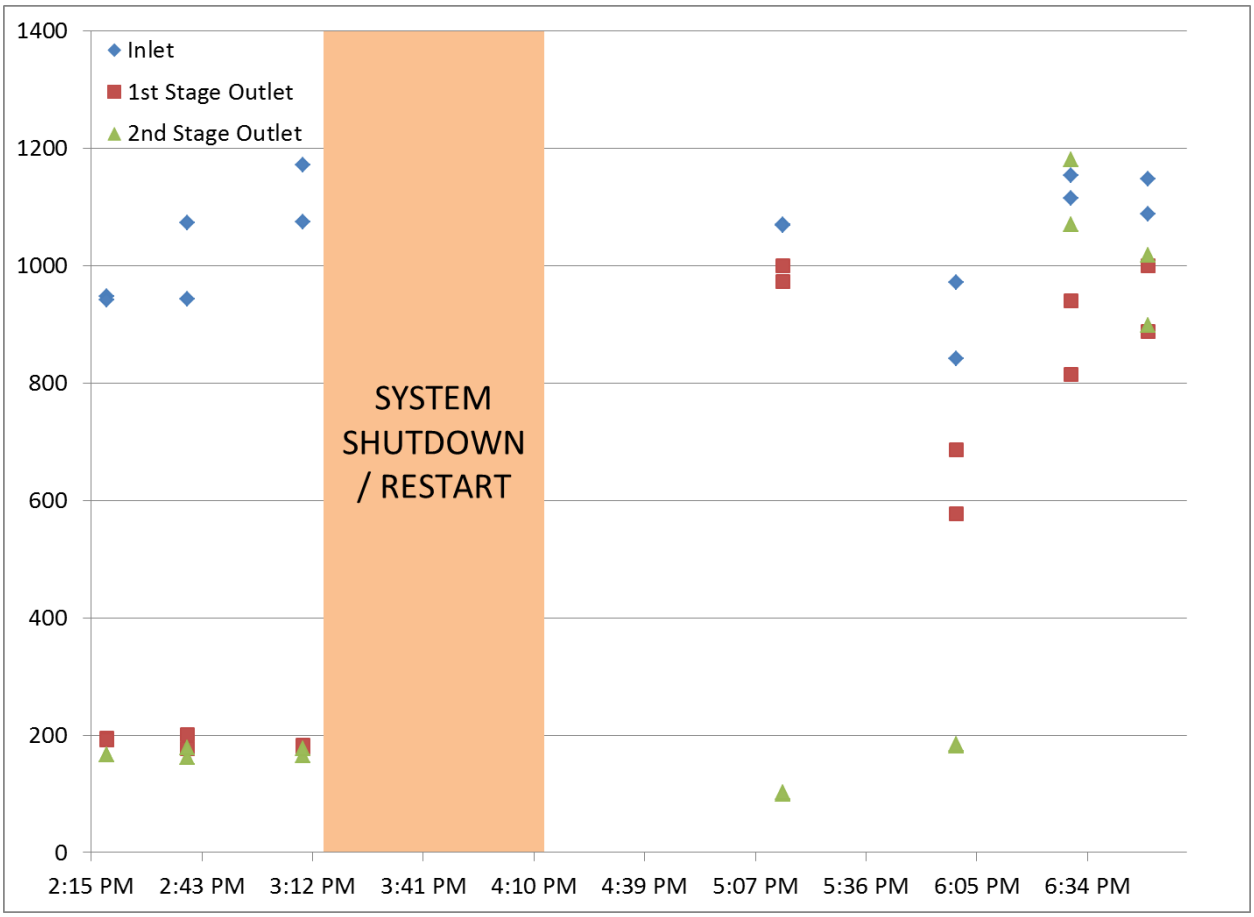


Figure 3. Day 2 – Testing with NaOCl additive (dual stage batch testing of 300 gallons of chemical)

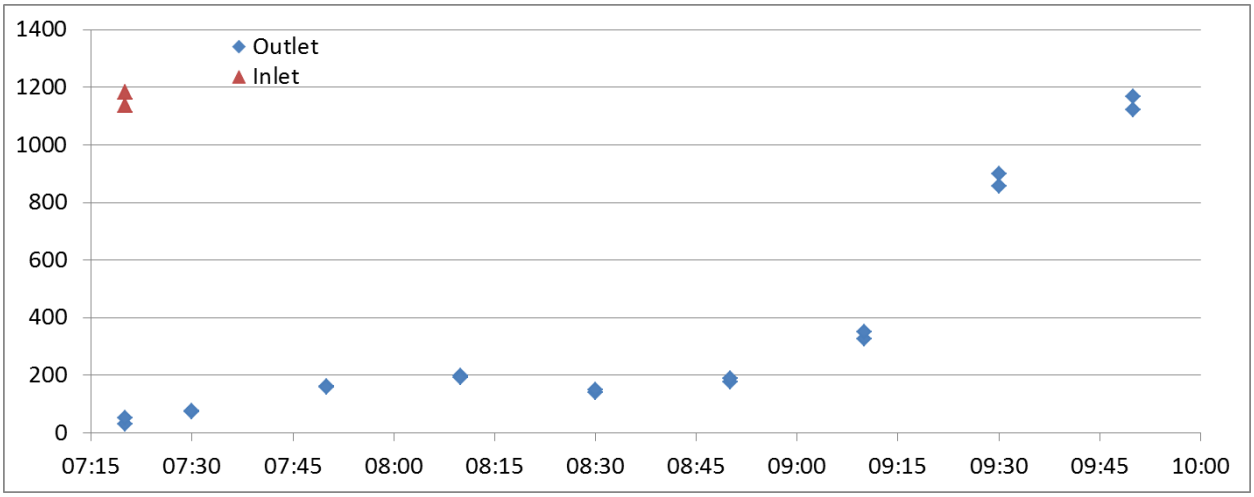


Figure 4. Day 4 - Testing with NaOCl (225+ gallons water - 1st stage, 150 gallons NaOCl - 2nd stage)

Test #1: Sulfur Removed and Chemical Usage Calculations

				Dimethyl sulfide (DMS)	Methyl mercaptan	Hydrogen sulfide (H2S)	Ethyl mercaptan	Diethyl sulfide	Dimethyl disulfide (DMDS)	Methylethyl sulfide	Isopropyl mercaptan
Gas Flow (SCFM)	150		TOTAL								
Gas Flow (MMSCFD)	0.216	Component Concentration (ppmv)	**1250**	1048	114	88	0	0.0	0	0	0.0
Average Gas Molecular Weight (g/mol)	30.42	Component Molecular Weight (g/mol)		62.13	48.11	34.08	62.13	90.19	94.20	76.16	76.16
(60 F, 1 atm) lb-mol/SCF	379.482	Component Flow (SCFD)	**270**	226.368	24.624	19.008	0	0	0	0	0
lb-mol/mol	453.592	Component Flow (mol/d)	**322.73**	270.58	29.43	22.72	0.00	0.00	0.00	0.00	0.00
mol/SCF	1.1953	Component Flow (g/d)	**19001**	16811	1416	774	0	0	0	0	0
Gas Flow (mol/d)	2.58E+05	Component Flow (kg/d)	**19.00**	16.81	1.42	0.77	0.00	0.00	0.00	0.00	0.00
Gas Flow (g/d)	7.85E+06	Component Flow (kg/yr)	**6935**	6136	517	283	0	0	0	0	0
Gas Flow (kg/d)	7854	Component Flow (lb/d)	**41.89**	37.06	3.12	1.71	0.00	0.00	0.00	0.00	0.00
Gas Flow (lb/d)	17315	Component Flow (lb/yr)	**15290**	13528	1139	623	0	0	0	0	0

RUN TIME (h):	3.25
REMOVAL EFFICIENCY (%):	80%
SULFUR REMOVED (lb):	**4.54**

NaOCl USED (gal):	300	
NaOCl CAPACITY (gal/lb S)	66.11	
TOTAL NaOCL REQUIRED AT 7500 SCFM (gal/d)	**110769**	**at 80% removal efficiency**

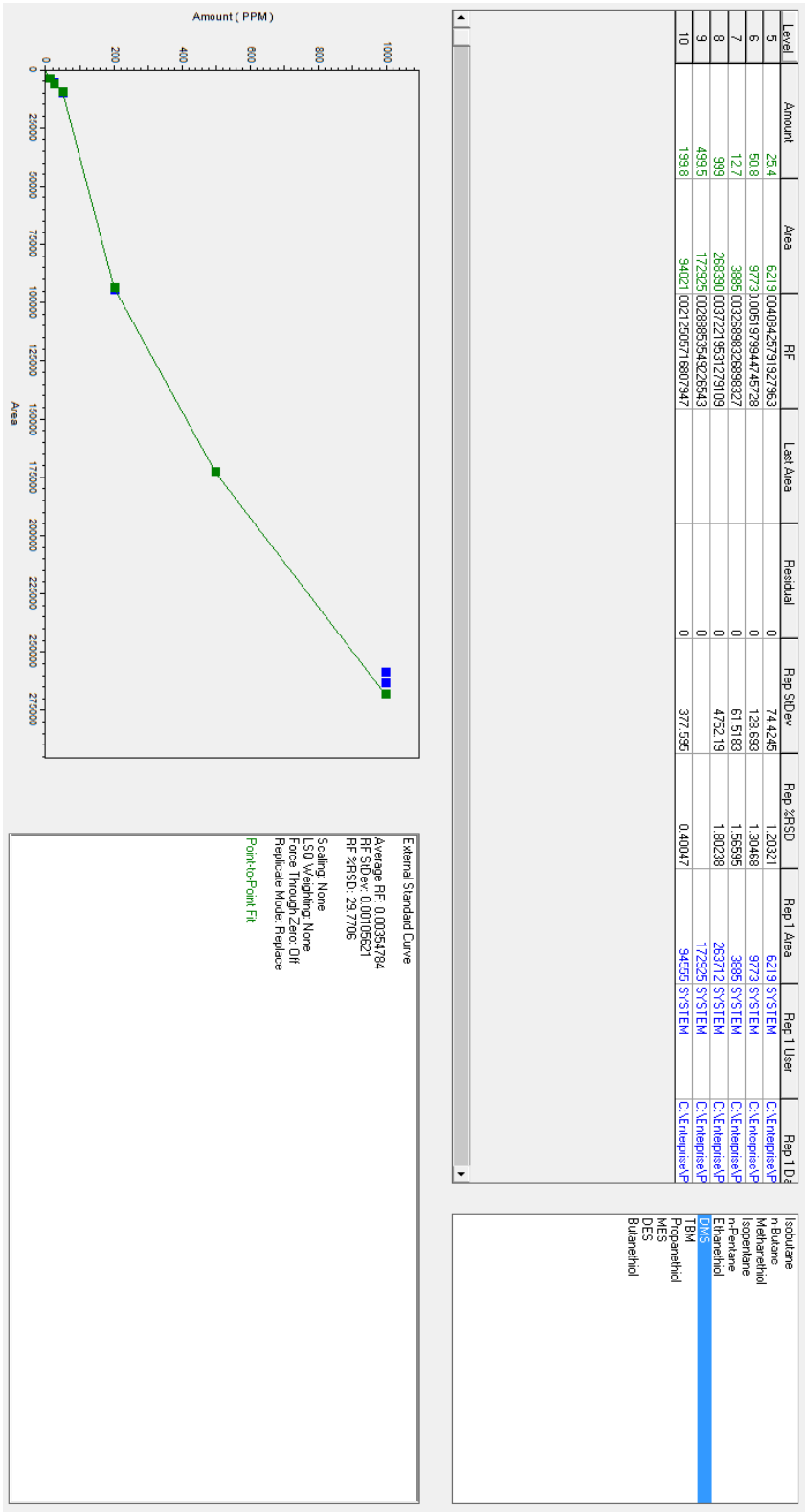
Test #4: Sulfur Removed and Chemical Usage Calculations

				Dimethyl sulfide (DMS)	Methyl mercaptan	Hydrogen sulfide (H2S)	Ethyl mercaptan	Diethyl sulfide	Dimethyl disulfide (DMDS)	Methylethyl sulfide	Isopropyl mercaptan
Gas Flow (SCFM)	150		**TOTAL**								
Gas Flow (MMSCFD)	0.216	Component Concentration (ppmv)	**1382**	1159	155	65	3.4	0.0	0	0	0.0
Average Gas Molecular Weight (g/mol)	30.42	Component Molecular Weight (g/mol)		62.13	48.11	34.08	62.13	90.19	94.20	76.16	76.16
(60 F, 1 atm) lb-mol/SCF	379.482	Component Flow (SCFD)	**299**	250.344	33.48	14.04	0.7344	0	0	0	0
lb-mol/mol	453.592	Component Flow (mol/d)	**356.91**	299.23	40.02	16.78	0.88	0.00	0.00	0.00	0.00
mol/SCF	1.1953	Component Flow (g/d)	**21143**	18591	1925	572	55	0	0	0	0
Gas Flow (mol/d)	2.58E+05	Component Flow (kg/d)	**21.14**	18.59	1.93	0.57	0.05	0.00	0.00	0.00	0.00
Gas Flow (g/d)	7.85E+06	Component Flow (kg/yr)	**7717**	6786	703	209	20	0	0	0	0
Gas Flow (kg/d)	7854	Component Flow (lb/d)	**46.61**	40.99	4.24	1.26	0.12	0.00	0.00	0.00	0.00
Gas Flow (lb/d)	17315	Component Flow (lb/yr)	**17014**	14960	1549	460	44	0	0	0	0

RUN TIME (h):	2.75
REMOVAL EFFICIENCY (%):	85%
SULFUR REMOVED (lb):	**4.54**
NaOCl USED (gal):	150
NaOCl CAPACITY (gal/lb S)	33.04
TOTAL NaOCL REQUIRED AT 7500 SCFM (gal/d)	**65455** **at 85% removal efficiency**

Appendix B – Chemical Consumption Calculations

Appendix C – DMS Calibration Curve used at the Agilent Micro GC 490



Level	Amount	Area	RF	Last Area	Residual	Rep StDev	Rep %RSD	Rep 1 Area	Rep 1 User	Rep 1 Da
5	25.4	6219	0.00408425791927963		0	74.4245	1.20321	6219 SYSTEM	C:\Enterprise\P	
6	50.8	9773	0.00519799447457281		0	128.693	1.30468	9773 SYSTEM	C:\Enterprise\P	
7	12.7	3885	0.00326898326898327		0	61.5183	1.56595	3885 SYSTEM	C:\Enterprise\P	
8	999	263390	0.00379221953127910		0	4752.19	1.80238	263712 SYSTEM	C:\Enterprise\P	
9	499.5	172925	0.00288883549226543		0			172925 SYSTEM	C:\Enterprise\P	
10	199.8	94021	0.00212505716807947		0	377.595	0.40047	94555 SYSTEM	C:\Enterprise\P	

Appendix D

Technip Protocol

Technip
Technip Stone & Webster Process Technology

Bridgeton Landfill Pilot Test
Test Plans & Test Results

1. Test Plan

1.1. Purpose

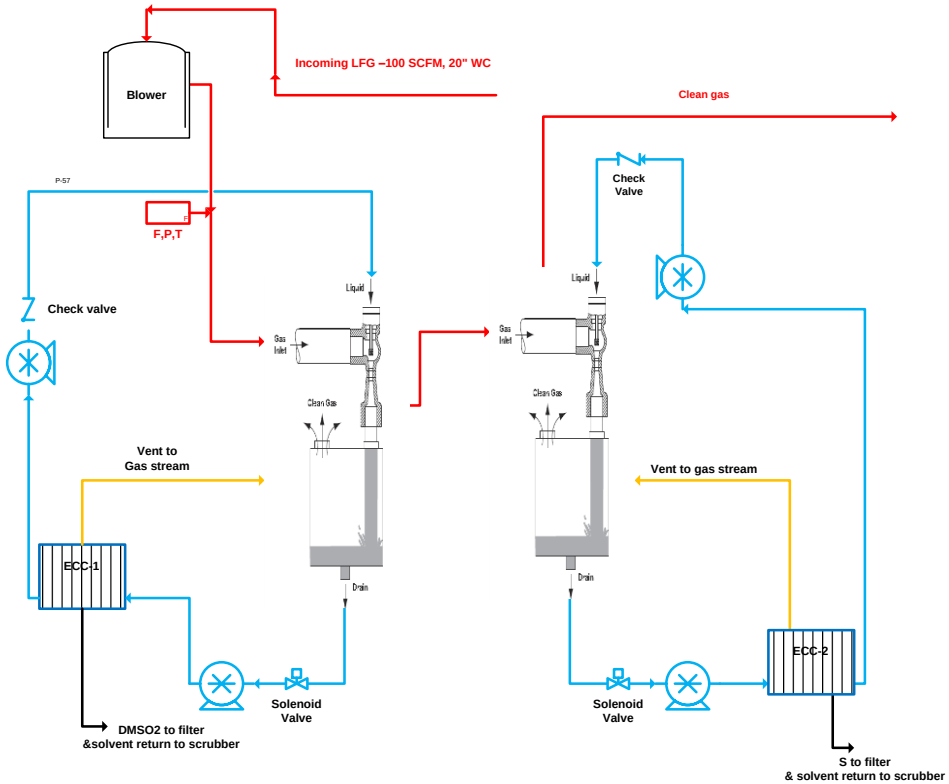
This test is intended to verify the performance of the Technip gas separation technology when applied to the landfill gas stream at the Bridgeton landfill. Examples of the detailed composition results of sulfur analysis are attached at the end of the document for reference.

1.2. Components Being Tested

Technip will deliver a skid mounted pilot test system designed to capture and isolate sulfur compounds in the 7500 SCFM landfill gas stream at Bridgeton. Major system components include:

- Blower
- Venturi Scrubbers
- Electrolyzer
- Conditioning pumps
- Process pumps
- Filters
- Solution (delivered in a container with skid)

For this pilot test a slip stream of 100 SCFM will be used. The block flow diagram below describes the major components of the pilot system. (A larger version of this diagram is included in the Appendix).



2. Test Strategy

2.1. Test Procedure

	Action	Responsibility
Day 1	Installation of skid: • Gas piping connections • Power • System startup – verify flow	Bridgeton to install skid on platform and make gas and power connections
Day 2 - 4	Begin testing following the flow rate adjustments listed below	Technip Nexo to monitor S content
	Action	**Responsibility**
Day 3	Run system for 24 hours	Technip
Day 4	Review data and make any adjustments to the system or solution for optimization	Technip / SCS / Bridgeton
Day 5	Test completion	All
Day 6 - 10	If deemed necessary or of any value – System to run continuously for additional performance evaluation	Bridgeton / SCS
Final Day	Disconnect gas and power Prepare for shipment back to California	Bridgeton

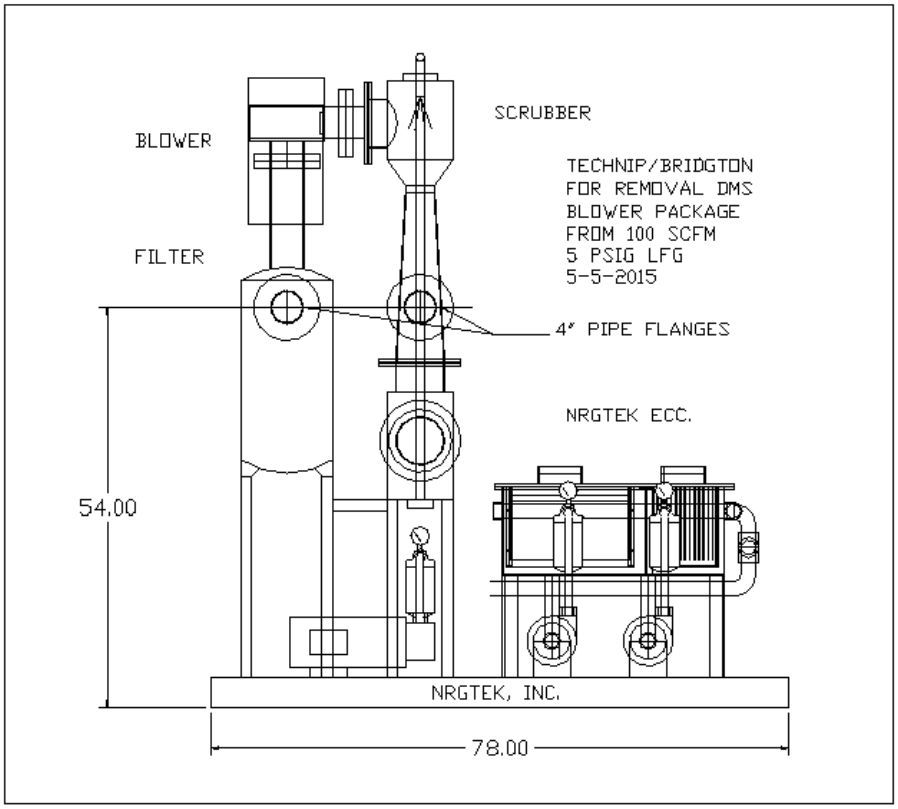
Date	Time	Temp	Rel Hum	Flow Rate	Inlet S	Outlet S	Requirement	LFG Pressure Drop (Flange to Flange)	Solvent Pressure Drop (Across Filter)	Sulfur by-Product Water Content	Solvent Usage	Power consumed
		°C	%	SCFM	ppm	ppm	ppm	mbar	mbar	Gal	Gal	kW
				20								
				40								
				60								
				80								
				100								
				20								
				40								
				60								
				80								
				100								
				20								
				40								
				60								
				80								
				100								
				20								
				40								
				60								
				80								
				100								

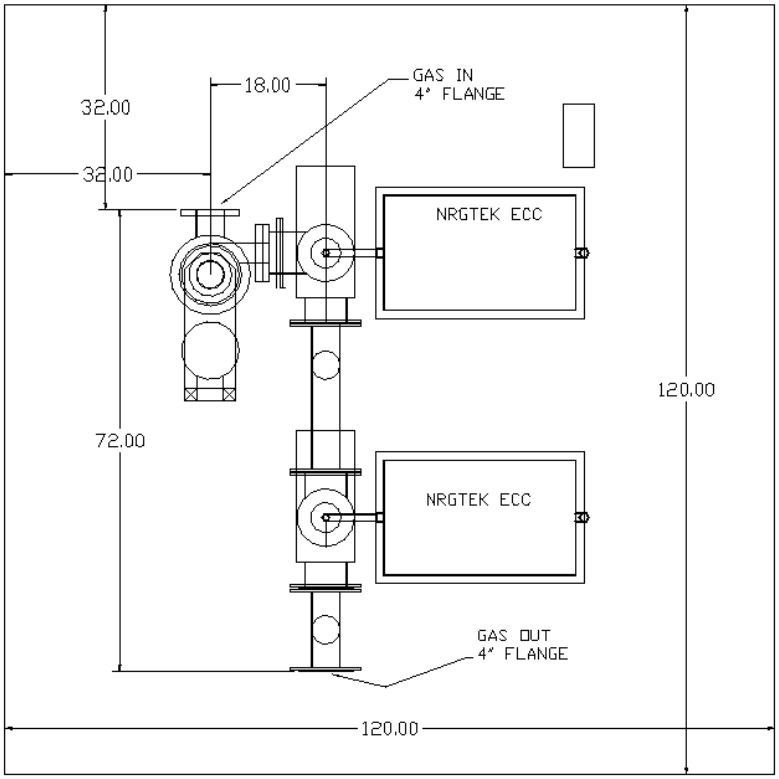
The LFG slip stream, supplied by Bridgeton at 0-20 inches of water skid inlet pressure, will be adjusted from 20 SCFM to 100 SCFM in steps of 20 SCFM each, over a period of 1 hour at each flow rate, to observe system stability, and to make any system operational changes as required. At each flow rate measurement, a reading of inlet Sulfur will be taken and recorded, all well as the outlet Sulfur under the same conditions. Temperature, pressure and sulfur levels will also be recorded for each stage. The LFG flow rate will be measured by manual flow-meters.

2.2. Site Preparation and System Installation
The site will be an existing 10 x 10 concrete pad at the Bridgeton landfill adjacent to the gas pipeline (reference pictures below)

2.2.1.1. Electrical and instrumentation: 2 ea. 1/3HP 110VAC, 1PH pumps, 1 ea. 2HP, 220/440VAC, 3PH pump, an AC-DC power supply, rated at 1500 W to run the ECC, and a control panel for level switches, pumps on/off and ECC on/off will be included in the skid.

2.2.1.2. Skid layout and dimensions





2.2.1.3. System start-up and leak testing: After installation of the system, and after completion of electrical and gas connections, the system will be checked for any gas leaks and solvent leaks, as well as pump operation and ECC operation,

2.3. Test Equipment
A GC-MS will be provided by Nexo, a subcontractor to Bridgeton Landfill for on-site measurements of the Technip system inlet and outlet treated landfill gas, to measure all species of sulfur - containing gases.

2.4. Definition of a Successful Test, Pass / Fail Criteria:
Pilot system testing will be used to verify the maximum sulfur removal rate of the landfill gas with inlet levels up to 1500 ppm of total sulfur. Sulfur removal efficiency will be measured, using onsite GC-MS instrumentation, provided by Nexo Services.

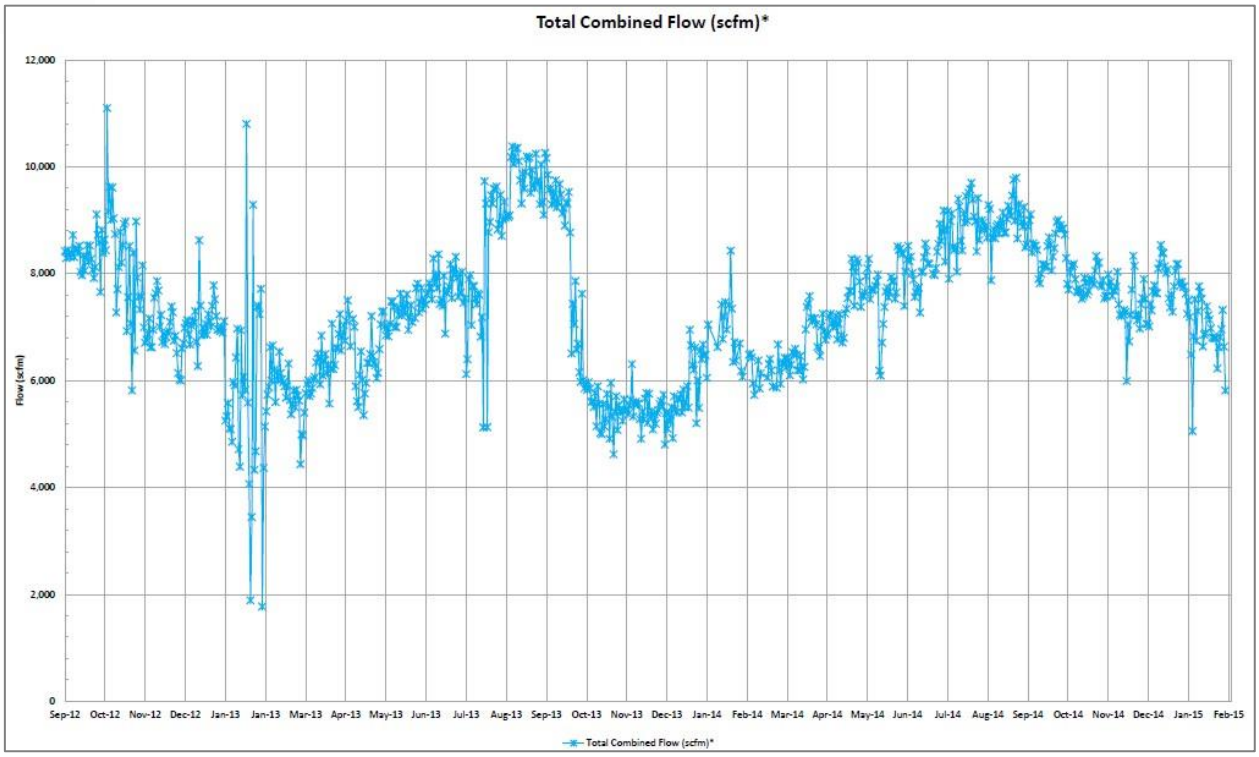
2.5. Contingencies/ Mitigation for Preliminary or Insufficient Results:
In case the total S clean-up results are deemed insufficient, and it is deemed by all parties to be critical to the project to continue testing, Technip will, at their own costs, try different solvents or other mitigation technologies to achieve the pass/fail criteria of 90% removal of total sulfur. Onsite support from Bridgeton personnel and Nexo GC services will be requested as required.

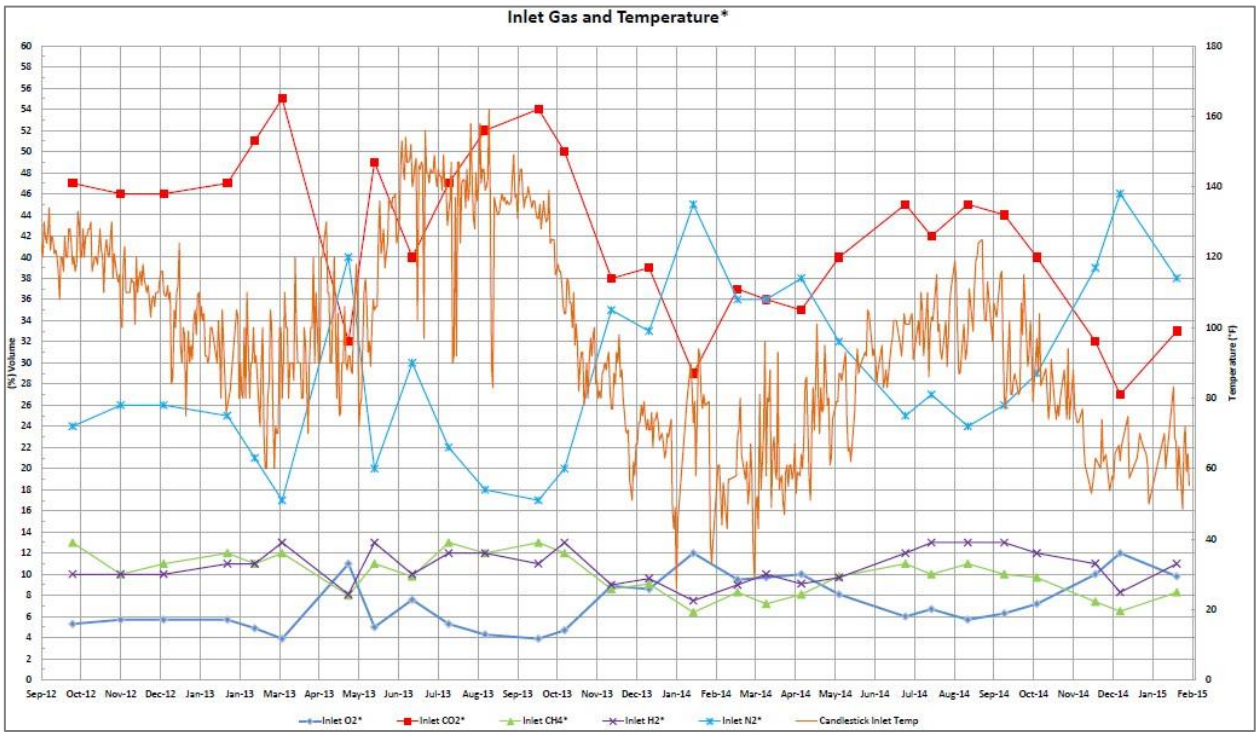
2.6. Analysis of Data – Design Summary:
Technip will provide a preliminary report summarizing the performance of the system within 5 days of completion of tests of the 100 SCFM system, and a final report within 14 days of completion of the testing.

Appendix

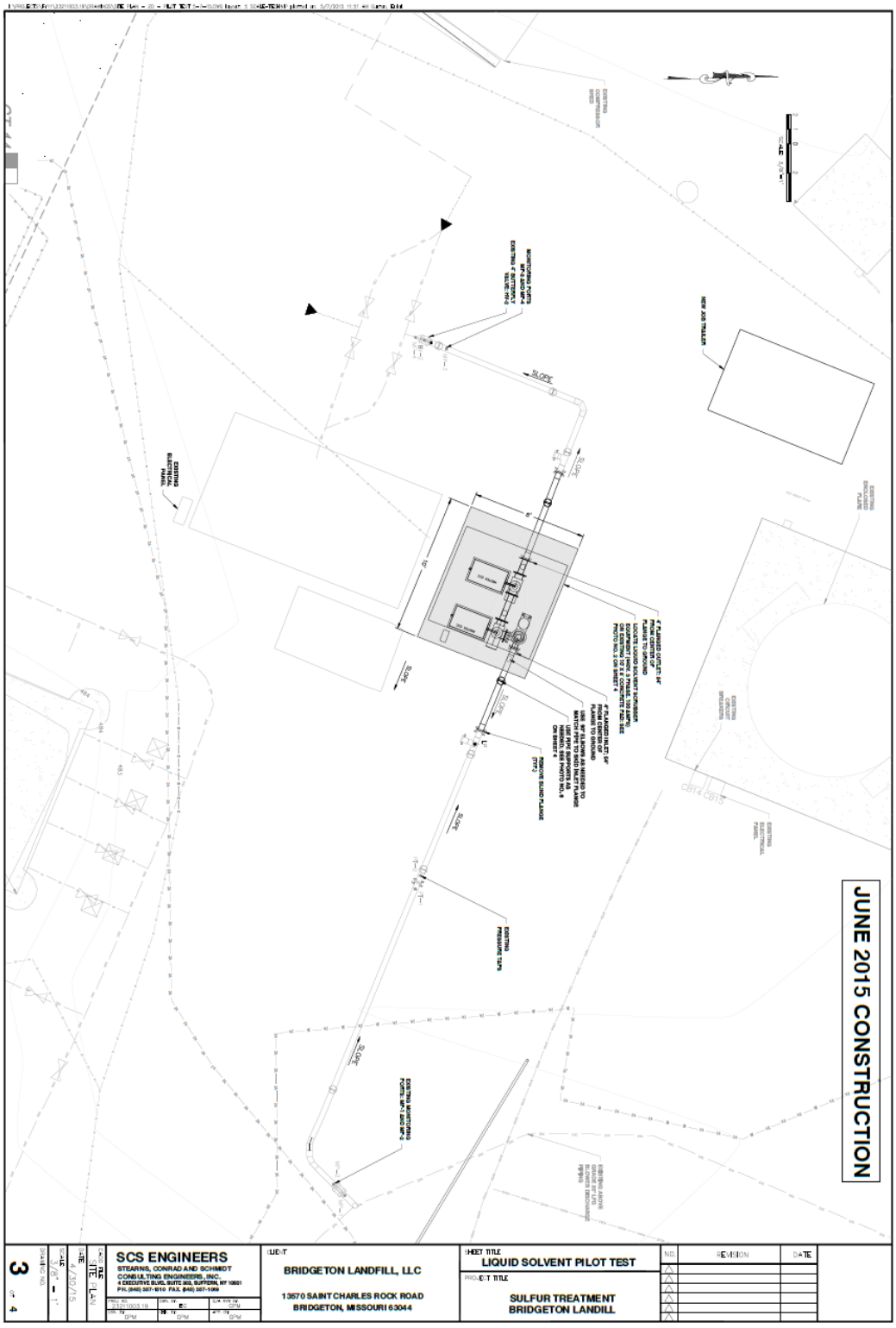
Data Set A

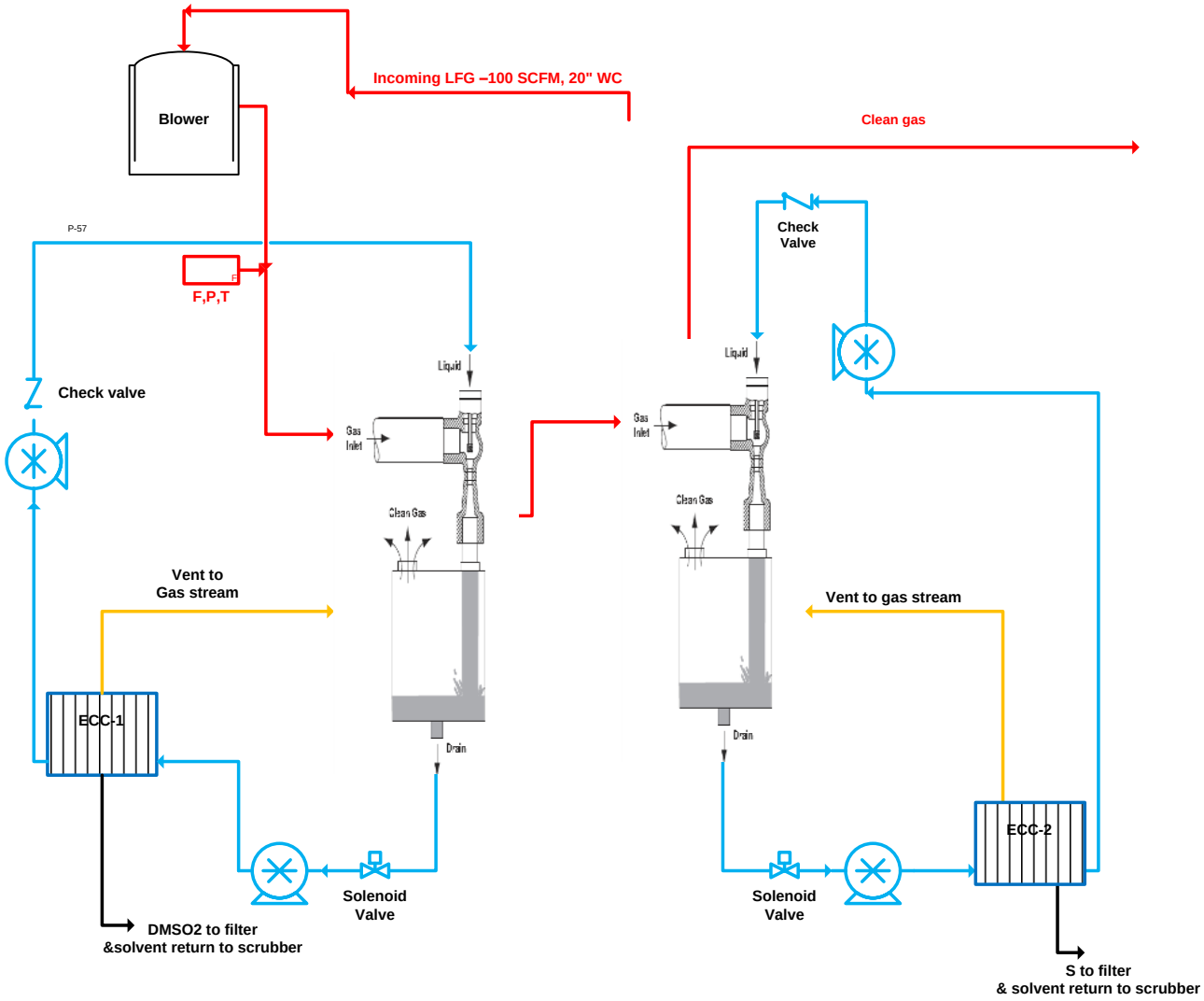
ASTM Method D 5504			July 2014			January 2015*		
Compound	MW	# of sulfurs	µg/m3	ppm	ppm as H2S	µg/m3	ppm	ppm as H2S
2,5-Dimethylthiophene	112.19	1	4,100	0.9	0.9	455	0.1	0.1
2-Ethylthiophene	112.19	1	2,600	0.6	0.6	455	0.1	0.1
3-Methylthiophene	98.17	1	4,600	1.1	1.1	400	0.1	0.1
Carbon Disulfide	76.14	2	1,600	0.5	1.0	480	0.2	0.3
Carbonyl Sulfide	60.08	1	1,100	0.4	0.4	750	0.3	0.3
Diethyl Disulfide	122.25	2	285	0.1	0.1	250	0.1	0.1
Diethyl Sulfide	90.19	1	420	0.1	0.1	365	0.1	0.1
Dimethyl Disulfide	94.2	2	210,000	54.5	109.1	79,000	20.5	41.0
Dimethyl Sulfide	62.13	1	2,400,000	945.1	945.1	990,000	389.8	389.8
Ethyl Mercaptan	62.13	1	2,200	0.9	0.9	1,900	0.7	0.7
Ethyl Methyl Sulfide	76.16	1	18,000	5.8	5.8	7,300	2.3	2.3
Hydrogen Sulfide	34.08	1	320	0.2	0.2	34,000	24.4	24.4
Isobutyl Mercaptan	90.19	1	420	0.1	0.1	365	0.1	0.1
Isopropyl Mercaptan	76.16	1	355	0.1	0.1	310	0.1	0.1
Methyl Mercaptan	48.11	1	210,000	106.8	106.8	260,000	132.2	132.2
n-Butyl Mercaptan	90.19	1	5,200	1.4	1.4	3,100	0.8	0.8
n-Propyl Mercaptan	76.16	1	355	0.1	0.1	310	0.1	0.1
tert-Butyl Mercaptan	90.19	1	420	0.1	0.1	365	0.1	0.1
Tetrahydrothiophene	88.17	1	8,600	2.4	2.4	3,300	0.9	0.9
Thiophene	84.14	1	30,000	8.7	8.7	18,000	5.2	5.2
Total Reduced Sulfur Concentration (Detections only)	34.08	1	2,898,320			1,396,600		
Total Reduced Sulfur Concentration (Detections + MDL or MRL if compound was detected in the other sampling event)	34.08	1	2,898,320		1,185.1	1,401,680		599.1


Total Combined Flow (scfm)*
Flow (scfm)
12,000
10,000
8,000
6,000
4,000
2,000
0
Sep-12 Oct-12 Nov-12 Dec-12 Jan-13 Jan-13 Mar-13 Apr-13 May-13 Jun-13 Jul-13 Aug-13 Sep-13 Oct-13 Nov-13 Dec-13 Jan-14 Feb-14 Mar-14 Apr-14 May-14 Jun-14 Jul-14 Aug-14 Sep-14 Oct-14 Nov-14 Dec-14 Jan-15 Feb-15
Total Combined Flow (scfm)*


Inlet Gas and Temperature*
(%) Volume
Temperature (°F)
Sep-12 Oct-12 Nov-12 Dec-12 Jan-13 Jan-13 Mar-13 Apr-13 May-13 Jun-13 Jul-13 Aug-13 Sep-13 Oct-13 Nov-13 Dec-13 Jan-14 Feb-14 Mar-14 Apr-14 May-14 Jun-14 Jul-14 Aug-14 Sep-14 Oct-14 Nov-14 Dec-14 Jan-15 Feb-15
Inlet O2*
Inlet CO2*
Inlet CH4*
Inlet H2*
Inlet N2*
Candlestick Inlet Temp

Site Plan


JUNE 2015 CONSTRUCTION
SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
4 EXECUTIVE BLVD, SUITE 303, SUFFERN, NY 10901
P.H. (845) 357-1510 FAX (845) 357-1560
CLIENT
BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044
SHEET TITLE
LIQUID SOLVENT PILOT TEST
PROJECT TITLE
SULFUR TREATMENT
BRIDGETON LANDILL
NO.
REVISION
DATE
SITE PLAN
SLOPE
NEW JOB TRAILER
EXISTING ELECTRICAL PANEL
EXISTING PRESSURE TAPS
EXISTING MONITORING POINTS MW-27 AND MW-28


Blower
Incoming LFG –100 SCFM, 20" WC
Clean gas
P-57
F,P,T
Check Valve
Check valve
Liquid
Gas Inlet
Clean Gas
Drain
Vent to Gas stream
Vent to gas stream
ECC-1
ECC-2
Solenoid Valve
Solenoid Valve
DMSO2 to filter &solvent return to scrubber
S to filter & solvent return to scrubber

Appendix E

Technip Report

St. Louis, Missouri Landfill -

Final Report: Testing of 100 SCFM Pilot for Total Sulfur Removal

The subject landfill site at St. Louis, Missouri, has a gas evolution rate of around 5,000 scfm, and mainly consists of 12% methane, 12% hydrogen, 30% nitrogen and the rest as carbon dioxide. However, the landfill gas has a high composition of sulfur compounds, almost 1500 ppmv of total reduced sulfur, mainly consisting of dimethyl sulfide and methyl mercaptans. A sulfur remediation process is desirable to reduce the sulfur composition of the landfill gas to less than 100 ppmv.

Specifications from SCS Engineers:

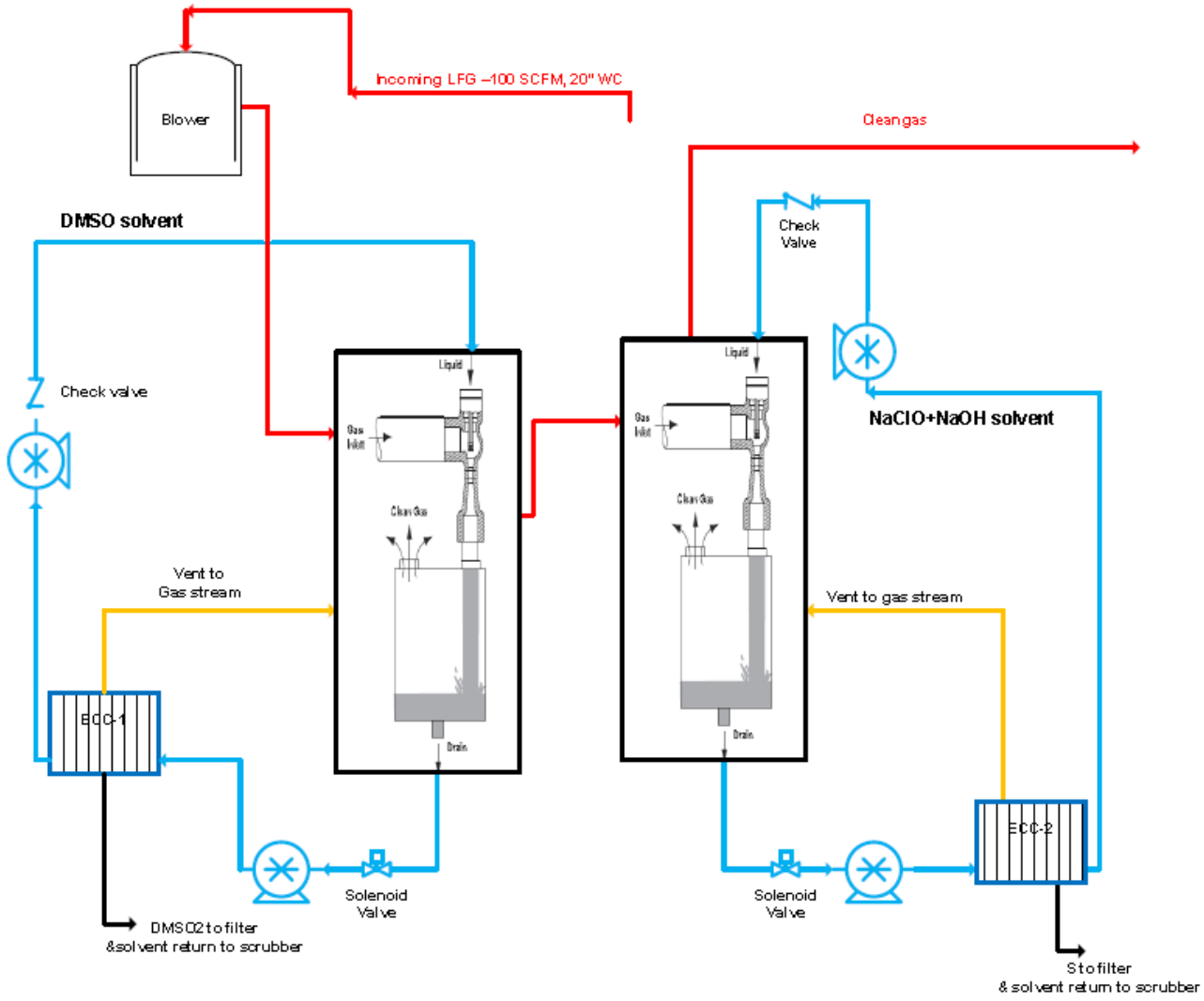
Data:

Landfill Location:	**St. Louis, Missouri**
LFG Temperature:	**100 ^{o}F**
LFG Moisture:	**Saturated**
Total Reduced S Concentration	**1335 Avg ppmv**

Landfill at St. Louis, Missouri

Date Analysed	9/11/2014	8/27/2014	8/14/2014	8/5/2014	5/7/2014	4/7/2014	Average
	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv
Dimethyl sulfide	902	979	1079	736	1095	1048	**973**
Ethyl mercaptan	1	0.4	2	2	187	2.5	**32**
Diethyl sulfide	0.07	0.4	0.04	0.44	139	1	**23**
Methylethyl sulfide	0.07	0.4	0.04	5	15.6	7.3	**5**
Dimethyl disulfide	15	128	87	41	20.3	108	**67**
Hydrogen sulfide	30	4	19	33	11.5	39.5	**23**
Methyl mercaptan	1	0.4	0.7	0.4	8.3	1.2	**2**
Isopropyl mercaptan	221	101	250	199	0.7	263	**172**
Total reduced S as H_2S	**1184**	**1285**	**1472**	**1033**	**1509**	**1524**	**1335**

Test System: Nrgtek Inc. fabricated and installed a pilot test system for treatment of 100 SCFM Landfill Gas Flow-rate. The detailed process flow diagram of the fabricated pilot test plant is as shown below.



Process Flow Diagram for 100 SCFM LFG H_2S/Organic S Removal System

Process Description: The Company's patented process consists of a two-stage liquid scrubber solvent media, especially selected for preferential absorption / dissolution of dimethyl sulfide and other organic sulfur species, in preference to methane, hydrogen, carbon dioxide and other common contaminants in Landfill Gas. The solvent media, now saturated with sulfur species, is then passed through two special vessels, the electrochemical catalytic converter (ECC), wherein the dimethyl sulfide is oxidized to sulfoxide in one system, and the hydrogen sulfide and mercaptan species are electro-chemically converted to elemental sulfur in the other system. The products are non-volatile and do not have any specific noxious sulfide smells, and can be safely sequestered. The solvent is continuously recycled to the scrubber system for further removal of sulfur species from the landfill gas, in a closed loop.

It was proposed that the technology be demonstrated in two phases: the first phase as a proof-of-concept phase, with a two-stage 100 SCFM scrubber system, with its own electro-catalytic converters (ECCs). The 100 SCFM pilot plant was delivered to the Bridgeton Landfill site on June 20th, 2015, and the gas connections and electrical connections completed on June 22nd, 2015, whereupon the system was ready for testing. The detailed testing was witnessed by personnel from SCS Engineers (Mr. Erdal Gurten) and Technip, Stone and Webster Inc. (Mr. Jean-Francois Fournier and Mr. Louis Romo).

The second phase (by Technip Stone and Webster Inc.), if the first phase was successfully demonstrated, would have been the engineering, design, fabrication and deployment of a full-scale system.

Equipment List: The detailed items in the 100 SCFM Phase I system, other than appurtenances and piping, filters, pressure gages and sight glasses, comprised the following specialty equipment:

1. (3) ea transformers, single phase, 60 HZ, 240 x 480 primary v, 120/240 secondary v, 4 W.
2. (3) ea Lambda ESS40-250 Power DC supply units.
3. (1) ea TSI Alnor VelociCalc 9535 Air velocity meter, articulated (to estimate flow velocity and flow-rates through the 4" dia pipe.
4. (1) ea Sonic Air Blower system, Sonic 70/7.5HP 4" dia flange, capable of 700 SCFM at full speed.
5. (1) ea Frequency Control Unit, Lenze120 /240 VAC unit for blower speed control.
6. (2) ea Schutte & Koerting 7014 ejector-venturi scrubber systems, capable of 100 SCFM each at 40" W.C., 3/4" nozzle, 12 gpm liquid flow rate.
7. (2) ea ECC systems, with 2 series of electrochemical cells ea, capable of 40 V/250 A DC ea; fabricated in-house with Teflon electrode seats and 12 ea cells per stage, for 4 stages, stainless steel electrodes, 8" by 16" ea.
8. A chiller-condensate system to remove any condensate components in the LFG flow. The chiller system was operated at 17oC during the course of the test, but the temperature of the LFG was not measured, due to a malfunctioning thermocouple in the flow measurement instrument.
9. An electrical control panel box.
10. (2) ea 12-GPM pump-motor assemblies and 4 ea 3-GPM pump-motor assemblies.

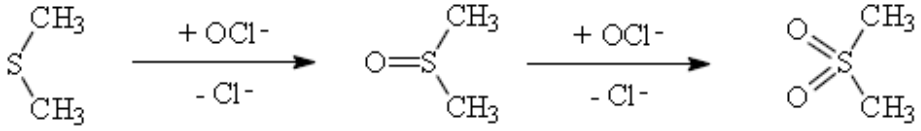
Pilot Plant Testing Details: It was decided, after joint consultations between Technip technical staff and Nrgtek personnel, to use dimethyl sulfoxide (DMSO) as the solvent in the first stage scrubber, and a NaCl solution (electrolyzed to NaClO in the second-stage ECC) as the solvent in the second stage scrubber.

Dimethyl sulfoxide (DMSO) is an aprotic, polar solvent that is widely used in chemistry and biology. It dissolves hydrophobic and hydrophilic solutes, is used as a cryoprotectant for biological samples, and is a component in drug delivery. Researchers have taken advantage of the miscibility of DMSO with water, organic solvents, and ionic liquids (IL) to solubilize polymers and enhance reaction chemistry. DMS is mutually miscible in high contents with DMSO.

Literature searches (***Ref 1 below***) have revealed the possibility of oxidizing dimethyl sulfide (DMS), dissolved in DMSO solvent to produce DMSO from the oxidization of DMS (the main contaminant in the Bridgeton LFG) in suitable electrochemical cells. Oxidation of DMS to DMSO is reported to occur in the potential range of 0.8–1.1 V, while oxidation of DMSO to $DMSO_2$ occurs at more positive potentials (ca. 1.6–1.7 V).

In addition, another article (***Ref 2, below***) quoted the ease with which DMS was electro-chemically oxidized to DMSO in both neutral solutions and by sodium hypochlorite solutions (in a basic media). Depending on the electrode potential and the material of the anode, two different mechanisms were proposed. The indirect anodic oxidation of dimethyl-sulphide (DMS) with *in situ*-generated hypochlorite ions results in dimethyl sulphoxide (DMSO) and dimethyl-sulphone (DMSN, also called $DMSO_2$) consecutively (Scheme 1).

Indirect anodic oxidation of DMS with *in situ*-generated hypochlorite:

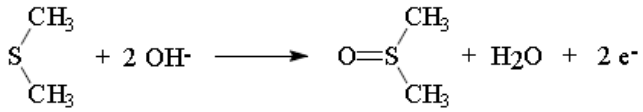


DMS DMSO DMSN

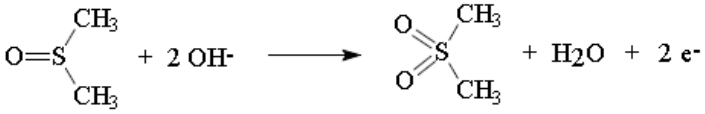
Reference 2 also suggested that a direct oxidation of DMS to DMSO was also possible, without the use of hypochlorite solutions, very possibly by the generation of hydroxyl anions by *in situ* electrolysis of water, as suggested by Scheme 2, shown below, leading sequentially to DMSO and thence to $DMSO_2$.

Scheme 2
Direct anodic oxidation of DMS:

Step 1



Step 2



References:

1. Identification of dimethyl sulfide in dimethyl sulfoxide and implications for metal-thiolate disulfide exchange reactions, *RSC Adv., 2015, 5, 40603*, by Gamage S. P. Garusinghe, S. Max Bessey, Chelsea Boyd, Mostapha Aghamoosa, Brian G. Frederick, Mitchell R. M. Bruce and Alice E. Bruce.

2. STUDY ON THE ELECTROLYTIC DEGRADATION OF SULPHIDE-CONTAINING CHEMICAL RESIDUES FROM WASTEWATER IN SALINE SOLUTION, *Materials Science and Engineering, Volume 39, No. 1 (2014), pp. 51–57, by* FERENC MOGYORÓDY, University of Miskolc, Institute of Chemistry, 3515 Miskolc-Egyetemváros, Hungary.

Accordingly, after detailed discussions between Technip and Nrgtek, it was decided to incorporate both these mechanisms in a dual-stage scrubber, wherein the first stage would use DMSO as the solvent for DMS and other volatile sulfides, electrochemically oxidize the dissolved DMS to DMSO, and the second stage would use *in situ* generated sodium hypochlorite from a salt solution to oxidize DMS to DMSO and $DMSO_2$.

Unfortunately, the first series of tests performed at the Bridgeton Landfill revealed contrary results to the results claimed in the first reference document. It was found that the use of DMSO as a solvent in an electrochemical cell has significant issues, ranging from an inadequate electrochemical conductivity to a lack of stability in electrolysis.

Test 1: Initially, a 80% DMSO solution was used in stage 1, the balance made up of 20% water with a saturated solution of sodium perchlorate, for a total solvent volume of 30 gallons. $NaClO_4$ is a well-known electrolyte, with the perchlorate ion virtually impossible to break down even at a voltage window of -3.0 to +3.5 v. However, even with this electrolyte make-up, no ionic conductivity was observed through the stage 1 ECC, with negligible amperage through the system, even though the power supply unit was rated at 40V/250A output through the ECC unit. Accordingly, the system was run with no power supply to ECC-1, and with salt water as a solvent in ECC-2, assuming that the salt water would be electrolyzed to NaClO. The voltage per cell was maintained at 1.45 v ea, across 12 cells in each bank, sufficient to produce hypochlorite *in situ*.

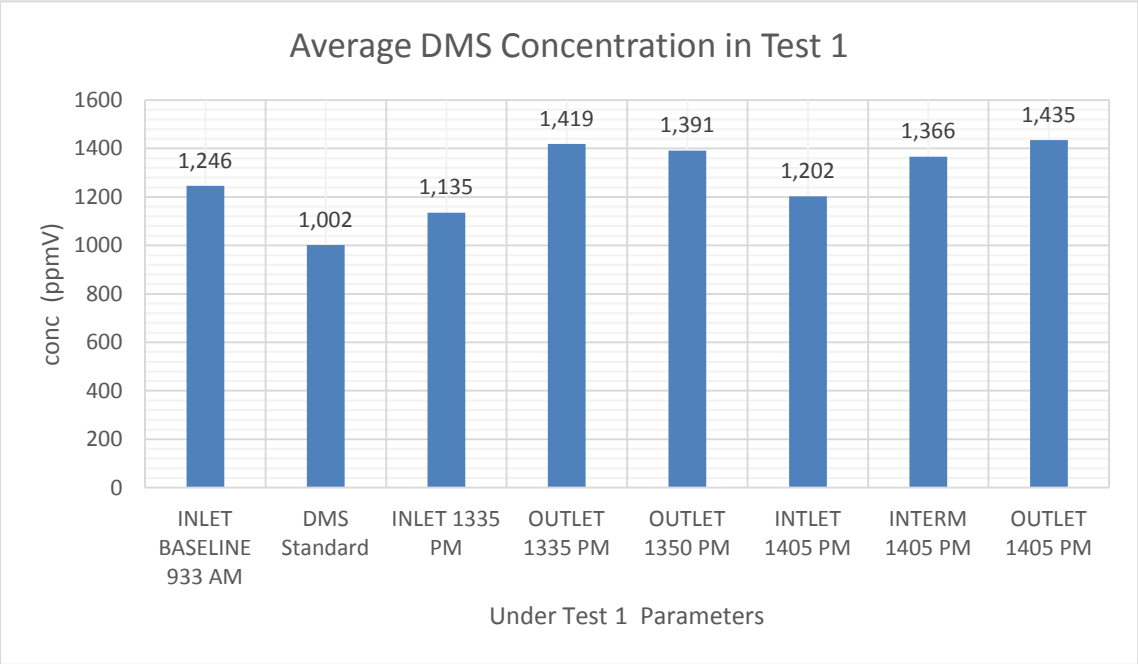
Table 1: Test 1 Parameters

ECC-1							**Chiller**	**Blower**	**LFG Flow**	**LFG Temperature**
	Date	Start Time	End Time	Solution	Voltage	Amps		%	scfm	F
Test 1	6/23/15	1330	1405	DMSO/Perchorate/Salt Water	N/A	N/A	ON	OFF	20	106
ECC-2										
		Solution	Voltage	Amps 1	Voltage 2	Amps 2	pH Initial	pH Final		
Test 1	6/23/15	Salt Water	17.5	28	17.5	47	-	-		

Test protocol:

i. A morning sample was obtained at 0933 Hr and a daily 1000 ppmV standard check was analyzed with the sample.
ii. Samples were taken at 5 minute and 35 minute run time. The INTERIM sample was taken from a sample port between Stage 1 and Stage 2.
iii. ECC-1 run on Spray Mode, no electrolysis was performed.
iv. ECC-2 was run on Spray + Electrolytic Mode.
v. Gas analysis was done using a GC/MS instrument, provided by Nexo Solutions.

Figure 1: GC TCD Analysis Results of Test 1



Discussions: As can be seen from the graphics above, no DMS removal was observed throughout the test period, with incoming DMS levels almost equal to outgoing DMS levels. It is conjectured that no DMS dissolution took place in the salt water in stage 2, and any DMS which did dissolve in stage 1 immediately desorbed, since no conversion was taking place as ECC-1 was switched off. In addition, a large amount of condensate, including water, even in limited runs, was also observed, reducing the capacity of the solvent to absorb significant amounts of DMS, since DMSO solvent is very miscible in water, in preference to organic compounds.

Test 2 & 3: Accordingly, the electrolyte make-up was changed to 40% DMSO, with the balance made up with aqueous salt solutions (NaClO + NaCl), in successive stages, till the ECC could show amperages of 40-100 amps coursing through it. Tests were performed at this stage, at 20 SCFM of LFG gas flow through the system, to assess DMS removal efficiency, for 30 minutes. The test results are shown below.

Test 2 and 3 Results:

Test protocol:

i. **Test 2**: Liquid samples of the scrubbing solution from ECC-1 were analyzed for DMS in their gaseous head-space.

DMSO EX: sample extract of DMSO from ECC-1, diluted with water 1:5 by volume.

DMSO EX CONC 1: sample extract of DMSO from ECC-1 undiluted.
DMSO EX CONC 2: sample extract of DMSO from ECC-1 undiluted after running the system for 30 minutes.

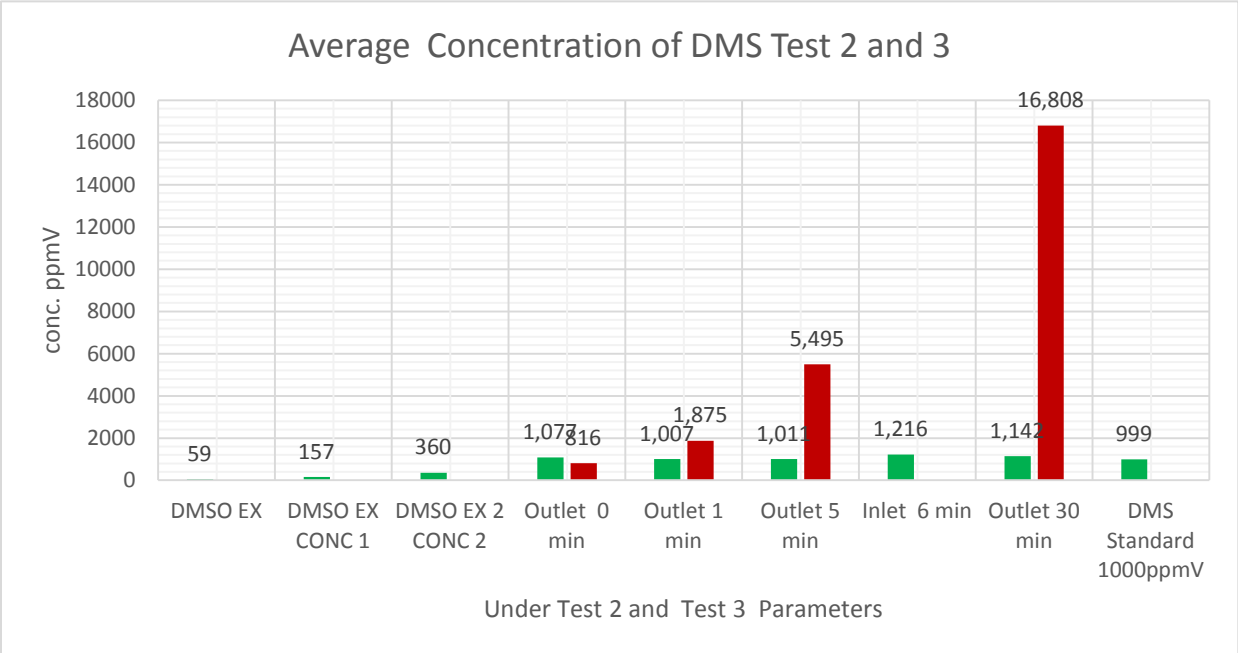
ii. **Test 3**: Immediately after sampling at 1 minutes: The Stage 1 and Stage 2 Spray system were turned on and the ECC-1 and ECC-2 switched on. The next sample was taken at the outlet of the system at 5 minutes from initiation.

iii. Sampling was done thereafter at 10 minutes, 20 minutes and 30 minutes.

Table 2: Test 2 and 3 Parameters

ECC-1							**Chiller**	**Blower**	**LFG Flow**	**LFG Temperature**
	Date	Start Time	End Time	Solution	Voltage	Amps		%	scfm	F
Test 2	6/24/15	1205	1240	DMSO/Salt water	41.1	36	ON	33	20	95
Test 3	6/24/15	1515	1545	DMSO/Salt water	41	53	ON	34	20	95
ECC-2										
		Solution	Voltage	Amps 1	Voltage 2	Amps 2	pH Initial	pH Final		
Test 2	6/24/15	DMSO/Salt water	21	62	21	46	14	12		
Test 3	6/24/15	DMSO/Salt water	20.7	51	20.6	82	14	14		

Figure 2: GC TCD Analysis Results of Test 2 and 3



Discussions: As can be observed from the above graphics, the outlet concentrations of DMS actually increased substantially, (red bars), as compared to the average DMS input of 999 ppmv DMS. It is conjectured that the DMSO solvent used in stage 1 was actively breaking down by disproportionation to DMS, based on the following equation: $2(CH3)_2SO = (CH3)_2S + (CH3)_2SO_2$.

A detailed literature survey, post-experimentation, reveals that the same is possible under certain conditions. Disproportionation of DMSO is catalyzed by UV light, and occurs at elevated temperatures for extended periods of time (>150^oC for 24 h). Using National Bureau of Standards thermodynamic parameters, Wood estimated that the disproportionation of DMSO is favorable (ΔG^o = - 98 kJ/ mol). Ab initio calculations using B3LYP/6-31G theory and basis set in Gaussian 09 also indicate a similar finding, i.e. ΔG^o = - 57 kJ/ mol in the gas phase and ΔG^o= - 58 kJ/ mol in DMSO. While calculations indicate that disproportionation of DMSO is thermodynamically favorable, in normal DMSO solutions, it may not be kinetically favored, due to the small amounts of DMS detected in DMSO. However, in ECC-1, the electrolytic conditions seem to favor DMSO reduction to DMS, instead of DMS oxidation to DMSO (as desired, but not observed).

Test 4: Accordingly, based on previous experiments conducted by Nexo Solutions, using oxidants like NaClO, H_2O_2 and ozone, wherein they has observed significant decrease in DMS levels when using NaClO, it was decided to use NaClO solutions (6.25% in water) to try to oxidize the DMS in the gas to more benign forms, while using the ECC-1 and the ECC-2 to regenerate the consumed NaClO *in situ*, by electrolysis of the spent NaCl solutions, a well-known industrial method for production of sodium hypochlorite by brine electrolysis in membrane-less electrochemical cells.

Test 4 Results:

Test protocol:

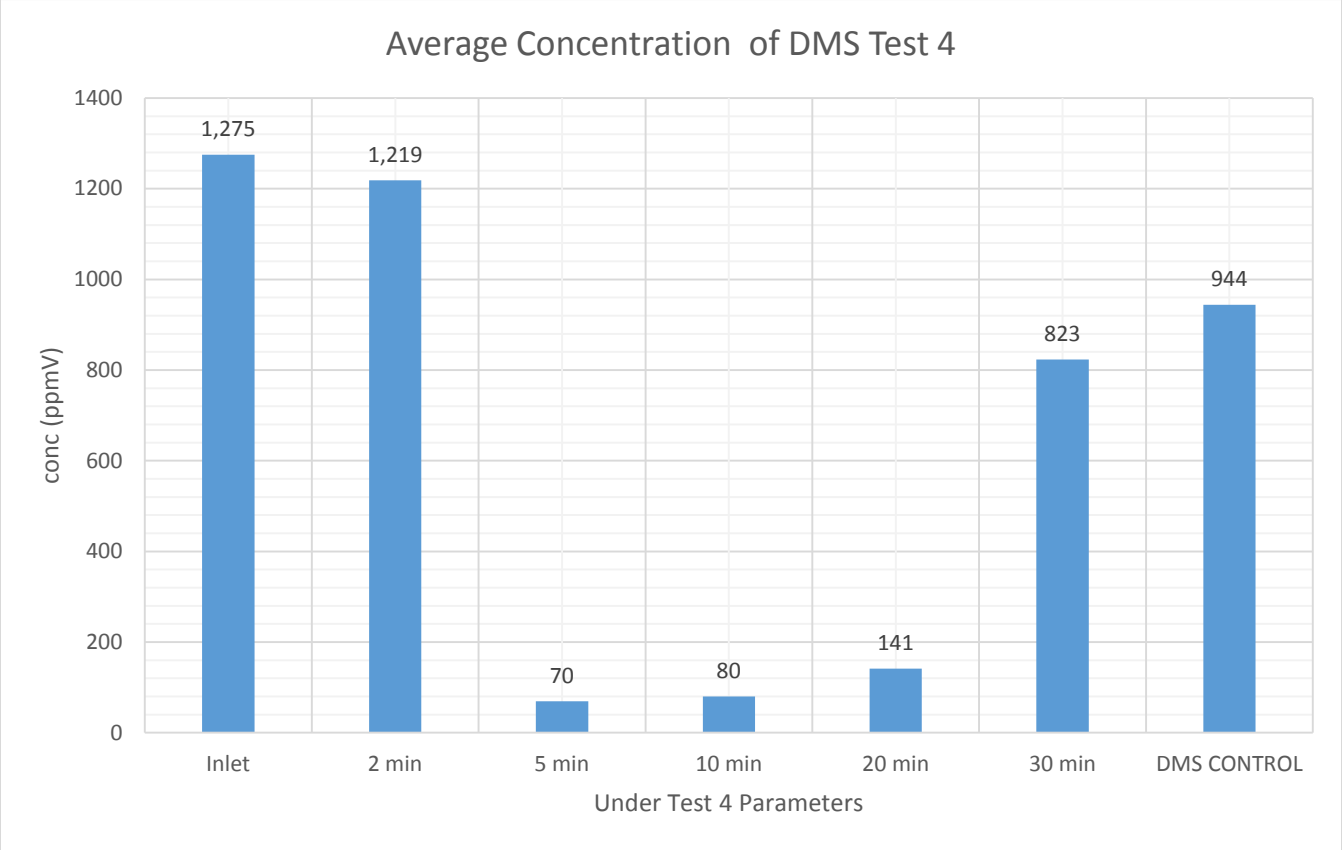
i. Inlet was sampled with the system equalized with LFG and flow assisted by a blower.
ii. To test DMSO2 effectiveness in removing contaminants the system was sampled in after 2 minutes.
iii. 6.25 % NaOCl was used as the scrubbing and oxidizing solution in both ECC, pH was adjusted with caustic soda.
iv. Immediately after sampling at 2 minutes. The Stage 1 and Stage 2 Spray system were turned on and the ECC-1 and ECC-2 switched on. The next sample was taken at the outlet of the system at 5 minutes from initiation.
v. Sampling was done at 10 minutes, 20 minutes and 30 minutes.

Table 3: Test 4 Parameters

	ECC-1						Chiller	Blower	LFG Flow	LFG Temperature
	Date	Start Time	End Time	Solution	Voltage	Amp 1		%	scfm	F
Test 4	6/25/15	1330	1400	6.25 % Bleach and NaOH	34.2	125	OFF	60	50	84.5

ECC-2										
		Solution	Voltage	Amps 1	Voltage 2	Amp 2	pH Initial	pH Final		
Test 4	6/25/15	6.25% Bleach and NaOH	16.9	40	15.3	47	14	5		

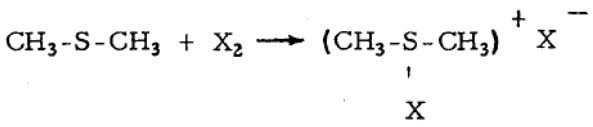
Figure 3: GC TCD Analysis Results of Test 4



Discussions: As can be observed from Figure 3 above, during the first 20 minutes, significant amounts of DMS removal was observed, but the 30-minute reading showed increased levels of DMS in the scrubber outlet samples. This leads us to believe that all the hypochlorite had been consumed for the oxidation of DMS (and other organic chemicals in the condensate too). The *in situ* generation of NaClO by brine electrolysis was deemed insufficient to provide sufficient oxidation of DMS, both due to electrode constraints as well as the high level of organic contaminants in the LFG flows. The latter significantly reduced electrolytic conductivity and efficiency, as could be seen from the parameters of decreasing voltage in the DC power supplies.

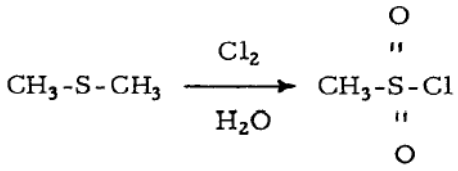
In addition, samples of the LFG outlets during the first 20 minutes, while showing no evidence of DMS (based on a simple smell test), did show evidence of chlorination compounds of DMS (the smell of which is quite distinctive from that of DMS itself). A survey of literature (from publications of Gaylord Chemicals, a major industrial producer of DMS and DMSO) shows the following:

Reaction with Halogens
(a) At Low temperature, anhydrous,



These crystalline adducts are known for chlorine, bromine and iodine. The chlorine compound is unstable above -10° C and rearranges to monochlorodimethyl sulfide above that temperature. Hydrolysis of the bromine and chlorine adducts produces dimethyl sulfoxide (DMSO). The adducts may serve as mild halogenating agents and the bromine complex has been used to brominate aniines, amides and olefins.

(b) In aqueous suspension[2, 3]



DMS has been converted to mesyl chloride by chlorination in water in 50-60% yields. The yield can be increased to above 75% by first chlorinating the sulfide to at least the monochloro stage before introducing water.

Based on the above, *in situ* generation of NaClO may not be the best pathway to regenerate the hypochorite oxidant solution, since any aqueous chlorine generated could react with the DMS to form organic sulfyl chlorides, instead of forming the hypochlorite ion.

Conclusions and Pathway Forward: Based on the results seen in the above experiments, we unfortunately have to report that DMS removal was not observed in the various tests, except where bleach solutions were used in varying concentrations (12.5 and 6.25% in water).

We recommend further testing be performed to lower the level of sulfur compounds in the Bridgeton LFG gas flows.

1. Oxidation of the sulfur compounds by NaClO, but with the NaClO regenerated by electrolysis of *ex situ* salt solutions, in separate electrochemical cells. The DMS gets preferentially oxidized to a liquid product, DMSO, by the hypochlorite solution. The combined NaCl (from the

degradation product of NaClO, bleach) and DMSO solution would now need to be separated from each other, probably by nano-filtration membrane techniques, whereby the NaCl aqueous solution is converted to an NaClO solution by ex situ electrolysis of the separated brine. Membrane systems with a MWCO (molecular weight cutoff), capable of separating aqueous NaCl from DMSO currently exist.

2. US Patent 4431617 A described removal of sulfur compounds from flue gases generated from paper pulp operations by absorption of DMS, H2S and methyl mercaptans in solutions of sodium sulfide. The reactions quoted in the patent are as follows:

In the absorption and recovery of the TRS gases and sulfur dioxide in accordance with this invention, wherein green liquor is used for scrubbing, the TRS gases are absorbed rapidly by the sodium sulfide in the liquor according to the following reactions to form sodium hydrosulfide and methanol:

For Hydrogen Sulfide: $H_2S+Na_2S=2NaHS$

For Methyl Mercaptain: $CH_3SH+Na_2S+H_2O=2NaHS+CH_3OH$

For Dimethyl Sulfide: $CH_3SCH_3+Na_2S+H_2O=2NaHS+2CH_3OH$

The NaHS produced can be regenerated to Na_2S by conventional electrolysis in water-based media. However, the high amounts of methanol generated by the reaction of the sodium sulfide with DMS and methyl mercaptans would be a problem for leachate treatment. In addition, the presence of carbon dioxide in the LFG could complicate reactions.

3. Nrgtek's preferred pathway would be to preferentially absorb the DMS and other organic contaminants in a suitable solvent (an acid solution with 25-30% tetra-glyme or perfluoropolymers, the latter also being non-flammable and non-oxidizable, since the fluorine bond is much stronger than the oxygen bond), and subjecting the contaminants in the liquid phase to ozone to preferentially oxidize all these organic molecules and any H_2S dissolved in the liquid phase. Even though the Nexo Solutions experiment with ozone was not successful, it is conjectured that the observed results were due to attempts to oxidize the DMS in the gas phase, where contact time issues and scrubber design probably resulted in the results obtained. An advantage of this pathway would be the much easier pre-treatment of the LFG flow, since water vapor would not be miscible with the preferred solvents, and all organics (including hydrocarbons and DMS/DMDS, mercaptans and other organic sulfur compounds) would be oxidized by the ozonation treatment. Methane, CO_2 and H_2 are not soluble to any appreciable extent in the solvents, and thus would remain in the gas phase.

Nrgtek Inc. is very grateful for being given this opportunity by Technip, Stone and Webster Inc., SCS Engineers and Republic Services for investigating various technologies for removal of contaminants from the landfill gas at the Bridgeton Landfill. If any further efforts need to be investigated for the same, we herewith would like to offer our continued services to solve this chemically and technically difficult problem.

Appendix F

SCS Field Logs

June 15 – Initial Startup

- Arrived no site at 10:15 and received Health and Safety training. The piping work still ongoing on site.
- Waste water drain sample lines on the scrubber with ball valves are being installed.
- Bridgeton personnel are bringing in the chemicals to the flare yard, setting up pumps and airlines and other associated parts.
- Ozone generator is being connected.
- Nexo wanted to install the flow meter on the discharge side of the scrubber to regulate the flow better. It was kept at the location it was installed as SCS did not see a reason for it.
- Nexo installed new gaskets on the scrubber tower lids and inspected the packing material.
- SCS purchased a cooler, ice and 1-gallon water bottles for wastewater samples.
- Started dry run of the system at 4:15pm by recirculating water and running LFG through the scrubber. We took various flow readings by keeping HV-1 fully open and regulating the discharge valve HV-2.
- Valve ½ open: 203.3 scfm
- PT-1: 27.1" w.c.
- PT-2: 14.9" w.c.
- Valve Fully Open: 275 scfm
- PT-1: 10.2"
- PT-2:-12.4" w.c.

- We tried to fine tune the flow by throttling HV-2. The digital manometer readings are not very stable. Plus-minus 1.0 to 1.5" w.c. which affect the flow calculations. We will take frequent pressure reading during tests.
- Nexo did not bring a sample pump to draw samples should the scrubber is under vacuum.
- Draining the sumps is a very slow operation. Even keeping the scrubber pressurized while draining is a slow process. We opened up the cleanout ports to inspect the sumps. Sump 1 seemed dirty, flushed it with water. Sump 2 was not draining fully. When it was drained finally, we noticed that packing material at the bottom of the sump. Nexo thinks that it must have come loose during shipping when the scrubber was laid on its side. The

packing material was also blocking the drain line. They plan to run the tests as scheduled anyway. The sump 2 seems also dirty, we flushed it with water.

- Nexo started filling the sump1 with NaOCL solution, but started having issues with hose connections on the pump. We filled up some but continue tomorrow.
- GC reads DMS around 1,200 ppm. As the sample sits on the table, the DMS concentration seems to go up. They suspect that H2 gas might be coming out of the tedlar bag since it's a small molecule resulting in increased concentrations of remaining compounds. The calibration gases used for the GC seem way out of ranges compared to the LFG composition at Bridgeton. (i.e. 10,000ppm for H2S and 93% for CH4).
- Nexo will take sample during the tests and measure the pH with a meter or pH paper.

June 16 – Nexo Test #1

- We took an LFG sample from the same location, and ran it on GC, results are:
  - DMS-1,111ppm
  - Methyl Mercaptan: 270ppm
  - Propyl Mercaptan: 34 ppm
  - t-Butyl Mercaptan: 42ppm
  - H2S: 60ppm
  - CH4: 8.5%
  - CO2: 28.1%
  - N2+O2: 50.9%

- At 11:15 am, we filled the sumps with 12.5% hypochlorite solution up to minimum liquid level. Liquid height is approximately 20.75' in each sump. Sampled from sump 1 and analyzed for pH. Initial pH is about 13. Nexo is measuring pH with pH papers. The meter brought on site doesn't seem to give correct results.

- At 2:06pm, we established LFG flow at 134scfm (PT-1: 20.5". PT-2:15.3")

- pH and LFG flow were periodically measured during the test. Differential pressure across the plate is around 4.8" to 5.3" which corresponds to flow of approximately 130scfm.

- At 14:45, the pH was about 7.37 with meter.

- We stopped the recirculation pumps, and closed HV-1 and HV-2 around 3:15pm.

- Initial results indicate that outlet DMS concentration is around 160 ppm. NEXO is taking LFG samples approximately every half hour at the inlet/intermediate/and outlet locations into tedlar bags.

- The connections for the injection pump is complete, re-established LFG flow and started the unit around 4:15pm.

- At 6:30pm, we increased the recirculation flow rate to 20 gpm. pH is kept around 10 by injecting NaOH. The injection rate seems to be 1.2 gallons per hour measured with a volumetric column and a stop watch. We took LFG samples and 6:30 and at 6:50pm while the recirculation rate was 20gpm. Later found out that the pH was never above 6 during this test.

- The analysis results indicate that the outlet concentration went up to around 1,000ppm in 6:30pm samples. NEXO concluded that the oxidizing solution is spent. Approximately, in 3 hours of run time, we used up the 12.5% HOCL solution with 130scfm LFG flow, while injecting 1.2 gallons per hour of NaOH. The original consumption estimate was 60 gallons per 8 hour.

- SCS collected wastewater samples at 8pm from sump 1 into 6 – 1 gallon bottles and delivered to waste water treatment plant.

- David Engel suggested that we should use the first scrubber as a water wash to get the water soluble compounds out of the gas, followed by chemical scrubbing. This might reduce the chemical consumption rate. We also talked about activated carbon as a pretreatment for the chemical scrubbing system as an option.

June 17 – Nexo Test #2

- Morning: When we filled up Sump 2 with peroxide, we noticed that it was giving off gas. When we closed the cleanout port and fill port, the pressure started building up inside the scrubber. It went from 30" to 75 inches within a minute (I monitored this with the digital manometer at MP-3). (This is with HV-2 closed). Heath opened up the fill port quickly and the cap blew off. Heath wants to get a pressure relief valve during the test as a safety measure.

- Afternoon: We started the recirculation pump for Sump 1, set the rate at 15 gpm. Set the LFG flowrate at around 130 scfm (differential pressure across the plate is approximately between 4.8" and 5.3").

- Initial pH of Sump 1 and Sump 2 are approximately 6 (at 4:35pm)

- Started adding NaOH; got the pH to about 8. The caustic injection rate is 2.175 gallons per hour. Rechecked the LFG flow, adjusted to HV-2 valve so that the differential pressure across the plate is around 5" w.c. (it was reading slightly lower).

- Nexo took inlet, intermediate and outlet samples at 4:30pm.

- NEXO started noticing that hydrogen peroxide was not being recirculating inside the scrubber due to gas and foam formation inside the scrubber. We noticed the temperature and pressure of the scrubber going up.

- In a matter of 15 minutes, the pressure and temperature built up so much that we had to open up the HV-2 fully, and open up the 2" fill port to vent off gases. The

temperature was over 200F. The violent reaction stopped in about 10 minutes. Nexo added water inside the scrubber to cool it down.

- In order to figure out what was causing the unexpected reaction, we ran the following tests using buckets, the chemical solutions, and tubing with ball valve to bubble LFG into the bucket

1. H2O2 + Bleach + Caustic
    a. H2O2 and beach were mixed approximately 1:1 ratio in a bucket, when adjusted the pH with caustic, it reacted violently, foaming, giving off heat and vapor/gases.

2. H2O2 + Bleach (no caustic) – mildly reactive
3. H2O2 (50 parts) + Bleach (1 part) + Caustic – Non- Reactive
4. H2O2 + Water from sump 1+Caustic – Violent Reaction
5. H2O2 + LFG+ Condensate+Caustic – Violent Reaction after 28 minutes
    a. The condensate was drain form LFG pipe low point, also bubbled LFG into the solution.

6. H2O2 + LFG+Caustic (no condensate) Not reactive (this experiment is same as No. 5 but without condensate. No reaction after over an hour. We continue with this today.
7. H2O2 + Caustic – Not reactive
8. H2O2 + Waste Bucket – Violent Reaction
    a. This is the waste bucket that we were using during tests to get small samples for pH measurements yesterday that had bleach in it.

June 18 – Nexo Test #3

- Dual Water Wash Test No. 1
    - Set the LFG flow rate so that delta P is approximately 4.8" ~5.3"w.c. Started the test at 1:55PM.
    - Initially, we saw 60 percent reduction in DMS. In 45-50 minutes, the water was "spent".

- Dual Water Wash Test No. 2
    - Differential pressure across the plate is around 1.5~2.0" w.c. (70~80scfm).
    - Started the test at 5pm.
    - 5:05pm 340ppm (DMS)
    - 5:15pm 550ppm
    - 5:25pm 600ppm
    - 5:35pm 710ppm
    - 5:45pm 880ppm
    - 6:15pm 920ppm
    - 6:25pm 1075ppm (DMS)

June 18 – Nexo Test #4

- Water Wash and bleach

- Sump 1: Water (24-inch height), 25gpm, pH: 5 at 7:15pm
- Sump 2: Bleach (21-inch height, ~2-1/2 drums), 10gpm, pH: 12-13 at 7:15pm
- At 7:20pm, flow check, delta P= 1.5" – 2.0" w.c.
- Sump 2 pH is still about 12-13 at 7:22pm.
- Adjusted the LFG flow to delta P ~ 5" w.c. at 7:25pm.
- At 7:32pm, pH= 5~6, started adding caustic.
- Adjusted the LFG flow to delta P ~ 5" w.c. at 7:40pm.
- 8pm, Sump 2 pH=~8; 100F
- Caustic Injection rate = 6.3 gph
- (Heath indicated that during the first bleach test pH was around 5~6 the entire test, he was never able to get it above that except for the first initial portion of the test using the 1.2 gph injection rate).
- 20:25pm; pH=8.7 (bleach)
- 20:30pm; pH= 5.5 (water)
  21:05pm; pH=8.9 (bleach)
- 21:24pm: pH=9.2 (bleach)
- At 20:20, Heath emptied half the water wash while recharging it with fresh water.
- Inlet LFG Sample: 1135ppm DMS
- 9:30pm sample: 957ppm
- In 2.5 hours, both water and bleach solution were depleted.

June 19 – Nexo Test #5

- Nexo is getting the ozone generator started by just purging O2 gas. Set the O2 tank pressure at 25psi. We filled both Sump 1 and Sump 2 to minimum liquid level. At 10:30am, set the LFG flow rate so that delta P across the orifice plate is 5" w.c. (130scfm)
- Started the test at 11:00am and took initial samples from inlet/intermediate and outlet. Ozone generating Capacity is set at 50%.

- After first sampling, the ozone generation capacity is increased to 90%. The LFG coming out from MP-3 has cloudiness to it, with a distinct odor (not sulfur, or ozone).
- At 11:20am, took another set of samples, we then reduced the ozone generating rate to 20%.
- At 11:40am, took another set of samples.
- Water Wash + Ozone at11:00am 1062 Inlet/136 Intermediate/XX Outlet (50% capacity)
- Water Wash + Ozone at11:05am 429 Outlet (20% capacity)
- Water Wash + Ozone at11:20am 244 Outlet (90% capacity)
- Water Wash + Ozone at11:40am 829Outlet (20% capacity)
- Initial review of the data suggests that ozone injection did not have a noticeable effect on the sulfur removal. In less than 1 hour, the sulfur removal was virtually non-existent.
- Nexo drained and shut down the scrubber, got the ozone generator for shipping on Monday, cleaned the office trailer for the next test.
- We repeated the bucket test on both Thursday and Friday with hydrogen peroxide/condensate/LFG but we could not get the same reaction were getting on Wednesday.
- Initial review of the data suggests that ozone injection did not have a noticeable effect on the sulfur removal. In less than 1 hour, the sulfur removal was virtually non-existent.

June 19 – Nexo Test #6

- Carbon
- Republic delivered some samples taken from different locations. The samples were taken with a GEM. Two (2) initial samples were taken with and without the carbon filter:
- GEW126 – 15ppm DMS with the carbon filter, 774 ppm without the carbon filter. (0.5%, and 1.0% CH4)

June 20, 2015, Saturday

Discussions with Russ:

- Ask welder to get ports on the Vapor Tech Scrubber? Two for each sump? pH and ORP?
- 6,000 scfm vapor Tech Unit; 3 scrubbers, one for water wash, and the other two on lead /lag operation.
- Get sampling pumps for LFG sampling from pipe under vacuum, do not use GEM.
- Research into activated carbon given that GEM filter removed 98 percent.
- Improved bucket test, would the DMS taken during waterwash would come out of water if agitated? Test setup? Closed vessel?
- NRGTek arrived on site at 11:50AM. Republic unloaded the skid from the truck and set it next to Nexo skid. During transport, the outlet flange weld from the first scrubber broke off. Mike of Republic scheduling a welder to come out on Monday morning to re-weld.
- Some of the pieces from the skid need some assembling.
- Check if Sodium perchlorate solution has arrived.
- Republic got the piping, fittings, and valves at the site, will fuse and install on Monday.

NRGTek Skid Components:

- Inlet Sump
- Blower (1)
- Chiller (2)
- Venturi Scrubber/Chemical Injection (2)
- Electrolyzer (2)

June 22, 2015, Monday

- Health and Safety Training with NRGTek staff (Subra, Ed Robinson, Daudy).

NRGTek System Components

- Two (2) 12-gpm solvent recirculation pump
- Four (4) pumps to recirculate the liquids in ECC through the filters to collect solids formed (i.e. elemental sulfur or DMSO2).
- Chiller to cool the LFG temperature to X. We will measure the temperature during test.
- Centrifugal Blower (belt driven) to pressure the gas (will test the skid with both blower on and off). The blower has a VFD.
- Two (2) venture scrubbers (where DMS is selectively removed with DMSO solution)
- Two (2) elecro-catalytic converters (where oxidation takes place and solids are formed)
- Control panel to monitor the voltage and amps in ECCs, to control blower, chiller and pumps.

- DMSO is used as a solvent in the first stage. It is hoped that it will selectively remove DMS (non-polar molecule) which is miscible with DMSO (polar molecule)) from the gas stream. But it may also attract other constituents in gas.
- NRGTek assembled the loose parts on the skid. AEG installed all the piping and valves. Chiller has a condensate line, which still needs to be connected to the existing drain line. More monitoring ports are also to be installed tomorrow.
- Twenty (20) 4L DMSO bottles were pumped into stage 1 ECC. NaClO3 (Sodium Perchlorate) solution (5-gallon solution) was prepared and pumped into Stage 1 ECC as the electrolyte.
- Salt water solution was prepared (5kg of salt mixed with 5 gallons water) six times and was pumped into Stage 2 ECC. We measured the weight of salt with bathroom scale. Some of the recirculation pump fittings were loose and leaky. Ed tightened those.
- Started the solvent recirculation pumps on the panel and started reading voltage and amperage across each ECC. (Stage 2 ECC is divided into 2 banks). There are a total of three (3) sets of voltage/amperage readings).
- There is good voltage in stage 1 ECC (30V) but we are getting low amps across stage 1, indicating that the conductivity is low in the solution. Also, the ECC temperature is increasing, meaning that there is high resistance in the cell. NRG drained some of the solution from the Stage 1 ECC, and recharged it with salt water to increase conductivity.
- Stage 2 ECC is reading good voltage but low amps. Ed confirmed with multi-meter that there is sufficient amp in Stage 2 (15V, and 30amps) for each bank.
- NRG will do some troubleshooting to get the desired V/Amps across each ECC tomorrow morning.
- We took initial flow readings with Subra's flow meter. We determined that we don't need a blower to push LFG flow across the skid. Subra prefers higher pressures to increase efficiency of the system. We will run tests with blower on and off. Lower pressures (or vacuum) may desorb the absorbed contaminants from gas stream.

June 23, 2015, Tuesday

- AEG completed the condensate drain piping from the Technip's skid chiller.
- NRGTek relaced the blown fuses on the panel.
- We are still getting very low conductivity in Stage 1 ECC, trying to figure out what might be the issue (i.e. insufficient electrolyte, ECC damaged during transport, electrical problem). NRGTek checked all the electrical connections, tightened up loose ones. The fuses are getting blown, replaced the existing 40amp fuses with new 60amp fuses. Ed thinks that the backsplash through the transformers are causing it. Replacing the fuses seems to have solved the problem.
- Republic is collecting LFG samples for weekly lab testing. We took samples from the same location for GC analysis.
- 3kVa – 15amp service for the chiller on NRGTek skid.
- Still getting low amps in ECC-1 (15.1V, 2A), drained two (2) 4L bottles (2.1 gallons) from ECC-1 at 10:45am). Re-charged ECC-1 with 30 percent 5-gallon solution. We are still getting about 4 amps. (3.5 kg of salt in 5 gallon water). NRGTek suspects that the stage 1 ECC might be damaged during transport. They plan on opening it up and checking it.
- We went ahead and start testing, keeping the ECC-1 offline, but still spraying solvent into the scrubber. Stage 2 was run as intended.

<u>1:30pm, start test.</u>

- NRG-OUT: +22" w.c., 104F. Jacket water is set at 38F.
- 18-20cfm with velocity meter, delta P across plate is 0.7-1.5" w.c.
- ECC-1 Bank 1 16.5V 24amps
- ECC-1 Bank 2 16.5V, 40amps
- Took samples at 1:35pm
- Increase the voltage to 17.5V after first sampling.
    - ECC-1 Bank 1 17.5V 28amps
    - ECC-1 Bank 2 17.5V, 47amps
- CT14:130F, BL-IN:120F, BL-OUT:150F

The initial Test -1 results of liquid solvent technology

- Set the LFG flow at 20 scfm.
- Run Stage 1 as "Solvent Spray" mode only, electro-catalytic converter (ECC-1) was not run due to low conductivity of the solution. (The original function of ECC-1 is to oxidize DMS into DMSO).
- Run Stage 2 as designed (i.e. salt water spray and ECC-2 running). (The original function of ECC-2 is to oxidize DMSO to $DMSO_2$).
- Took initial inlet, 5^{th} minute outlet, 20^{th} minute outlet, and 35^{th} outlet minute samples.

- The GC runs indicated that inlet and outlet DMS concentrations were around 1,200 ppm for all samples. The system did not remove H2S or mercaptans either.

Planned Tests to run on Day 3 and Day 4:

- Test 2: Charge both ECCs with solvent and electrolyte, run the both stages as designed. Collect samples for testing.
- Test 3: Modify the Technip skid as "packed bed reactor". Packed bed will consist of "$DMSO_2$". Run LFG through packed bed, which will generate DMOS (liquid), direct DMSO to ECC to convert it back to $DMSO_2$. ECC requires high pH (greater than 9) for H2S and mercaptan removal.
- Other tests; to be determined in the field based on results.
- Drained the liquid from ECC-2, dark brown liquid with odor, dump it into 55 gallon drum, then drained it into CT-14. Liquid in ECC-1 is still clear but odorous (DMS like smell) indicating DMS mixed with DMSO. Recharged ECC-2 with solvent solution from ECC-1, still getting low amps suggesting that both ECCs operating properly. We will recharge both ECCs with solvent solution with high electrolyte and run the system that way tomorrow.
- David and I collected samples with carbon filter. We noticed approximately 70 percent DMS removal. NEXO suggested using coalescing filter to remove liquids from gas before running it through activated carbon to extend its life. We will do more tests using water traps first.
- Ozone generator shipped backed.

June 24, 2015, Wednesday

- We charged both ECC-1 and ECC-2 with the same solution, approximately 20 percent DMSO and remaining with salt water. We think that in yesterday's experiment, DMSO was saturated so quickly because DMS was not being converted to DMSO (ECC-1 off due to low amps) hence we see no removal of DMS, nor regeneration of DMSO.
- We will add caustic to both ECCs to maintain the pH high.
- Set the LFG flow so that flow is about 20 scfm. The blower is on at 33% speed. The pressure on the Skid is about 50" w.c. pH is 14, the LFG temperature in NRG skid is 89F. The LFG temperature on blower outlet is 112F.

12:05PM
21V 36A Stage 2A
21V 62A Stage 2B
41.1V 46A Stage 1

- Took initial, 30 seconds, 1st minute, 5th minute, and 30th minute samples.

- pH after the test is still 14 indicating that no CO2 got into ECC to drive the pH down. We suspect that the contact time in the venture scrubber is too short for efficient DMS removal. We retrieved some plastic packing material from the KCH scrubber and packed the venture scrubbers with it to increase the contact time.
- We started running the second test with packing material. Set the flow is about the same; delta P across plate is about 0.5" w.c. Velocity meter is not functioning. Blower speed is 34%, initial pH is 14. The LFG temperature in NRG skid is 95F, temperature from blower discharge is 118F. Final pH is approximately 12.
- Took initial, 30 seconds, 1st minute, 5th minute, and 30th minute samples.
- Both test results are summarized in the table below.

3:15PM
20.7V 51A Stage 2A
20.6V 82A Stage 2B
41.0V 53A Stage 1

Sample Time	Test 1 with Venturi Scrubber						Test 2 with Venturi Scrubber Packed					
	DMS		H_2S		Mercaptans		DMS		H_2S		Mercaptans	
	Run 1	Run 2	Run 1	Run 2	Run 1	Run 2	Run 1	Run 2	Run 1	Run 2	Run 1	Run 2
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Initial Sample	1025	1116	40	50	151	137	1143	1169	40	50	135	139
30 second Outlet	986	1028	0	0	0	0	805	826	0	0	0	0
1st minute Outlet	896	1028	0	0	0	0	1838	1926	0	0	0	0
5th Minute Outlet	982	1038	0	0	0	0	1524	1565	0	0	0	0
30th Minute Outlet	1100	1183	60	60	144	151	16637	16978	0	0	0	0

- We modified the skid inlet such that we could pack it with DMSO2 solid material. We will run the modified system with the same solutions from yesterday as a first attempt.
- Secondly we will run the modified system with ECCs charged with Sodium hypochlorite solution. It will basically replicate the chemical scrubber tests but it'll be in regeneration mode. The bleach consumed during test should be electrolyzed to be regenerated.

June 25, 2015 Thursday

- NRGTek is preparing solutions for the tests.
- 55-gallon drum filled with 30 gallons of water, 20 gallons of bleach and 1.5 gallons of NaOH. Drained ECCs, and charged it with the bleach solution. This basically replicates the Nexo test with diluted bleach, approximately 6 percent. Initial pH was XX.

- We received the DMSO2 (20-500 grams), packed the modified inlet with $DMSO_2$. Re-assembled the modified inlet and get it ready for the test.
- Set the LFG flow rate around 40-50scfm. It is difficult to get flow readings when the NRGTek blower is on. The blower speed is set at 60 percent. Took 0-min, 2-min (no ECC), 5-min (with ECC), 10 min, 20min, and 30 minute samples.
- The results indicate that DMS was being removed but the bleach solution was not regenerated. The chemical was consumed about 25 minutes, and DMS removal was ceased.

Appendix G

Miscellaneous Data Collected

Miscellenous Field Readings taken During Pilot Tests

Date	Time	MP-1 (Blower Discharge)		FL-100	FL-120	FL-140	Total LFG Flow	Skid Inlet Vacuum	LFG Inlet Temprature	LFG Discharge Temprature	LFG Temprature CT-14	Vacuum CT-15
		in-w.c.	GEM Reading % (CH_4/CO_2/O_2/Balance)	scfm	scfm	scfm	scfm	in-w.c.	^oF	^oF	^oF	in-w.c.
June 9, 2015				2,235	2,435	2,315	4,703	-40				
June 15, 2015	3:15 PM	26.5	9.6/38.2/9.2/42.7	2,025	2,247	2,363	4,637	-40	99.1	116.7		27.3
June 16, 2015	8:30 AM	26	8.9/35/10.4/45.8	1,927	2,474	2,205	4,636	-40		110		
June 16, 2015	1:00 PM	25	9.5/40.6/8.9/40.6					-39.8	109	124		
June 17, 2015	8:30 AM	26.7	9.1/37.9/10.2/42.1	2,402	1,863	2,293	4,678	-39.8	97.9	109	117	-29.4
June 17, 2015	4:13 PM	25.4		1,813	2,440	2,168	4,495			105		-30.3
June 18, 2015	9:30 AM			1,603	2,321	2,265	4,419	-39.3				
June 18, 2015	5:00 PM								107	120	120	
June 19, 2015	4:14 PM	23		1,656	2,371	1,975	4,268	-39.5	93.5	98	112.5	-31.6
June 22, 2015	9:30 AM	24.5		2,051	2,252	2,176	4,509	-39.8	107.7	112	123	-29.8
June 23, 2015	9:30 AM								79	106	119	
June 23, 2015	1:30 PM								120	150	130	
June 25, 2015	9:50 AM	26.2	8.0/32.2/10.4/49	2,097	2,004	2,253	4,526	-39.8	99.4	103	116	-30.2
June 26, 2015	11:27 AM	24.9		1,953	2,363	2,001		-39.2	100.8	104.5	122	-30.4

Appendix H

Wastewater Analytical Data

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

TestAmerica Job ID: 160-12349-1
Client Project/Site: Bridgeton Landfill - Scrubber Water

For:
Republic Services Inc
Bridgeton Landfill Authority Division337
13570 St Charles Rock Road
Bridgeton, Missouri 63044

Attn: Derek Bouchard

Authorized for release by:
7/6/2015 4:38:19 PM

Erika Gish, Project Manager II
(314)298-8566
erika.gish@testamericainc.com

Table of Contents

Job ID: 160-12349-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Republic Services Inc

Project: Bridgeton Landfill - Scrubber Water

Report Number: 160-12349-1

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 some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The sample was received on 6/17/2015 7:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.8º C.

Receipt Exceptions

Nitric and sulfuric bottles were received with pH of 7 and NAOH and NAOH/Zinc Acetate bottles both have a pH of 10. Added more preservative to each and nitric and sulfuric bottles pH remain at 7. NAOH and NAOH/Zinc Acetate bottles now have a pH above 12.

TCLP VOLATILE ORGANIC COMPOUNDS (GC-MS)

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for TCLP volatile organic compounds (GC-MS) in accordance with EPA SW846 Method 1311/8260C. The samples were leached on 06/18/2015 and analyzed on 06/18/2015 and 06/19/2015.

Analytical Batch 196001

The continuing calibration verification (CCV) associated with batch 160-196001 recovered outside recommended criteria, minimum relative response factor for 2-Butanone. A reporting limit (RL) standard was analyzed, and the target analyte was detected; therefore, the

Job ID: 160-12349-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

data have been reported.(CCVIS 160-196001/3)

Due to the high concentration of 2-Butanone, the matrix spike / matrix spike duplicate (MS/MSD) could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria. 2-Butanone will be reported from a dilution of the sample.

Analytical Batch 196251
In batch 160-196251 , the following sample was analyzed at reduced volume due to high concentrations of 2-Butanone (MEK): SCRUBBER TEST 6-16 (160-12349-1). The reporting limits have been elevated by the appropriate factor.

The continuing calibration verification (CCV) associated with batch 160-196251 recovered above the upper control limit for analytes. The sample associated with this CCV was re-analyzed at a dilution for 2-Butanone (MEK) only and 2-Butanone (MEK) has a passing %D; therefore, the data have been reported. (CCVIS 160-196251/3).

The continuing calibration verification (CCV) associated with batch 160-196251 recovered outside recommended minimum relative response factor criteria for 2-Butanone (MEK). A reporting limit (RL) standard was analyzed, and the target analyte was detected; therefore, the data have been reported.(CCVIS 160-196251/3)

additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC MS)
Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for volatile organic compounds (GC MS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 06/24/2015 and 06/25/2015.

Analytical Batch 197153
According to the COC, sample was presumed to be preserved to a pH < 2. Due to the potential loss of volatile constituents, VOA vials are not checked for pH preservation until the time of analysis. Sample pH was not less than 2. Sample was analyzed outside the 7 day, unpreserved, holding time.

The following sample was analyzed at reduced volume due to high concentrations of target analytes: SCRUBBER TEST 6-16 (160-12349-1). The calculation was done using an initial volume adjustment and a dilution factor. The reporting limits have been elevated by the appropriate factor. The original dilution was performed due to strong sample odor; the higher level dilution was due to high target analytes in the original dilution.

The following compounds did not meet the minimum relative response factor limits in the continuing calibration verification (CCV) associated with batch 160-197153: Acetone, Methyl acetate, and 2-Butanone. A low-level CCV was analyzed at the reporting limit (5ug/L) and the affected analytes were detected. Target analytes recovering above the reporting limit will be qualified and reported. (CCVIS 160-197153/4)

The continuing calibration verification (CCV) associated with batch 160-197153 recovered outside acceptance criteria, low biased, for Vinyl chloride. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported. (CCVIS 160-197153/4)

A matrix spike/matrix spike duplicate (MS/MSD) was not performed with batch 160-197153;The associated samples were all analyzed at a dilution. The associated laboratory control samples (LCS/LCSD) were performed to demonstrate accuracy and precision; both met acceptance criteria.

A Tentatively Identified Compound (TIC) search was performed on the sample for the following compounds; Dimethyl sulfide, dimethyl disulfide and dimethyl sulfoxide.

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

Organic Prep
Method 8270
batch 196049

Job ID: 160-12349-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

Sample smelled strongly and reacted to the acid. It took about 30x the amount of acid normally used to make acidic, and about 4x as much base.

Method(s)
8151A, 8270, 8151, 8081
The sample had a very strong odor. It had a very strong chemical reaction when the PH was adjusted. The BNAs were allowed to sit for 60mins in order for the chemical reaction to cease.

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

TCLP SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)
Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for TCLP semivolatile organic compounds (GC-MS) in accordance with EPA SW-846 Methods 1311 / 8270D. The samples were leached on 06/18/2015, prepared on 06/25/2015 and analyzed on 06/29/2015.

Analytical Batch 197753
The following sample was diluted to bring the concentration of target analytes within the calibration range: SCRUBBER TEST 6-16 (160-12349-1). Surrogates were diluted out. Elevated reporting limits (RLs) are provided.

The following sample required a dilution due to the nature of the sample matrix: SCRUBBER TEST 6-16 (160-12349-1). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision were outside control limits. Sample matrix interference is suspected.

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

SEMIVOLATILE ORGANIC COMPOUNDS (GC MS)
Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for semivolatile organic compounds (GC MS) in accordance with EPA SW-846 Method 8270D. The samples were prepared on 06/18/2015 and analyzed on 06/29/2015.

Analytical Batch 196110
The following samples were diluted due to the nature of the sample matrix: SCRUBBER TEST 6-16 (160-12349-1), (160-12349-H-1-N MS) and (160-12349-H-1-O MSD). Elevated reporting limits (RLs) are provided.

The laboratory control sample (LCS) recovered outside control limits for the following analytes: 4-Chloroaniline and 4-Nitrophenol. These analytes were biased high in the LCS and were not detected in the associated sample; therefore, the data have been reported. (LCS 160-196049/2-A)

Six surrogates are used for this analysis. One acid and one base of these surrogates is allowed to be outside acceptance criteria without performing re-extraction/re-analysis. The following samples contained an allowable number of surrogate compounds outside limits: (160-12274-I-1-A MS) and (160-12274-J-1-A MSD). These results have been reported and qualified.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) was within acceptance limits.

Analytical Batch 197753
The following sample was diluted to bring the concentration of target analytes within the calibration range: SCRUBBER TEST 6-16 (160-12349-1). Surrogates were diluted out. Elevated reporting limits (RLs) are provided.

Surrogate recovery for the following samples was outside control limits: SCRUBBER TEST 6-16 (160-12349-1), (160-12349-H-1-N MS) and (160-12349-H-1-O MSD). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

The following sample required a dilution due to the nature of the sample matrix: SCRUBBER TEST 6-16 (160-12349-1). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful

Job ID: 160-12349-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

information.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision were outside control limits. Sample matrix interference is suspected.

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

TCLP CHLORINATED PESTICIDES

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for TCLP chlorinated pesticides in accordance with EPA SW-846 Methods 1311/ 8081B. The samples were leached on 06/18/2015, prepared on 06/25/2015 and analyzed on 06/27/2015.

The laboratory control sample (LCS) and matrix spike duplicate (MSD) recovered outside control limits for the following analytes: Endrin, gamma-BHC (Lindane) and Heptachlor epoxide. The matrix spike (MS) recovered outside control limits for the following analyte: gamma-BHC (Lindane) These analytes were biased high in the LCS, MS, and MSD and were not detected above the RL the associated samples; therefore, the data have been reported. The MS/MSD RPD for Methoxychlor is also outside QC limits.

Tetrachloro-m-xylene surrogate recovery for the following samples was outside control limits: SCRUBBER TEST 6-16 (160-12349-1). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

The %RPD between the primary and confirmation column exceeded 40% for Heptachlor for the following sample: SCRUBBER TEST 6-16 (160-12349-1). The lower value has been reported and qualified in accordance with the laboratory's SOP.

Analyst notice days later after running a multitude of samples that the Toxaphene curve in 160-197511 on the B colum only, was missing 2 levels for only peak #4 of Toxaphene. Due to this excursion, Toxaphene will be reported from the A column only. Any sample that needs Toxaphene reported from the B column will be re-analyzed with a new calibration. Analyst will perform a new calibration when current run (06/30/15) is finished and before new samples are analyzed. This excursion has no adverse affect on the data presented and issue was discussed with the QA Manager. (ICRT 160-197511/7)

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

TCLP CHLORINATED HERBICIDES

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for TCLP chlorinated herbicides in accordance with SW- 846 Method 9315. The samples were leached on 06/18/2015, prepared on 06/25/2015 and analyzed on 06/29/2015.

Surrogate recovery for the following sample was outside the upper control limit: SCRUBBER TEST 6-16 (160-12349-1). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following samples was outside control limits: (160-12404-G-1-H MS) and (160-12404-G-1-I MSD). Evidence of matrix interference is present and confirmed by the MS/MSD; therefore, re-extraction and/or re-analysis was not performed.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the recoveries and precision was within acceptance limits on the confirmation column.

The CCV recoveries are outside the upper QC limits of 20%D on the confirmation column for 2,4-D. The CCV recoveries on the primary column are acceptable; therefore the sample data will be reported with this narrative.

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

TCLP METALS (ICP)

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for TCLP metals (ICP) in accordance with EPA SW-846 Method 1311/6010C. The samples were leached on 06/18/2015, prepared on 06/19/2015 and analyzed on 06/22/2015.

Analytical Batch 196829

The following samples from preparation batch 160-196046 and 160-196390 and analytical batch 160-196829 were diluted due to the nature of the sample matrix. The samples were high in salts, which cause internal standard and QC failures when the samples are run at

Job ID: 160-12349-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

a lesser dilution: SCRUBBER TEST 6-16 (160-12349-1), (160-12349-H-1-J MS), (160-12349-H-1-K MSD). Elevated reporting limits (RLs) are provided.

Selenium was detected in method blank LB 160-196046/1-D at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged.

The matrix spike / matrix spike duplicate (MS/MSD) from preparation batch 160-196046 and 160-196390 and analytical batch 160-196829 had a recovery and precision for barium that was outside control limits, indicating a matrix interference. The LCS was within acceptable limits.

The matrix spike and/or matrix spike duplicate (MS/MSD) recoveries for preparation batch 160-196046 and 160-196390 and analytical batch 160-196829 were outside control limits for silver and chromium. 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.

TOTAL METALS (ICP)

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for total metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 06/19/2015 and analyzed on 06/23/2015 and 06/25/2015.

Analytical Batch 197062

The following samples from were diluted to bring the concentration of target analytes within the calibration range: SCRUBBER TEST 6-16 (160-12349-1), (160-12251-F-1-B MS), (160-12251-F-1-C MSD). Elevated reporting limits (RLs) are provided

Arsenic was detected in method blank MB 160-196383/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged.

The instrument blank for contained manganese and iron greater than the reporting limit (RL) but were not reanalyzed because the bracketing CCB recovered below the RL indicating that no bias was present during analysis of the samples. (ICB 160-197062/6)

Due to the high concentration of calcium, magnesium, sodium, and sulfur, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 160-196383 and analytical batch 160-197062 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 160-196383 and analytical batch 160-197062 were outside control limits for potassium. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

The serial dilution performed for the following sample from preparation batch 160-196383 and analytical batch 160-197062 was outside control limits for magnesium, sodium, and sulfur, indicating a matrix interference: (160-12251-F-1-A SD).

The low level continuing calibration verification (CCVL) associated with prep batch 196383 and analytical batch 160-197062 recovered above the upper control limit for iron. The samples associated with this CCVL were non-detects for the affected analytes; therefore, the data have been reported. (CCVL 160-197062/40)

Analytical Batch 197326

The following sample was diluted due to the nature of the sample matrix. The samples were high in salts, which cause internal standard and QC failures when the samples are run at a lesser dilution: SCRUBBER TEST 6-16 (160-12349-1). Elevated reporting limits (RLs) are provided.

Due to the high concentration of Strontium, the matrix spike / matrix spike duplicate (MS/MSD) could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

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

Job ID: 160-12349-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

TCLP MERCURY
Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for TCLP mercury in accordance with EPA SW-846 Methods 1311/7470A. The samples were leached on 06/18/2015, and prepared and analyzed on 06/19/2015.

Potassium Permanganate settled to bottom of digestion tube during digestion. Sample maintained potassium Permanganate for 30 minutes prior to digestion. Minimal agitation returned the Potassium Permanganate into suspension in the solution.

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

TOTAL MERCURY
Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 06/19/2015.

The following sample was diluted due to the nature of the sample matrix: SCRUBBER TEST 6-16 (160-12349-1). The samples were high in organic solids, which cause the Potassium Permanganate to be reduced prior to digestion. Elevated reporting limits (RLs) are provided.

Potassium Permanganate settled to bottom of digestion tube during digestion. Sample maintained potassium Permanganate for 30 minutes prior to digestion. Minimal agitation returned the Potassium Permanganate into suspension in the solution.

The following sample was diluted to bring the concentration of target analytes within the calibration range: SCRUBBER TEST 6-16 (160-12349-1). Elevated reporting limits (RLs) are provided.

The serial dilution performed for the following sample associated with batch 160-196521 was outside control limits: (160-12355-G-7-A SD).

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

1664A
Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for 1664A in accordance with EPA Method 1664A. The samples were prepared and analyzed on 06/24/2015.

Sample SCRUBBER TEST 6-16 (160-12349-1) reacted violently to HCL. Sample(s) was not able to be preserved to a Ph of <2.

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

ALKALINITY
Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 06/19/2015.

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

TOTAL DISSOLVED SOLIDS
Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for total dissolved solids in accordance with SM 2540C. The samples were analyzed on 06/27/2015.

The following sample was analyzed outside of analytical holding time: SCRUBBER TEST 6-16 (160-12349-1).

The minimum analysis volume of 1 mL was used for the following sample which produced a base result greater than 200mg before calculation of the final result: SCRUBBER TEST 6-16 (160-12349-1). The reference method specifies that no more than 200mg of weight be recovered for a chosen sample analysis volume in order to produce the best data precision. As such, the data has been qualified.

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

TOTAL SUSPENDED SOLIDS

Job ID: 160-12349-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for total suspended solids in accordance with SM 2540D. The samples were analyzed on 07/01/2015.

Total Suspended Solids exceeded the RPD limit for the duplicate of sample SCRUBBER TEST 6-16DU (160-12349-1). 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.

ANIONS, ION CHROMATOGRAPHY

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for Anions, Ion Chromatography in accordance with EPA Method 300.0. The samples were analyzed on 06/18/2015 and 06/19/2015.

Analytical Batch 196113

The following sample was diluted to bring the concentrations of target analytes within the calibration range: SCRUBBER TEST 6-16 (160-12349-1). Elevated reporting limits (RLs) are provided.

Analytical Batch 196114

The following sample was analyzed at dilution to start, based on high sample conductivity which made undiluted analysis inadvisable: SCRUBBER TEST 6-16 (160-12349-1). Further dilutions were then required to resolve matrix interference at the Nitrate and Nitrite retention times. As a result, these anions are reported non-detect (ND) at dilution.

The matrix spike (MS) performed on the following sample was outside recovery limits for Nitrite (81%) in Anion batch 196114: (160-12355-A-4 MS). Sample matrix interference is suspected, because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Analytical Batch 196118

The following sample was diluted to bring the concentrations of the target analytes within the calibration range in Anion batch 196118: SCRUBBER TEST 6-16 (160-12349-1). Elevated reporting limits (RLs) are provided.

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

TOTAL CYANIDE

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for total cyanide in accordance with EPA Method 335.4. The samples were prepared on 06/24/2015 and analyzed on 06/25/2015.

The matrix spike (MS) recovery was outside control limits. Sample matrix interference and/or non-homogeneity are 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.

AMMONIA

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for ammonia in accordance with EPA Method 350.2. The samples were prepared on 06/19/2015 and analyzed on 06/22/2015.

The following sample was distilled at a reduced volume due to matrix: SCRUBBER TEST 6-16 (160-12349-1). Elevated reporting limits (RLs) are provided.

Due to the high concentration of Ammonia (as N), the matrix spike / matrix spike duplicate (MS/MSD) could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

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

TOTAL KJELDAHL NITROGEN

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for total kjeldahl nitrogen in accordance with EPA Method 351.2. The samples were prepared on 06/23/2015 and analyzed on 06/24/2015.

Job ID: 160-12349-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

The following sample was digested at a reduced volume due to matrix: SCRUBBER TEST 6-16 (160-12349-1). Elevated reporting limits (RLs) are provided.

Kjeldahl Nitrogen as N was detected in method blank MB 490-258815/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

The continuing calibration blank contained Total Kjeldahl Nitrogen above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries were outside control limits. Sample matrix interference and/or non-homogeneity are 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.

TOTAL PHOSPHORUS

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for total phosphorus in accordance with EPA Method 365.4. The samples were prepared on 06/26/2015 and analyzed on 06/28/2015.

The following sample was digested at a reduced volume due to sample matrix: SCRUBBER TEST 6-16 (160-12349-1). Elevated reporting limits (RLs) are provided.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision were outside control limits.

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

TOTAL RESIDUAL CHLORINE

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for total residual chlorine in accordance with SM 4500_CL_G. The samples were analyzed on 06/29/2015.

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

CHEMICAL OXYGEN DEMAND

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for chemical oxygen demand in accordance with SM 5220D. The samples were analyzed on 06/19/2015.

Chemical Oxygen Demand was detected in method blank MB 490-257786/3 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Sample SCRUBBER TEST 6-16 (160-12349-1)[100X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Method(s) SM 5220D: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 490-257786 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

The method blank and continuing calibration blank for analytical batch 490-257786 contained above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

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

PH

Job ID: 160-12349-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for pH in accordance with SM 4500 H+ B. The samples were analyzed on 06/19/2015.

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

SULFIDE
Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for sulfide in accordance with SM 4500 S2 E. The samples were analyzed on 06/21/2015 and 06/23/2015.

Total Sulfide failed the recovery criteria high for the MS of sample SCRUBBER TEST 6-16MS (160-12349-1) in batch 490-258105.

The matrix spike duplicate (MSD) recovery for analytical batch 490-258769 was outside control limits for Sulfide, Dissolved. Non-homogeneity 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.

SULFITE
Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for sulfite in accordance with SM 4500 SO3 B. The samples were analyzed on 06/28/2015.

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

BIOCHEMICAL OXYGEN DEMAND
Sample SCRUBBER TEST 6-16 (160-12349-1) was analyzed for Biochemical Oxygen Demand in accordance with SM 5210B. The samples were analyzed on 06/18/2015.

Sample SCRUBBER TEST 6-16 (160-12349-1)[100X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The USB dilution water D.O. depletion was greater than 0.2 mg/L but less than the reporting limit of 2.0 mg/L. The associated sample results in batch 490-258518 are reported.

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

General Chemistry
Method(s) 1311: This sample in batch# 196046 is organic and reacts badly when acid is added: SCRUBBER TEST 6-16 (160-12349-1).

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

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	Lab PM: Franks, Michael C	Carrier Tracking No(s):	COC No: 160-2859-1351.1
Client Contact: Mr. Derek Bouchard	Phone:	E-Mail: mike.franks@testamericainc.com		Page: Page 1 of 2
Company: Bridgeton Landfill, LLC				Job #:
Address: 13570 St. Charles Rock Road	Due Date Requested:			
City: Bridgeton	TAT Requested (days):			
State, Zip: MO, 63044				
Phone: 314-656-2114(Tel)	PO #: Purchase Order Requested			
Email: dbouchard@republicservices.com	WO #:			
Project Name: Bridgeton Landfill - Scrubber Water	Project #: 16004340			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300_ORGFM_28D, 300_ORGFMS	6010C, 7470A	8260C - (MOD) OLM 4.2	8270D - OLM 4.2	350.1, 351.2, 365.4, 5220D	2320B, 4500_CL_G, SM4500_H+	1664A - Fats, Oils or Grease	2540D, SM6210B_BODCalc	2540C_Calcd - Total Dissolved Solids	SM4500_S2_F - Total Sulfide	335.4 - Cyanide, Total	SM4500SO3_B - Sulfite	8260C - RCRA list	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	A	N	S	N	A	N	N	CB	B	K	N		
Scrubber Test 6-16	6/16/2015	8pm	C	W			X	X	X	X	X	X	X	X	X	X	X	X	X	22	

160-12349 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:				
Relinquished by:	Date/Time: 6/17/15 750am	Company CEC	Received by:	Date/Time: 6-17-15 1050	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	Lab PM: Franks, Michael C	Carrier Tracking No(s):	COC No: 160-2859-1351.2
Client Contact: Mr. Derek Bouchard	Phone:	E-Mail: mike.franks@testamericainc.com		Page: Page 2 of 2
Company: Bridgeton Landfill, LLC				Job #:
Address: 13570 St. Charles Rock Road	Due Date Requested:			
City: Bridgeton	TAT Requested (days):			
State, Zip: MO, 63044				
Phone: 314-656-2114(Tel)	PO #: Purchase Order Requested			
Email: dbouchard@republicservices.com	WO #:			
Project Name: Bridgeton Landfill - Scrubber Water	Project #: 16004340			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C, 7470A	8081B, 8151A, 8270D	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N		
Scrubber Test 6-16	6/16/2015	8pm	C	W			X	X	4	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time	Company		Date/Time	Company
Relinquished by:	6/17/15 750am	CEC	Received by:	6-17-15 1050	TA St Louis
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

7/6/2015

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gish, Erika K	Carrier Tracking No(s):	COC No: 160-57003.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: erika.gish@testamericainc.com		Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc				Job #: 160-12349-1

Address: 2960 Foster Creighton Drive,	Due Date Requested: 6/29/2015
City: Nashville	TAT Requested (days):
State, Zip: TN, 37204	
Phone: 615-726-0177(Tel) 615-726-3404(Fax)	PO #:
Email:	WO #:
Project Name: Bridgeton Landfill - Scrubber Water	Project #: 16004340
Site:	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	4500_CL_G/ Total Residual Chlorine	6220D/ Chemical Oxygen Demand (COD)	SM4500_H+/ pH	SM4500_S2_F/ Total Sulfide	SM4500_S2_F/ Dissolved Sulfide	SM4500SO3_B/ Sulfite	SM5210B_BODCalc/ Biochemical Oxygen Demand (BOD 5-Day)	2320B/ (MOD) Alkalinity as CaCO3 (Total, Carbon	2540C_Calcd/ Total Dissolved Solids	2540D/ Total Suspended Solids	335.4/Distill_CN Total Cyanide	350.1/Distill_Ammonia (MOD) Copy Analytes	351.2/351.2_Prep Total Kjeldahl Nitrogen	Total Number of containers	Special Instructions/Note:
			Preservation Code:																		
SCRUBBER TEST 6-16 (160-12349-1)	6/16/15	20:00 Central		Water			X	X	X	X	X	X	X	X	X	X	X	X	X	11	

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Gil Clarke	6-17-15 1700	TAST	[illegible] TAN 2.1	06/18/15 0830	TAN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.1

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

Loc: 160
12349

COOLER RECEIPT FORM

Cooler Received/Opened On 6/18/2015 @ 0830

1. Tracking # 0657 (last 4 digits, FedEx)

Courier: Fed-ex IR Gun ID 17960357

2. Temperature of rep. sample or temp blank when opened: 2.1 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: _____

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) _____

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES..NO..NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) _____

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) _____

I certify that I attached a label with the unique LIMS number to each container (intial) _____

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 11/28/12

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 160-12349-1

Login Number: 12349
List Number: 1
Creator: Daniels, Brian J

List Source: TestAmerica St. Louis

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
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?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	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	Preservative was added to samples.
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").	False	2 of 3 VOA vials had headspace. One vial remains for analysis.
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 160-12349-1

Login Number: 12349
List Number: 2
Creator: Gambill, Shane

List Source: TestAmerica Nashville
List Creation: 06/18/15 11:42 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
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	2.1
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.	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	

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

GC/MS Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate is outside control limits
F2	MS/MSD RPD exceeds control limits
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution may be flagged with a D.
*	LCS or LCSD is outside acceptance limits.

GC Semi VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.
X	Surrogate is outside control limits
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F1	MS and/or MSD Recovery is outside acceptance limits.

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
B	Compound was found in the blank and sample.
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.
b	Result Detected in the Unseeded Control blank (USB).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
E	Result exceeded calibration range.
H	Sample was prepped or analyzed beyond the specified holding time
F3	Duplicate RPD exceeds the control limit
F2	MS/MSD RPD exceeds control 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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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)

Method Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - Scrubber Water

TestAmerica Job ID: 160-12349-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL SL
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL SL
8081B	Organochlorine Pesticides (GC)	SW846	TAL SL
8151A	Herbicides (GC)	SW846	TAL SL
300.0	Anions, Ion Chromatography	MCAWW	TAL SL
6010C	Metals (ICP)	SW846	TAL SL
7470A	Mercury (CVAA)	SW846	TAL SL
1664A	HEM and SGT-HEM	1664A	TAL NSH
335.4	Cyanide, Total	MCAWW	TAL NSH
350.1	Nitrogen, Ammonia	MCAWW	TAL NSH
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL NSH
365.4	Phosphorus, Total	EPA	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL NSH
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL NSH
SM 4500 Cl G	Chlorine, Residual	SM	TAL NSH
SM 4500 H+ B	pH	SM	TAL NSH
SM 4500 S2 F	Sulfide, Total	SM	TAL NSH
SM 4500 SO3 B	Sulfite	SM	TAL NSH
SM 5220D	COD	SM	TAL NSH
SM5210B	BOD, 5 Day	SM	TAL NSH

Protocol References:

1664A = EPA-821-98-002
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
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 NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177
TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - Scrubber Water

TestAmerica Job ID: 160-12349-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-12349-1	SCRUBBER TEST 6-16	Water	06/16/15 20:00	06/17/15 07:50

Detection Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - Scrubber Water

TestAmerica Job ID: 160-12349-1

Client Sample ID: SCRUBBER TEST 6-16

Lab Sample ID: 160-12349-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene - DL	7.8	J	50	4.0	ug/L	10		8260C	Total/NA
1,4-Dichlorobenzene - DL	20	J	50	3.5	ug/L	10		8260C	Total/NA
4-Isopropyltoluene - DL	15	J	50	3.2	ug/L	10		8260C	Total/NA
4-Methyl-2-pentanone (MIBK) - DL	330		200	3.3	ug/L	10		8260C	Total/NA
Benzene - DL	210		50	2.5	ug/L	10		8260C	Total/NA
Carbon disulfide - DL	120		50	3.7	ug/L	10		8260C	Total/NA
Chloroform - DL	260		50	1.5	ug/L	10		8260C	Total/NA
m-Xylene & p-Xylene - DL	15	J	50	5.7	ug/L	10		8260C	Total/NA
o-Xylene - DL	9.7	J	50	3.2	ug/L	10		8260C	Total/NA
Tetrachloroethene - DL	37	J	50	2.8	ug/L	10		8260C	Total/NA
Toluene - DL	26	J	50	10	ug/L	10		8260C	Total/NA
Xylenes, Total - DL	25	J	100	8.5	ug/L	10		8260C	Total/NA
2-Butanone (MEK) - DL2	55000		40000	780	ug/L	2000		8260C	Total/NA
Acetone - DL2	150000		40000	13000	ug/L	2000		8260C	Total/NA
Methyl acetate - DL2	10000	J	50000	4600	ug/L	2000		8260C	Total/NA
2-Butanone (MEK)	34		2.5	0.19	mg/L	50		8260C	TCLP
Benzene	0.058		0.050	0.0025	mg/L	1		8260C	TCLP
Chloroform	0.14		0.050	0.00092	mg/L	1		8260C	TCLP
Tetrachloroethene	0.0045	J	0.050	0.0028	mg/L	1		8260C	TCLP
1,4-Dichlorobenzene	65	J	160	16	ug/L	20		8270D	Total/NA
2-Methylnaphthalene	25	J	160	16	ug/L	20		8270D	Total/NA
3 & 4 Methylphenol	410		320	32	ug/L	20		8270D	Total/NA
Naphthalene	90	J	160	16	ug/L	20		8270D	Total/NA
Phenol	620		160	32	ug/L	20		8270D	Total/NA
1,4-Dioxane - DL	4700		410	41	ug/L	50		8270D	Total/NA
3 & 4 Methylphenol	0.44	J	0.50	0.025	mg/L	5		8270D	TCLP
Endrin	0.00016	J p *	0.00050	0.000050	mg/L	1		8081B	TCLP
Sulfate - DL	100		10	1.0	mg/L	20		300.0	Total/NA
Chloride - RADL	130000		10000	1000	mg/L	50000		300.0	Total/NA
Chromium	30000		25000	8400	ug/L	500		6010C	Total/NA
Copper	6300	J	63000	5300	ug/L	500		6010C	Total/NA
Iron	75000	J ^	250000	32000	ug/L	500		6010C	Total/NA
Nickel	11000	J	100000	6400	ug/L	500		6010C	Total/NA
Silver	3000	J	25000	2500	ug/L	500		6010C	Total/NA
Sodium	88000000		2500000	260000	ug/L	500		6010C	Total/NA
Zinc	21000	J	50000	21000	ug/L	500		6010C	Total/NA
Cadmium	0.088	J	0.63	0.042	mg/L	50		6010C	TCLP
Chromium	4.9	F1	1.3	0.42	mg/L	50		6010C	TCLP
Lead	0.088	J	13	0.075	mg/L	50		6010C	TCLP
Selenium	0.39	J B	25	0.26	mg/L	50		6010C	TCLP
Mercury	150		10	3.0	ug/L	10		7470A	Total/NA
Mercury	0.0033		0.0010	0.000079	mg/L	1		7470A	TCLP
Fats, Oils or Grease	8.5		3.8	1.3	mg/L	1		1664A	Total/NA
Ammonia	3.0		1.0	0.60	mg/L	1		350.1	Total/NA
Kjeldahl Nitrogen as N	1.3	J B	5.0	1.2	mg/L	1		351.2	Total/NA
Total Dissolved Solids	300000	H E	1000	700	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	930	H	20	14	mg/L	1		SM 2540D	Total/NA
Chlorine, Total Residual	0.42	HF	0.10	0.040	mg/L	1		SM 4500 Cl G	Total/NA
pH	8.68	HF	0.100	0.100	SU	1		SM 4500 H+ B	Total/NA
Sulfide, Dissolved	22	F1	1.0	0.50	mg/L	1		SM 4500 S2 F	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - Scrubber Water

TestAmerica Job ID: 160-12349-1

Client Sample ID: SCRUBBER TEST 6-16 (Continued)

Lab Sample ID: 160-12349-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Sulfide	43	F1	1.0	0.50	mg/L	1		SM 4500 S2 F	Total/NA
Sulfite	31	HF	5.0	2.5	mg/L	1		SM 4500 SO3 B	Total/NA
Chemical Oxygen Demand	6000	B	2000	400	mg/L	100		SM 5220D	Total/NA
Biochemical Oxygen Demand	6800	b	6000	6000	mg/L	100		SM5210B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: SCRUBBER TEST 6-16
Date Collected: 06/16/15 20:00
Date Received: 06/17/15 07:50

Lab Sample ID: 160-12349-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		50	2.5	ug/L			06/24/15 22:36	10
1,1,1-Trichloroethane	ND		50	2.9	ug/L			06/24/15 22:36	10
1,1,2,2-Tetrachloroethane	ND		50	4.3	ug/L			06/24/15 22:36	10
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		50	2.5	ug/L			06/24/15 22:36	10
1,1,2-Trichloroethane	ND		50	5.7	ug/L			06/24/15 22:36	10
1,1-Dichloroethane	ND		50	3.9	ug/L			06/24/15 22:36	10
1,1-Dichloroethene	ND		50	3.7	ug/L			06/24/15 22:36	10
1,1-Dichloropropene	ND		50	3.0	ug/L			06/24/15 22:36	10
1,2,3-Trichlorobenzene	ND		50	6.5	ug/L			06/24/15 22:36	10
1,2,3-Trichloropropane	ND		50	5.6	ug/L			06/24/15 22:36	10
1,2,4-Trichlorobenzene	ND		50	5.5	ug/L			06/24/15 22:36	10
1,2,4-Trimethylbenzene	**7.8**	**J**	50	4.0	ug/L			06/24/15 22:36	10
1,2-Dibromo-3-Chloropropane	ND		100	12	ug/L			06/24/15 22:36	10
1,2-Dibromoethane (EDB)	ND		50	4.4	ug/L			06/24/15 22:36	10
1,2-Dichlorobenzene	ND		50	2.8	ug/L			06/24/15 22:36	10
1,2-Dichloroethane	ND		50	3.7	ug/L			06/24/15 22:36	10
1,2-Dichloropropane	ND		50	3.2	ug/L			06/24/15 22:36	10
1,3,5-Trichlorobenzene	ND		50	5.1	ug/L			06/24/15 22:36	10
1,3,5-Trimethylbenzene	ND		50	2.8	ug/L			06/24/15 22:36	10
1,3-Dichlorobenzene	ND		50	2.3	ug/L			06/24/15 22:36	10
1,3-Dichloropropane	ND		50	2.4	ug/L			06/24/15 22:36	10
1,4-Dichlorobenzene	**20**	**J**	50	3.5	ug/L			06/24/15 22:36	10
2,2-Dichloropropane	ND		50	5.4	ug/L			06/24/15 22:36	10
2-Chlorotoluene	ND		50	3.4	ug/L			06/24/15 22:36	10
2-Hexanone	ND		200	5.9	ug/L			06/24/15 22:36	10
4-Chlorotoluene	ND		50	3.1	ug/L			06/24/15 22:36	10
4-Isopropyltoluene	**15**	**J**	50	3.2	ug/L			06/24/15 22:36	10
4-Methyl-2-pentanone (MIBK)	**330**		200	3.3	ug/L			06/24/15 22:36	10
Acrylonitrile	ND		500	17	ug/L			06/24/15 22:36	10
Benzene	**210**		50	2.5	ug/L			06/24/15 22:36	10
Bromochloromethane	ND		50	5.5	ug/L			06/24/15 22:36	10
Bromodichloromethane	ND		50	2.5	ug/L			06/24/15 22:36	10
Bromoform	ND		50	3.7	ug/L			06/24/15 22:36	10
Bromomethane	ND		100	4.0	ug/L			06/24/15 22:36	10
Carbon disulfide	**120**		50	3.7	ug/L			06/24/15 22:36	10
Carbon tetrachloride	ND		50	3.6	ug/L			06/24/15 22:36	10
Chlorobenzene	ND		50	3.8	ug/L			06/24/15 22:36	10
Chloroethane	ND		100	3.8	ug/L			06/24/15 22:36	10
Chloroform	**260**		50	1.5	ug/L			06/24/15 22:36	10
Chloromethane	ND		100	5.5	ug/L			06/24/15 22:36	10
cis-1,2-Dichloroethene	ND		50	1.6	ug/L			06/24/15 22:36	10
cis-1,3-Dichloropropene	ND		50	3.4	ug/L			06/24/15 22:36	10
Cyclohexane	ND		100	3.6	ug/L			06/24/15 22:36	10
Dibromochloromethane	ND		50	3.3	ug/L			06/24/15 22:36	10
Dibromomethane	ND		50	4.1	ug/L			06/24/15 22:36	10
Dichlorodifluoromethane	ND		100	4.5	ug/L			06/24/15 22:36	10
Ethylbenzene	ND		50	3.0	ug/L			06/24/15 22:36	10
Isopropylbenzene	ND		50	2.6	ug/L			06/24/15 22:36	10
Methyl tert-butyl ether	ND		50	4.0	ug/L			06/24/15 22:36	10

Client Sample ID: SCRUBBER TEST 6-16

Date Collected: 06/16/15 20:00
Date Received: 06/17/15 07:50

Lab Sample ID: 160-12349-1

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS - DL (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	ND		100	2.6	ug/L			06/24/15 22:36	10
Methylene Chloride	ND		50	17	ug/L			06/24/15 22:36	10
m-Xylene & p-Xylene	**15**	**J**	50	5.7	ug/L			06/24/15 22:36	10
n-Butylbenzene	ND		50	2.3	ug/L			06/24/15 22:36	10
N-Propylbenzene	ND		50	3.0	ug/L			06/24/15 22:36	10
o-Xylene	**9.7**	**J**	50	3.2	ug/L			06/24/15 22:36	10
sec-Butylbenzene	ND		50	3.1	ug/L			06/24/15 22:36	10
Styrene	ND		50	3.5	ug/L			06/24/15 22:36	10
tert-Butylbenzene	ND		50	3.1	ug/L			06/24/15 22:36	10
Tetrachloroethene	**37**	**J**	50	2.8	ug/L			06/24/15 22:36	10
Toluene	**26**	**J**	50	10	ug/L			06/24/15 22:36	10
trans-1,2-Dichloroethene	ND		50	1.8	ug/L			06/24/15 22:36	10
trans-1,3-Dichloropropene	ND		50	3.5	ug/L			06/24/15 22:36	10
Trichloroethene	ND		50	2.9	ug/L			06/24/15 22:36	10
Trichlorofluoromethane	ND		50	2.2	ug/L			06/24/15 22:36	10
Vinyl chloride	ND		50	4.3	ug/L			06/24/15 22:36	10
Xylenes, Total	**25**	**J**	100	8.5	ug/L			06/24/15 22:36	10

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Dimethyl sulfide	*1400*	*T J N*	*ug/L*		*3.84*	*75-18-3*		*06/24/15 22:36*	*10*
Disulfide, dimethyl	*360*	*T J N*	*ug/L*		*10.04*	*624-92-0*		*06/24/15 22:36*	*10*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*78 - 127*		*06/24/15 22:36*	*10*
4-Bromofluorobenzene (Surr)	*100*		*75 - 123*		*06/24/15 22:36*	*10*
Dibromofluoromethane (Surr)	*110*		*80 - 120*		*06/24/15 22:36*	*10*
Toluene-d8 (Surr)	*100*		*80 - 120*		*06/24/15 22:36*	*10*

Method: 8260C - Volatile Organic Compounds by GC/MS - DL2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone (MEK)	**55000**		40000	780	ug/L			06/25/15 00:16	2000
Acetone	**150000**		40000	13000	ug/L			06/25/15 00:16	2000
Methyl acetate	**10000**	**J**	50000	4600	ug/L			06/25/15 00:16	2000

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*06/25/15 00:16*	*2000*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*78 - 127*		*06/25/15 00:16*	*2000*
4-Bromofluorobenzene (Surr)	*95*		*75 - 123*		*06/25/15 00:16*	*2000*
Dibromofluoromethane (Surr)	*106*		*80 - 120*		*06/25/15 00:16*	*2000*
Toluene-d8 (Surr)	*96*		*80 - 120*		*06/25/15 00:16*	*2000*

Method: 8260C - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.050	0.0037	mg/L			06/18/15 12:57	1
1,2-Dichloroethane	ND		0.050	0.0037	mg/L			06/18/15 12:57	1
2-Butanone (MEK)	**34**		2.5	0.19	mg/L			06/19/15 10:09	50
Benzene	**0.058**		0.050	0.0025	mg/L			06/18/15 12:57	1
Carbon tetrachloride	ND		0.050	0.0036	mg/L			06/18/15 12:57	1
Chlorobenzene	ND		0.050	0.0038	mg/L			06/18/15 12:57	1

Client Sample ID: SCRUBBER TEST 6-16
Date Collected: 06/16/15 20:00
Date Received: 06/17/15 07:50

Lab Sample ID: 160-12349-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS - TCLP (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroform	**0.14**		0.050	0.00092	mg/L			06/18/15 12:57	1
Tetrachloroethene	**0.0045**	**J**	0.050	0.0028	mg/L			06/18/15 12:57	1
Trichloroethene	ND		0.050	0.0029	mg/L			06/18/15 12:57	1
Vinyl chloride	ND		0.10	0.0043	mg/L			06/18/15 12:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*84 - 120*		*06/18/15 12:57*	*1*
4-Bromofluorobenzene (Surr)	*94*		*84 - 120*		*06/19/15 10:09*	*50*
1,2-Dichloroethane-d4 (Surr)	*107*		*83 - 117*		*06/18/15 12:57*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*83 - 117*		*06/19/15 10:09*	*50*
Toluene-d8 (Surr)	*101*		*85 - 115*		*06/18/15 12:57*	*1*
Toluene-d8 (Surr)	*100*		*85 - 115*		*06/19/15 10:09*	*50*
Dibromofluoromethane (Surr)	*108*		*85 - 115*		*06/18/15 12:57*	*1*
Dibromofluoromethane (Surr)	*112*		*85 - 115*		*06/19/15 10:09*	*50*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
1,2-Dichlorobenzene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
1,3-Dichlorobenzene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
1,4-Dichlorobenzene	**65**	**J**	160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
2,4,5-Trichlorophenol	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
2,4,6-Trichlorophenol	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
2,4-Dichlorophenol	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
2,4-Dimethylphenol	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
2,4-Dinitrophenol	ND		810	32	ug/L		06/18/15 11:02	06/29/15 20:08	20
2,4-Dinitrotoluene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
2,6-Dinitrotoluene	ND		160	35	ug/L		06/18/15 11:02	06/29/15 20:08	20
2-Chloronaphthalene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
2-Chlorophenol	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
2-Methylnaphthalene	**25**	**J**	160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
2-Methylphenol	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
2-Nitroaniline	ND		160	18	ug/L		06/18/15 11:02	06/29/15 20:08	20
2-Nitrophenol	ND		160	25	ug/L		06/18/15 11:02	06/29/15 20:08	20
3 & 4 Methylphenol	**410**		320	32	ug/L		06/18/15 11:02	06/29/15 20:08	20
3,3'-Dichlorobenzidine	ND		810	21	ug/L		06/18/15 11:02	06/29/15 20:08	20
3-Nitroaniline	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
4,6-Dinitro-2-methylphenol	ND		160	20	ug/L		06/18/15 11:02	06/29/15 20:08	20
4-Bromophenyl phenyl ether	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
4-Chloro-3-methylphenol	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
4-Chloroaniline	ND	*	160	32	ug/L		06/18/15 11:02	06/29/15 20:08	20
4-Chlorophenyl phenyl ether	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
4-Nitroaniline	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
4-Nitrophenol	ND	*	160	32	ug/L		06/18/15 11:02	06/29/15 20:08	20
Acenaphthene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Acenaphthylene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Aniline	ND		160	21	ug/L		06/18/15 11:02	06/29/15 20:08	20
Anthracene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Benzo[a]anthracene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Benzo[a]pyrene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20

Client Sample ID: SCRUBBER TEST 6-16

Date Collected: 06/16/15 20:00
Date Received: 06/17/15 07:50

Lab Sample ID: 160-12349-1
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[b]fluoranthene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Benzo[g,h,i]perylene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Benzo[k]fluoranthene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Benzyl alcohol	ND		160	49	ug/L		06/18/15 11:02	06/29/15 20:08	20
bis (2-chloroisopropyl) ether	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Bis(2-chloroethoxy)methane	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Bis(2-chloroethyl)ether	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Bis(2-ethylhexyl) phthalate	ND		160	30	ug/L		06/18/15 11:02	06/29/15 20:08	20
Butyl benzyl phthalate	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Carbazole	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Chrysene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Dibenz(a,h)anthracene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Dibenzofuran	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Diethyl phthalate	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Dimethyl phthalate	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Di-n-butyl phthalate	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Di-n-octyl phthalate	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Diphenylamine	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Fluoranthene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Fluorene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Hexachlorobenzene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Hexachlorobutadiene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Hexachlorocyclopentadiene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Hexachloroethane	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Indeno[1,2,3-cd]pyrene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Isophorone	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Naphthalene	**90**	**J**	160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Nitrobenzene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
N-Nitrosodi-n-propylamine	ND		160	24	ug/L		06/18/15 11:02	06/29/15 20:08	20
Pentachlorophenol	ND		160	21	ug/L		06/18/15 11:02	06/29/15 20:08	20
Phenanthrene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Phenol	**620**		160	32	ug/L		06/18/15 11:02	06/29/15 20:08	20
Pyrene	ND		160	16	ug/L		06/18/15 11:02	06/29/15 20:08	20
Pyridine	ND		320	32	ug/L		06/18/15 11:02	06/29/15 20:08	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*0*	*X D*	*47 - 103*	*06/18/15 11:02*	*06/29/15 20:08*	*20*
2-Fluorobiphenyl (Surr)	*0*	*X D*	*30 - 99*	*06/18/15 11:02*	*06/29/15 20:08*	*20*
2-Fluorophenol (Surr)	*0*	*X D*	*10 - 74*	*06/18/15 11:02*	*06/29/15 20:08*	*20*
Nitrobenzene-d5 (Surr)	*0*	*X D*	*31 - 105*	*06/18/15 11:02*	*06/29/15 20:08*	*20*
Phenol-d5 (Surr)	*0*	*X D*	*10 - 50*	*06/18/15 11:02*	*06/29/15 20:08*	*20*
Terphenyl-d14 (Surr)	*0*	*X D*	*68 - 116*	*06/18/15 11:02*	*06/29/15 20:08*	*20*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**4700**		410	41	ug/L		06/18/15 11:02	06/29/15 19:02	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*0*	*D X*	*47 - 103*	*06/18/15 11:02*	*06/29/15 19:02*	*50*
2-Fluorobiphenyl (Surr)	*0*	*D X*	*30 - 99*	*06/18/15 11:02*	*06/29/15 19:02*	*50*

Client Sample ID: SCRUBBER TEST 6-16

Date Collected: 06/16/15 20:00
Date Received: 06/17/15 07:50

Lab Sample ID: 160-12349-1
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - DL (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorophenol (Surr)	*0*	*D X*	*10 - 74*	*06/18/15 11:02*	*06/29/15 19:02*	*50*
Nitrobenzene-d5 (Surr)	*0*	*D X*	*31 - 105*	*06/18/15 11:02*	*06/29/15 19:02*	*50*
Phenol-d5 (Surr)	*0*	*D X*	*10 - 50*	*06/18/15 11:02*	*06/29/15 19:02*	*50*
Terphenyl-d14 (Surr)	*0*	*D X*	*68 - 116*	*06/18/15 11:02*	*06/29/15 19:02*	*50*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 20:42	5
2,4-Dinitrotoluene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 20:42	5
Hexachlorobenzene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 20:42	5
Hexachlorobutadiene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 20:42	5
Hexachloroethane	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 20:42	5
2-Methylphenol	ND	F2 F1	0.25	0.050	mg/L		06/25/15 15:57	06/29/15 20:42	5
3 & 4 Methylphenol	**0.44**	**J**	0.50	0.025	mg/L		06/25/15 15:57	06/29/15 20:42	5
Nitrobenzene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 20:42	5
Pentachlorophenol	ND		1.3	0.050	mg/L		06/25/15 15:57	06/29/15 20:42	5
Pyridine	ND	F1	0.50	0.13	mg/L		06/25/15 15:57	06/29/15 20:42	5
2,4,5-Trichlorophenol	ND		0.25	0.050	mg/L		06/25/15 15:57	06/29/15 20:42	5
2,4,6-Trichlorophenol	ND		0.25	0.050	mg/L		06/25/15 15:57	06/29/15 20:42	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	*70*		*49 - 100*	*06/25/15 15:57*	*06/29/15 20:42*	*5*
Nitrobenzene-d5 (Surr)	*108*	*X*	*51 - 98*	*06/25/15 15:57*	*06/29/15 20:42*	*5*
Phenol-d5 (Surr)	*43*		*37 - 95*	*06/25/15 15:57*	*06/29/15 20:42*	*5*
Terphenyl-d14 (Surr)	*57*	*X*	*60 - 113*	*06/25/15 15:57*	*06/29/15 20:42*	*5*
2-Fluorobiphenyl (Surr)	*69*		*45 - 94*	*06/25/15 15:57*	*06/29/15 20:42*	*5*
2-Fluorophenol (Surr)	*56*		*46 - 92*	*06/25/15 15:57*	*06/29/15 20:42*	*5*

Method: 8081B - Organochlorine Pesticides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
gamma-BHC (Lindane)	ND	*	0.00050	0.000015	mg/L		06/25/15 14:37	06/27/15 04:39	1
Endrin	**0.00016**	**J p ***	0.00050	0.000050	mg/L		06/25/15 14:37	06/27/15 04:39	1
Heptachlor	ND		0.00050	0.000015	mg/L		06/25/15 14:37	06/27/15 04:39	1
Heptachlor epoxide	ND	*	0.00050	0.000050	mg/L		06/25/15 14:37	06/27/15 04:39	1
Methoxychlor	ND		0.0010	0.000050	mg/L		06/25/15 14:37	06/27/15 04:39	1
Toxaphene	ND		0.020	0.000050	mg/L		06/25/15 14:37	06/27/15 04:39	1
Technical Chlordane	ND		0.0050	0.00020	mg/L		06/25/15 14:37	06/27/15 04:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	*96*		*43 - 131*	*06/25/15 14:37*	*06/27/15 04:39*	*1*
Tetrachloro-m-xylene	*938*	*p X*	*44 - 115*	*06/25/15 14:37*	*06/27/15 04:39*	*1*

Method: 8151A - Herbicides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	ND		0.040	0.020	mg/L		06/25/15 16:06	06/29/15 10:45	1
Silvex (2,4,5-TP)	ND		0.010	0.0030	mg/L		06/25/15 16:06	06/29/15 10:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	*1462*	*X*	*56 - 147*	*06/25/15 16:06*	*06/29/15 10:45*	*1*

Client Sample ID: SCRUBBER TEST 6-16
Date Collected: 06/16/15 20:00
Date Received: 06/17/15 07:50

Lab Sample ID: 160-12349-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**100**		10	1.0	mg/L			06/18/15 03:15	20

Method: 300.0 - Anions, Ion Chromatography - DL2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		8.0	1.6	mg/L			06/18/15 03:31	400

Method: 300.0 - Anions, Ion Chromatography - DL3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as N	ND		200	30	mg/L			06/18/15 03:46	10000

Method: 300.0 - Anions, Ion Chromatography - RADL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**130000**		10000	1000	mg/L			06/19/15 15:20	50000

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		25000	9400	ug/L		06/19/15 14:00	06/23/15 10:02	500
Arsenic	ND		25000	4500	ug/L		06/19/15 14:00	06/23/15 10:02	500
Barium	ND		130000	5300	ug/L		06/19/15 14:00	06/23/15 10:02	500
Boron	ND		130000	18000	ug/L		06/19/15 14:00	06/23/15 10:02	500
Cadmium	ND		13000	840	ug/L		06/19/15 14:00	06/23/15 10:02	500
Calcium	ND		2500000	140000	ug/L		06/19/15 14:00	06/23/15 10:02	500
Chromium	**30000**		25000	8400	ug/L		06/19/15 14:00	06/23/15 10:02	500
Copper	**6300**	**J**	63000	5300	ug/L		06/19/15 14:00	06/23/15 10:02	500
Iron	**75000**	**J ^**	250000	32000	ug/L		06/19/15 14:00	06/23/15 10:02	500
Lead	ND		25000	1500	ug/L		06/19/15 14:00	06/23/15 10:02	500
Magnesium	ND		2500000	130000	ug/L		06/19/15 14:00	06/23/15 10:02	500
Manganese	ND		38000	2500	ug/L		06/19/15 14:00	06/23/15 10:02	500
Molybdenum	ND		100000	4800	ug/L		06/19/15 14:00	06/23/15 10:02	500
Nickel	**11000**	**J**	100000	6400	ug/L		06/19/15 14:00	06/23/15 10:02	500
Potassium	ND		13000000	1100000	ug/L		06/19/15 14:00	06/23/15 10:02	500
Selenium	ND		38000	5200	ug/L		06/19/15 14:00	06/23/15 10:02	500
Silver	**3000**	**J**	25000	2500	ug/L		06/19/15 14:00	06/23/15 10:02	500
Sodium	**88000000**		2500000	260000	ug/L		06/19/15 14:00	06/23/15 10:02	500
Strontium	ND		13000	590	ug/L		06/19/15 14:00	06/25/15 11:25	500
Sulfur	ND		13000000	670000	ug/L		06/19/15 14:00	06/23/15 10:02	500
Zinc	**21000**	**J**	50000	21000	ug/L		06/19/15 14:00	06/23/15 10:02	500

Method: 6010C - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		25	0.22	mg/L		06/19/15 14:30	06/22/15 14:20	50
Barium	ND	F1 F2	6.3	0.27	mg/L		06/19/15 14:30	06/22/15 14:20	50
Cadmium	**0.088**	**J**	0.63	0.042	mg/L		06/19/15 14:30	06/22/15 14:20	50
Chromium	**4.9**	**F1**	1.3	0.42	mg/L		06/19/15 14:30	06/22/15 14:20	50
Lead	**0.088**	**J**	13	0.075	mg/L		06/19/15 14:30	06/22/15 14:20	50
Selenium	**0.39**	**J B**	25	0.26	mg/L		06/19/15 14:30	06/22/15 14:20	50
Silver	ND	F1	1.3	0.12	mg/L		06/19/15 14:30	06/22/15 14:20	50

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**150**		10	3.0	ug/L		06/19/15 09:26	06/19/15 17:07	10

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0033		0.0010	0.000079	mg/L		06/19/15 09:23	06/19/15 16:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fats, Oils or Grease	8.5		3.8	1.3	mg/L		06/24/15 11:37	06/24/15 11:37	1
Cyanide, Total	ND		0.50	0.35	mg/L		06/24/15 18:03	06/25/15 12:18	1
Ammonia	3.0		1.0	0.60	mg/L		06/19/15 10:50	06/22/15 11:42	1
Kjeldahl Nitrogen as N	1.3	J B	5.0	1.2	mg/L		06/23/15 20:35	06/24/15 10:51	1
Phosphorus, Total	ND		2.0	1.0	mg/L		06/26/15 17:17	06/28/15 13:21	1
Bicarbonate Alkalinity as CaCO3	ND		10	5.0	mg/L			06/19/15 17:05	1
Alkalinity	ND		10	5.0	mg/L			06/19/15 17:05	1
Total Dissolved Solids	300000	H E	1000	700	mg/L			06/27/15 15:27	1
Total Suspended Solids	930	H	20	14	mg/L			07/01/15 13:53	1
Chlorine, Total Residual	0.42	HF	0.10	0.040	mg/L			06/29/15 15:48	1
pH	8.68	HF	0.100	0.100	SU			06/19/15 14:08	1
Sulfide, Dissolved	22	F1	1.0	0.50	mg/L			06/23/15 17:09	1
Total Sulfide	43	F1	1.0	0.50	mg/L			06/21/15 23:30	1
Sulfite	31	HF	5.0	2.5	mg/L			06/28/15 11:13	1
Chemical Oxygen Demand	6000	B	2000	400	mg/L			06/19/15 15:13	100
Biochemical Oxygen Demand	6800	b	6000	6000	mg/L			06/18/15 14:50	100

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: LCS 160-196001/12
Matrix: Water
Analysis Batch: 196001

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	0.500	0.515		mg/L		103	79 - 117
1,2-Dichloroethane	0.500	0.514		mg/L		103	80 - 115
2-Butanone (MEK)	0.500	0.540		mg/L		108	64 - 117
Benzene	0.500	0.507		mg/L		101	85 - 115
Carbon tetrachloride	0.500	0.511		mg/L		102	79 - 119
Chlorobenzene	0.500	0.527		mg/L		105	85 - 115
Chloroform	0.500	0.512		mg/L		102	85 - 115
Tetrachloroethene	0.500	0.516		mg/L		103	79 - 116
Trichloroethene	0.500	0.509		mg/L		102	85 - 115
Vinyl chloride	0.500	0.504		mg/L		101	72 - 136

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*83 - 117*
4-Bromofluorobenzene (Surr)	*101*		*84 - 120*
Dibromofluoromethane (Surr)	*101*		*85 - 115*
Toluene-d8 (Surr)	*102*		*85 - 115*

Lab Sample ID: MB 160-197153/13
Matrix: Water
Analysis Batch: 197153

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	0.25	ug/L			06/24/15 22:12	1
1,1,1-Trichloroethane	ND		5.0	0.29	ug/L			06/24/15 22:12	1
1,1,2,2-Tetrachloroethane	ND		5.0	0.43	ug/L			06/24/15 22:12	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.0	0.25	ug/L			06/24/15 22:12	1
1,1,2-Trichloroethane	ND		5.0	0.57	ug/L			06/24/15 22:12	1
1,1-Dichloroethane	ND		5.0	0.39	ug/L			06/24/15 22:12	1
1,1-Dichloroethene	ND		5.0	0.37	ug/L			06/24/15 22:12	1
1,1-Dichloropropene	ND		5.0	0.30	ug/L			06/24/15 22:12	1
1,2,3-Trichlorobenzene	ND		5.0	0.65	ug/L			06/24/15 22:12	1
1,2,3-Trichloropropane	ND		5.0	0.56	ug/L			06/24/15 22:12	1
1,2,4-Trichlorobenzene	ND		5.0	0.55	ug/L			06/24/15 22:12	1
1,2,4-Trimethylbenzene	ND		5.0	0.40	ug/L			06/24/15 22:12	1
1,2-Dibromo-3-Chloropropane	ND		10	1.2	ug/L			06/24/15 22:12	1
1,2-Dibromoethane (EDB)	ND		5.0	0.44	ug/L			06/24/15 22:12	1
1,2-Dichlorobenzene	ND		5.0	0.28	ug/L			06/24/15 22:12	1
1,2-Dichloroethane	ND		5.0	0.37	ug/L			06/24/15 22:12	1
1,2-Dichloropropane	ND		5.0	0.32	ug/L			06/24/15 22:12	1
1,3,5-Trichlorobenzene	ND		5.0	0.51	ug/L			06/24/15 22:12	1
1,3,5-Trimethylbenzene	ND		5.0	0.28	ug/L			06/24/15 22:12	1
1,3-Dichlorobenzene	ND		5.0	0.23	ug/L			06/24/15 22:12	1
1,3-Dichloropropane	ND		5.0	0.24	ug/L			06/24/15 22:12	1
1,4-Dichlorobenzene	ND		5.0	0.35	ug/L			06/24/15 22:12	1
2,2-Dichloropropane	ND		5.0	0.54	ug/L			06/24/15 22:12	1
2-Butanone (MEK)	ND		20	0.39	ug/L			06/24/15 22:12	1
2-Chlorotoluene	ND		5.0	0.34	ug/L			06/24/15 22:12	1
2-Hexanone	ND		20	0.59	ug/L			06/24/15 22:12	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 160-197153/13
Matrix: Water
Analysis Batch: 197153

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chlorotoluene	ND		5.0	0.31	ug/L			06/24/15 22:12	1
4-Isopropyltoluene	ND		5.0	0.32	ug/L			06/24/15 22:12	1
4-Methyl-2-pentanone (MIBK)	ND		20	0.33	ug/L			06/24/15 22:12	1
Acetone	ND		20	6.7	ug/L			06/24/15 22:12	1
Acrylonitrile	ND		50	1.7	ug/L			06/24/15 22:12	1
Benzene	ND		5.0	0.25	ug/L			06/24/15 22:12	1
Bromochloromethane	ND		5.0	0.55	ug/L			06/24/15 22:12	1
Bromodichloromethane	ND		5.0	0.25	ug/L			06/24/15 22:12	1
Bromoform	ND		5.0	0.37	ug/L			06/24/15 22:12	1
Bromomethane	ND		10	0.40	ug/L			06/24/15 22:12	1
Carbon disulfide	ND		5.0	0.37	ug/L			06/24/15 22:12	1
Carbon tetrachloride	ND		5.0	0.36	ug/L			06/24/15 22:12	1
Chlorobenzene	ND		5.0	0.38	ug/L			06/24/15 22:12	1
Chloroethane	ND		10	0.38	ug/L			06/24/15 22:12	1
Chloroform	ND		5.0	0.15	ug/L			06/24/15 22:12	1
Chloromethane	ND		10	0.55	ug/L			06/24/15 22:12	1
cis-1,2-Dichloroethene	ND		5.0	0.16	ug/L			06/24/15 22:12	1
cis-1,3-Dichloropropene	ND		5.0	0.34	ug/L			06/24/15 22:12	1
Cyclohexane	ND		10	0.36	ug/L			06/24/15 22:12	1
Dibromochloromethane	ND		5.0	0.33	ug/L			06/24/15 22:12	1
Dibromomethane	ND		5.0	0.41	ug/L			06/24/15 22:12	1
Dichlorodifluoromethane	ND		10	0.45	ug/L			06/24/15 22:12	1
Ethylbenzene	ND		5.0	0.30	ug/L			06/24/15 22:12	1
Isopropylbenzene	ND		5.0	0.26	ug/L			06/24/15 22:12	1
Methyl acetate	ND		25	2.3	ug/L			06/24/15 22:12	1
Methyl tert-butyl ether	ND		5.0	0.40	ug/L			06/24/15 22:12	1
Methylcyclohexane	ND		10	0.26	ug/L			06/24/15 22:12	1
Methylene Chloride	ND		5.0	1.7	ug/L			06/24/15 22:12	1
m-Xylene & p-Xylene	ND		5.0	0.57	ug/L			06/24/15 22:12	1
n-Butylbenzene	ND		5.0	0.23	ug/L			06/24/15 22:12	1
N-Propylbenzene	ND		5.0	0.30	ug/L			06/24/15 22:12	1
o-Xylene	ND		5.0	0.32	ug/L			06/24/15 22:12	1
sec-Butylbenzene	ND		5.0	0.31	ug/L			06/24/15 22:12	1
Styrene	ND		5.0	0.35	ug/L			06/24/15 22:12	1
tert-Butylbenzene	ND		5.0	0.31	ug/L			06/24/15 22:12	1
Tetrachloroethene	ND		5.0	0.28	ug/L			06/24/15 22:12	1
Toluene	ND		5.0	1.0	ug/L			06/24/15 22:12	1
trans-1,2-Dichloroethene	ND		5.0	0.18	ug/L			06/24/15 22:12	1
trans-1,3-Dichloropropene	ND		5.0	0.35	ug/L			06/24/15 22:12	1
Trichloroethene	ND		5.0	0.29	ug/L			06/24/15 22:12	1
Trichlorofluoromethane	ND		5.0	0.22	ug/L			06/24/15 22:12	1
Vinyl chloride	ND		5.0	0.43	ug/L			06/24/15 22:12	1
Xylenes, Total	ND		10	0.85	ug/L			06/24/15 22:12	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 160-197153/10
Matrix: Water
Analysis Batch: 197153

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	50.0	50.0		ug/L		100	80 - 120
1,1,1-Trichloroethane	50.0	56.0		ug/L		112	75 - 127
1,1,2,2-Tetrachloroethane	50.0	45.9		ug/L		92	80 - 120
1,1,2-Trichloro-1,2,2-trifluoroethane	50.0	52.9		ug/L		106	80 - 120
1,1,2-Trichloroethane	50.0	46.7		ug/L		93	80 - 120
1,1-Dichloroethane	50.0	51.1		ug/L		102	80 - 120
1,1-Dichloroethene	50.0	53.0		ug/L		106	77 - 121
1,1-Dichloropropene	50.0	50.8		ug/L		102	80 - 120
1,2,3-Trichlorobenzene	50.0	48.4		ug/L		97	75 - 130
1,2,3-Trichloropropane	50.0	51.5		ug/L		103	80 - 120
1,2,4-Trichlorobenzene	50.0	49.9		ug/L		100	82 - 124
1,2,4-Trimethylbenzene	50.0	52.5		ug/L		105	84 - 122
1,2-Dibromo-3-Chloropropane	50.0	44.8		ug/L		90	69 - 135
1,2-Dibromoethane (EDB)	50.0	51.2		ug/L		102	80 - 120
1,2-Dichlorobenzene	50.0	49.4		ug/L		99	76 - 122
1,2-Dichloroethane	50.0	55.1		ug/L		110	80 - 120
1,2-Dichloropropane	50.0	47.9		ug/L		96	80 - 120
1,3,5-Trimethylbenzene	50.0	51.8		ug/L		104	87 - 123
1,3-Dichlorobenzene	50.0	49.9		ug/L		100	77 - 122
1,3-Dichloropropane	50.0	49.7		ug/L		99	80 - 120
1,4-Dichlorobenzene	50.0	48.8		ug/L		98	80 - 120
2,2-Dichloropropane	50.0	55.5		ug/L		111	73 - 134
2-Butanone (MEK)	50.0	46.6		ug/L		93	68 - 128
2-Chlorotoluene	50.0	50.0		ug/L		100	80 - 122
2-Hexanone	50.0	42.9		ug/L		86	64 - 136
4-Chlorotoluene	50.0	50.9		ug/L		102	80 - 122
4-Isopropyltoluene	50.0	51.0		ug/L		102	85 - 125
4-Methyl-2-pentanone (MIBK)	50.0	46.2		ug/L		92	74 - 129
Acetone	50.0	41.5		ug/L		83	72 - 139
Acrylonitrile	500	476		ug/L		95	80 - 120
Benzene	50.0	47.6		ug/L		95	80 - 120
Bromochloromethane	50.0	52.1		ug/L		104	80 - 120
Bromodichloromethane	50.0	55.7		ug/L		111	80 - 120
Bromoform	50.0	52.2		ug/L		104	80 - 120
Bromomethane	50.0	42.8		ug/L		86	48 - 140
Carbon disulfide	50.0	50.1		ug/L		100	79 - 120
Carbon tetrachloride	50.0	57.3		ug/L		115	74 - 128
Chlorobenzene	50.0	50.1		ug/L		100	80 - 120
Chloroethane	50.0	50.6		ug/L		101	55 - 140
Chloroform	50.0	52.7		ug/L		105	80 - 120
Chloromethane	50.0	40.8		ug/L		82	72 - 123
cis-1,2-Dichloroethene	50.0	47.4		ug/L		95	80 - 120
cis-1,3-Dichloropropene	50.0	52.2		ug/L		104	80 - 120
Cyclohexane	50.0	49.2		ug/L		98	77 - 127
Dibromochloromethane	50.0	53.1		ug/L		106	80 - 120
Dibromomethane	50.0	53.5		ug/L		107	80 - 120
Dichlorodifluoromethane	50.0	50.9		ug/L		102	49 - 140

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 160-197153/10
Matrix: Water
Analysis Batch: 197153

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethylbenzene	50.0	52.9		ug/L		106	80 - 120
Isopropylbenzene	50.0	50.6		ug/L		101	80 - 127
Methyl acetate	250	236		ug/L		94	66 - 132
Methyl tert-butyl ether	50.0	49.0		ug/L		98	77 - 124
Methylcyclohexane	50.0	49.3		ug/L		99	75 - 131
Methylene Chloride	50.0	50.5		ug/L		101	79 - 115
m-Xylene & p-Xylene	50.0	49.2		ug/L		98	80 - 120
n-Butylbenzene	50.0	50.3		ug/L		101	87 - 123
N-Propylbenzene	50.0	51.3		ug/L		103	79 - 125
o-Xylene	50.0	47.8		ug/L		96	79 - 126
sec-Butylbenzene	50.0	51.0		ug/L		102	80 - 123
Styrene	50.0	49.5		ug/L		99	80 - 120
tert-Butylbenzene	50.0	51.9		ug/L		104	78 - 128
Tetrachloroethene	50.0	48.4		ug/L		97	80 - 120
Toluene	50.0	48.0		ug/L		96	80 - 120
trans-1,2-Dichloroethene	50.0	49.7		ug/L		99	80 - 120
trans-1,3-Dichloropropene	50.0	54.4		ug/L		109	80 - 120
Trichloroethene	50.0	48.0		ug/L		96	80 - 120
Trichlorofluoromethane	50.0	56.4		ug/L		113	72 - 132
Vinyl chloride	50.0	39.8		ug/L		80	68 - 120
Xylenes, Total	100	97.0		ug/L		97	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*114*		*78 - 127*
4-Bromofluorobenzene (Surr)	*99*		*75 - 123*
Dibromofluoromethane (Surr)	*104*		*80 - 120*
Toluene-d8 (Surr)	*101*		*80 - 120*

Lab Sample ID: LCSD 160-197153/11
Matrix: Water
Analysis Batch: 197153

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1,2-Tetrachloroethane	50.0	53.0		ug/L		106	80 - 120	6	20
1,1,1-Trichloroethane	50.0	56.9		ug/L		114	75 - 127	2	20
1,1,2,2-Tetrachloroethane	50.0	44.4		ug/L		89	80 - 120	3	20
1,1,2-Trichloro-1,2,2-trifluoroethane	50.0	53.8		ug/L		108	80 - 120	2	20
1,1,2-Trichloroethane	50.0	49.5		ug/L		99	80 - 120	6	20
1,1-Dichloroethane	50.0	50.0		ug/L		100	80 - 120	2	20
1,1-Dichloroethene	50.0	52.6		ug/L		105	77 - 121	1	20
1,1-Dichloropropene	50.0	51.7		ug/L		103	80 - 120	2	20
1,2,3-Trichlorobenzene	50.0	47.8		ug/L		96	75 - 130	1	20
1,2,3-Trichloropropane	50.0	51.5		ug/L		103	80 - 120	0	20
1,2,4-Trichlorobenzene	50.0	48.1		ug/L		96	82 - 124	4	20
1,2,4-Trimethylbenzene	50.0	51.6		ug/L		103	84 - 122	2	20
1,2-Dibromo-3-Chloropropane	50.0	41.4		ug/L		83	69 - 135	8	20
1,2-Dibromoethane (EDB)	50.0	49.2		ug/L		98	80 - 120	4	20

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 160-197153/11
Matrix: Water
Analysis Batch: 197153

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dichlorobenzene	50.0	50.0		ug/L		100	76 - 122	1	20
1,2-Dichloroethane	50.0	54.5		ug/L		109	80 - 120	1	20
1,2-Dichloropropane	50.0	47.0		ug/L		94	80 - 120	2	20
1,3,5-Trimethylbenzene	50.0	52.1		ug/L		104	87 - 123	1	20
1,3-Dichlorobenzene	50.0	48.8		ug/L		98	77 - 122	2	20
1,3-Dichloropropane	50.0	49.5		ug/L		99	80 - 120	0	20
1,4-Dichlorobenzene	50.0	47.7		ug/L		95	80 - 120	2	20
2,2-Dichloropropane	50.0	54.8		ug/L		110	73 - 134	1	20
2-Butanone (MEK)	50.0	47.7		ug/L		95	68 - 128	2	20
2-Chlorotoluene	50.0	51.1		ug/L		102	80 - 122	2	20
2-Hexanone	50.0	41.0		ug/L		82	64 - 136	5	20
4-Chlorotoluene	50.0	50.2		ug/L		100	80 - 122	1	20
4-Isopropyltoluene	50.0	51.5		ug/L		103	85 - 125	1	20
4-Methyl-2-pentanone (MIBK)	50.0	48.1		ug/L		96	74 - 129	4	20
Acetone	50.0	48.0		ug/L		96	72 - 139	14	20
Acrylonitrile	500	448		ug/L		90	80 - 120	6	20
Benzene	50.0	47.1		ug/L		94	80 - 120	1	20
Bromochloromethane	50.0	50.7		ug/L		101	80 - 120	3	20
Bromodichloromethane	50.0	53.1		ug/L		106	80 - 120	5	20
Bromoform	50.0	50.4		ug/L		101	80 - 120	4	20
Bromomethane	50.0	51.7		ug/L		103	48 - 140	19	20
Carbon disulfide	50.0	51.4		ug/L		103	79 - 120	3	20
Carbon tetrachloride	50.0	58.0		ug/L		116	74 - 128	1	20
Chlorobenzene	50.0	50.7		ug/L		101	80 - 120	1	20
Chloroethane	50.0	50.0		ug/L		100	55 - 140	1	20
Chloroform	50.0	53.3		ug/L		107	80 - 120	1	20
Chloromethane	50.0	47.4		ug/L		95	72 - 123	15	20
cis-1,2-Dichloroethene	50.0	47.8		ug/L		96	80 - 120	1	20
cis-1,3-Dichloropropene	50.0	50.0		ug/L		100	80 - 120	4	20
Cyclohexane	50.0	50.1		ug/L		100	77 - 127	2	20
Dibromochloromethane	50.0	51.9		ug/L		104	80 - 120	2	20
Dibromomethane	50.0	52.5		ug/L		105	80 - 120	2	20
Dichlorodifluoromethane	50.0	52.5		ug/L		105	49 - 140	3	20
Ethylbenzene	50.0	54.1		ug/L		108	80 - 120	2	20
Isopropylbenzene	50.0	52.1		ug/L		104	80 - 127	3	20
Methyl acetate	250	227		ug/L		91	66 - 132	4	20
Methyl tert-butyl ether	50.0	50.4		ug/L		101	77 - 124	3	20
Methylcyclohexane	50.0	49.0		ug/L		98	75 - 131	1	20
Methylene Chloride	50.0	51.6		ug/L		103	79 - 115	2	20
m-Xylene & p-Xylene	50.0	50.1		ug/L		100	80 - 120	2	20
n-Butylbenzene	50.0	51.0		ug/L		102	87 - 123	1	20
N-Propylbenzene	50.0	51.5		ug/L		103	79 - 125	1	20
o-Xylene	50.0	50.8		ug/L		102	79 - 126	6	20
sec-Butylbenzene	50.0	50.5		ug/L		101	80 - 123	1	20
Styrene	50.0	49.5		ug/L		99	80 - 120	0	20
tert-Butylbenzene	50.0	52.6		ug/L		105	78 - 128	1	20
Tetrachloroethene	50.0	51.5		ug/L		103	80 - 120	6	20
Toluene	50.0	47.8		ug/L		96	80 - 120	0	20

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 160-197153/11
Matrix: Water
Analysis Batch: 197153

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
trans-1,2-Dichloroethene			50.0	48.2		ug/L		96	80 - 120	3	20
trans-1,3-Dichloropropene			50.0	51.1		ug/L		102	80 - 120	6	20
Trichloroethene			50.0	48.1		ug/L		96	80 - 120	0	20
Trichlorofluoromethane			50.0	58.1		ug/L		116	72 - 132	3	20
Vinyl chloride			50.0	44.8		ug/L		90	68 - 120	12	20
Xylenes, Total			100	101		ug/L		101	80 - 120	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*111*		*78 - 127*
4-Bromofluorobenzene (Surr)	*97*		*75 - 123*
Dibromofluoromethane (Surr)	*107*		*80 - 120*
Toluene-d8 (Surr)	*98*		*80 - 120*

Lab Sample ID: LB 160-196022/1-A
Matrix: Water
Analysis Batch: 196001

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.050	0.0037	mg/L			06/18/15 12:32	1
1,2-Dichloroethane	ND		0.050	0.0037	mg/L			06/18/15 12:32	1
2-Butanone (MEK)	ND		0.050	0.0039	mg/L			06/18/15 12:32	1
Benzene	ND		0.050	0.0025	mg/L			06/18/15 12:32	1
Carbon tetrachloride	ND		0.050	0.0036	mg/L			06/18/15 12:32	1
Chlorobenzene	ND		0.050	0.0038	mg/L			06/18/15 12:32	1
Chloroform	ND		0.050	0.00092	mg/L			06/18/15 12:32	1
Tetrachloroethene	ND		0.050	0.0028	mg/L			06/18/15 12:32	1
Trichloroethene	ND		0.050	0.0029	mg/L			06/18/15 12:32	1
Vinyl chloride	ND		0.10	0.0043	mg/L			06/18/15 12:32	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*83 - 117*		*06/18/15 12:32*	*1*
4-Bromofluorobenzene (Surr)	*103*		*84 - 120*		*06/18/15 12:32*	*1*
Dibromofluoromethane (Surr)	*105*		*85 - 115*		*06/18/15 12:32*	*1*
Toluene-d8 (Surr)	*95*		*85 - 115*		*06/18/15 12:32*	*1*

Lab Sample ID: 160-12349-1 MS
Matrix: Water
Analysis Batch: 196001

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	ND		0.500	0.512		mg/L		102	80 - 115
1,2-Dichloroethane	ND		0.500	0.513		mg/L		103	85 - 115
Benzene	0.058		0.500	0.559		mg/L		100	85 - 115
Carbon tetrachloride	ND		0.500	0.532		mg/L		106	79 - 117
Chlorobenzene	ND		0.500	0.510		mg/L		102	85 - 115
Chloroform	0.14		0.500	0.665		mg/L		105	85 - 115
Tetrachloroethene	0.0045	J	0.500	0.496		mg/L		98	82 - 115
Trichloroethene	ND		0.500	0.565		mg/L		113	84 - 115

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 160-12349-1 MS
Matrix: Water
Analysis Batch: 196001

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl chloride	ND		0.500	0.500		mg/L		100	75 - 132

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*106*		*83 - 117*
4-Bromofluorobenzene (Surr)	*98*		*84 - 120*
Dibromofluoromethane (Surr)	*101*		*85 - 115*
Toluene-d8 (Surr)	*103*		*85 - 115*

Lab Sample ID: 160-12349-1 MSD
Matrix: Water
Analysis Batch: 196001

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	ND		0.500	0.515		mg/L		103	80 - 115	0	20
1,2-Dichloroethane	ND		0.500	0.480		mg/L		96	85 - 115	7	20
Benzene	0.058		0.500	0.553		mg/L		99	85 - 115	1	20
Carbon tetrachloride	ND		0.500	0.495		mg/L		99	79 - 117	7	20
Chlorobenzene	ND		0.500	0.509		mg/L		102	85 - 115	0	20
Chloroform	0.14		0.500	0.646		mg/L		101	85 - 115	3	20
Tetrachloroethene	0.0045	J	0.500	0.511		mg/L		101	82 - 115	3	20
Trichloroethene	ND		0.500	0.549		mg/L		110	84 - 115	3	20
Vinyl chloride	ND		0.500	0.501		mg/L		100	75 - 132	0	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*83 - 117*
4-Bromofluorobenzene (Surr)	*95*		*84 - 120*
Dibromofluoromethane (Surr)	*103*		*85 - 115*
Toluene-d8 (Surr)	*107*		*85 - 115*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 160-196049/1-A
Matrix: Water
Analysis Batch: 196110

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 196049

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
1,2-Dichlorobenzene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
1,3-Dichlorobenzene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
1,4-Dichlorobenzene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
1,4-Dioxane	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
2,4-Dichlorophenol	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
2,4-Dimethylphenol	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
2,4,5-Trichlorophenol	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
2,4-Dinitrophenol	ND		50	2.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
2,4,6-Trichlorophenol	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
2,4-Dinitrotoluene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 160-196049/1-A
Matrix: Water
Analysis Batch: 196110

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 196049

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,6-Dinitrotoluene	ND		10	2.2	ug/L		06/18/15 11:00	06/18/15 18:27	1
2-Chloronaphthalene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
2-Chlorophenol	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
2-Methylnaphthalene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
2-Methylphenol	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
2-Nitroaniline	ND		10	1.1	ug/L		06/18/15 11:00	06/18/15 18:27	1
2-Nitrophenol	ND		10	1.5	ug/L		06/18/15 11:00	06/18/15 18:27	1
3 & 4 Methylphenol	ND		20	2.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
3,3'-Dichlorobenzidine	ND		50	1.3	ug/L		06/18/15 11:00	06/18/15 18:27	1
3-Nitroaniline	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
4,6-Dinitro-2-methylphenol	ND		10	1.3	ug/L		06/18/15 11:00	06/18/15 18:27	1
4-Bromophenyl phenyl ether	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
4-Chloro-3-methylphenol	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
4-Chloroaniline	ND		10	2.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
4-Chlorophenyl phenyl ether	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
4-Nitroaniline	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
4-Nitrophenol	ND		10	2.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Acenaphthene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Acenaphthylene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Aniline	ND		10	1.3	ug/L		06/18/15 11:00	06/18/15 18:27	1
Anthracene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Benzo[a]anthracene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Benzo[a]pyrene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Benzo[b]fluoranthene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Benzo[g,h,i]perylene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Benzo[k]fluoranthene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Benzyl alcohol	ND		10	3.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
bis (2-chloroisopropyl) ether	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Bis(2-chloroethoxy)methane	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Bis(2-chloroethyl)ether	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Bis(2-ethylhexyl) phthalate	ND		10	1.9	ug/L		06/18/15 11:00	06/18/15 18:27	1
Butyl benzyl phthalate	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Carbazole	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Chrysene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Dibenz(a,h)anthracene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Dibenzofuran	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Diethyl phthalate	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Dimethyl phthalate	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Di-n-butyl phthalate	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Di-n-octyl phthalate	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Diphenylamine	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Fluoranthene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Fluorene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Hexachlorobenzene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Hexachlorobutadiene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Hexachlorocyclopentadiene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Hexachloroethane	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Indeno[1,2,3-cd]pyrene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 160-196049/1-A
Matrix: Water
Analysis Batch: 196110

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 196049

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isophorone	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Naphthalene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Nitrobenzene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
N-Nitrosodi-n-propylamine	ND		10	1.5	ug/L		06/18/15 11:00	06/18/15 18:27	1
Pentachlorophenol	ND		10	1.3	ug/L		06/18/15 11:00	06/18/15 18:27	1
Phenanthrene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Phenol	ND		10	2.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Pyrene	ND		10	1.0	ug/L		06/18/15 11:00	06/18/15 18:27	1
Pyridine	ND		20	2.0	ug/L		06/18/15 11:00	06/18/15 18:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*90*		*47 - 103*	*06/18/15 11:00*	*06/18/15 18:27*	*1*
2-Fluorobiphenyl (Surr)	*77*		*30 - 99*	*06/18/15 11:00*	*06/18/15 18:27*	*1*
2-Fluorophenol (Surr)	*55*		*10 - 74*	*06/18/15 11:00*	*06/18/15 18:27*	*1*
Nitrobenzene-d5 (Surr)	*84*		*31 - 105*	*06/18/15 11:00*	*06/18/15 18:27*	*1*
Phenol-d5 (Surr)	*40*		*10 - 50*	*06/18/15 11:00*	*06/18/15 18:27*	*1*
Terphenyl-d14 (Surr)	*79*		*68 - 116*	*06/18/15 11:00*	*06/18/15 18:27*	*1*

Lab Sample ID: LCS 160-196049/2-A
Matrix: Water
Analysis Batch: 196110

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196049

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,4-Trichlorobenzene	200	140		ug/L		70	50 - 90
1,2-Dichlorobenzene	200	138		ug/L		69	49 - 89
1,3-Dichlorobenzene	200	135		ug/L		68	45 - 88
1,4-Dichlorobenzene	200	134		ug/L		67	46 - 88
2,4-Dichlorophenol	200	149		ug/L		75	59 - 81
2,4-Dimethylphenol	200	146		ug/L		73	48 - 96
2,4,5-Trichlorophenol	200	156		ug/L		78	60 - 86
2,4-Dinitrophenol	200	140		ug/L		70	38 - 95
2,4,6-Trichlorophenol	200	154		ug/L		77	61 - 86
2,4-Dinitrotoluene	200	160		ug/L		80	62 - 94
2,6-Dinitrotoluene	200	158		ug/L		79	61 - 94
2-Chloronaphthalene	200	148		ug/L		74	52 - 92
2-Chlorophenol	200	137		ug/L		69	54 - 81
2-Methylnaphthalene	200	147		ug/L		73	53 - 86
2-Methylphenol	200	125		ug/L		63	47 - 75
2-Nitroaniline	200	157		ug/L		79	53 - 98
2-Nitrophenol	200	161		ug/L		80	59 - 88
3 & 4 Methylphenol	200	133		ug/L		66	40 - 79
3,3'-Dichlorobenzidine	200	137		ug/L		68	43 - 80
3-Nitroaniline	200	149		ug/L		74	41 - 84
4,6-Dinitro-2-methylphenol	200	173		ug/L		86	60 - 98
4-Bromophenyl phenyl ether	200	164		ug/L		82	62 - 98
4-Chloro-3-methylphenol	200	144		ug/L		72	56 - 83
4-Chloroaniline	200	135	*	ug/L		67	31 - 66
4-Chlorophenyl phenyl ether	200	152		ug/L		76	58 - 90

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 160-196049/2-A
Matrix: Water
Analysis Batch: 196110

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196049

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Nitroaniline	200	155		ug/L		78	55 - 87
4-Nitrophenol	200	74.2	*	ug/L		37	21 - 36
Acenaphthene	200	148		ug/L		74	55 - 92
Acenaphthylene	200	144		ug/L		72	56 - 93
Anthracene	200	154		ug/L		77	60 - 93
Benzo[a]anthracene	200	158		ug/L		79	72 - 106
Benzo[a]pyrene	200	154		ug/L		77	62 - 94
Benzo[b]fluoranthene	200	162		ug/L		81	67 - 103
Benzo[g,h,i]perylene	200	175		ug/L		88	63 - 117
Benzo[k]fluoranthene	200	161		ug/L		80	66 - 107
bis (2-chloroisopropyl) ether	200	133		ug/L		66	36 - 103
Bis(2-chloroethoxy)methane	200	157		ug/L		78	53 - 92
Bis(2-chloroethyl)ether	200	152		ug/L		76	48 - 94
Bis(2-ethylhexyl) phthalate	200	167		ug/L		83	58 - 107
Butyl benzyl phthalate	200	166		ug/L		83	57 - 104
Carbazole	200	151		ug/L		76	62 - 95
Chrysene	200	163		ug/L		82	64 - 94
Dibenz(a,h)anthracene	200	176		ug/L		88	66 - 110
Dibenzofuran	200	143		ug/L		72	56 - 87
Diethyl phthalate	200	153		ug/L		77	60 - 91
Dimethyl phthalate	200	158		ug/L		79	62 - 91
Di-n-butyl phthalate	200	160		ug/L		80	60 - 97
Di-n-octyl phthalate	200	167		ug/L		84	61 - 103
Diphenylamine	200	140		ug/L		70	69 - 127
Fluoranthene	200	158		ug/L		79	63 - 93
Fluorene	200	157		ug/L		79	60 - 89
Hexachlorobenzene	200	166		ug/L		83	63 - 97
Hexachlorobutadiene	200	139		ug/L		69	45 - 93
Hexachlorocyclopentadiene	200	72.7		ug/L		36	22 - 93
Hexachloroethane	200	136		ug/L		68	41 - 96
Indeno[1,2,3-cd]pyrene	200	162		ug/L		81	64 - 112
Isophorone	200	150		ug/L		75	48 - 87
Naphthalene	200	144		ug/L		72	52 - 88
Nitrobenzene	200	154		ug/L		77	48 - 97
N-Nitrosodi-n-propylamine	200	149		ug/L		75	51 - 102
Pentachlorophenol	200	157		ug/L		78	47 - 96
Phenanthrene	200	157		ug/L		78	60 - 93
Phenol	200	74.7		ug/L		37	21 - 37
Pyrene	200	159		ug/L		80	58 - 102

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*81*		*47 - 103*
2-Fluorobiphenyl (Surr)	*71*		*30 - 99*
2-Fluorophenol (Surr)	*50*		*10 - 74*
Nitrobenzene-d5 (Surr)	*76*		*31 - 105*
Phenol-d5 (Surr)	*37*		*10 - 50*
Terphenyl-d14 (Surr)	*76*		*68 - 116*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 160-12274-I-1-A MS
Matrix: Water
Analysis Batch: 196110

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 196049

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,4-Trichlorobenzene	ND		197	151		ug/L		77	52 - 84
1,2-Dichlorobenzene	ND		197	151		ug/L		77	45 - 91
1,3-Dichlorobenzene	ND		197	149		ug/L		76	45 - 85
1,4-Dichlorobenzene	ND		197	148		ug/L		75	47 - 86
2,4-Dichlorophenol	ND		197	153		ug/L		78	48 - 92
2,4-Dimethylphenol	ND		197	145		ug/L		74	44 - 92
2,4,5-Trichlorophenol	ND		197	159		ug/L		81	48 - 97
2,4-Dinitrophenol	ND		197	146		ug/L		74	40 - 96
2,4,6-Trichlorophenol	ND		197	160		ug/L		81	48 - 95
2,4-Dinitrotoluene	ND		197	164		ug/L		83	48 - 105
2,6-Dinitrotoluene	ND		197	170		ug/L		86	45 - 106
2-Chloronaphthalene	ND		197	157		ug/L		80	47 - 94
2-Chlorophenol	ND		197	137		ug/L		70	45 - 94
2-Methylnaphthalene	ND		197	155		ug/L		79	50 - 87
2-Methylphenol	ND		197	114		ug/L		58	33 - 95
2-Nitroaniline	ND		197	152		ug/L		77	36 - 110
2-Nitrophenol	ND		197	170		ug/L		87	49 - 96
3 & 4 Methylphenol	ND		197	113		ug/L		58	26 - 113
3,3'-Dichlorobenzidine	ND	F1 F2	197	9.96	J F1	ug/L		5	37 - 87
3-Nitroaniline	ND		197	145		ug/L		74	26 - 102
4,6-Dinitro-2-methylphenol	ND		197	173		ug/L		88	55 - 109
4-Bromophenyl phenyl ether	ND		197	153		ug/L		78	51 - 107
4-Chloro-3-methylphenol	ND		197	140		ug/L		71	40 - 99
4-Chloroaniline	ND	*	197	133		ug/L		68	17 - 79
4-Chlorophenyl phenyl ether	ND		197	146		ug/L		74	50 - 95
4-Nitroaniline	ND		197	126		ug/L		64	41 - 103
4-Nitrophenol	ND	*	197	46.9		ug/L		24	10 - 76
Acenaphthene	ND		197	154		ug/L		78	50 - 96
Acenaphthylene	ND		197	159		ug/L		80	51 - 96
Anthracene	ND		197	145		ug/L		74	55 - 97
Benzo[a]anthracene	ND		197	127		ug/L		65	59 - 118
Benzo[a]pyrene	ND		197	120		ug/L		61	55 - 101
Benzo[b]fluoranthene	ND		197	130		ug/L		66	55 - 112
Benzo[g,h,i]perylene	ND		197	118		ug/L		60	55 - 112
Benzo[k]fluoranthene	ND		197	118		ug/L		60	52 - 115
bis (2-chloroisopropyl) ether	ND		197	144		ug/L		73	28 - 103
Bis(2-chloroethoxy)methane	ND		197	167		ug/L		85	45 - 95
Bis(2-chloroethyl)ether	ND		197	166		ug/L		84	46 - 96
Bis(2-ethylhexyl) phthalate	ND		197	129		ug/L		65	45 - 119
Butyl benzyl phthalate	ND		197	140		ug/L		71	46 - 117
Carbazole	ND		197	158		ug/L		80	54 - 100
Chrysene	ND		197	127		ug/L		65	53 - 103
Dibenz(a,h)anthracene	ND		197	126		ug/L		64	59 - 107
Dibenzofuran	ND		197	147		ug/L		74	51 - 90
Diethyl phthalate	ND		197	160		ug/L		81	48 - 100
Dimethyl phthalate	ND		197	167		ug/L		85	42 - 106
Di-n-butyl phthalate	ND		197	143		ug/L		73	51 - 104
Di-n-octyl phthalate	ND		197	132		ug/L		67	51 - 113

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 160-12274-I-1-A MS
Matrix: Water
Analysis Batch: 196110

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 196049

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Diphenylamine	ND		197	150		ug/L		76	63 - 135
Fluoranthene	ND		197	138		ug/L		70	55 - 97
Fluorene	ND		197	157		ug/L		80	54 - 95
Hexachlorobenzene	ND		197	140		ug/L		71	54 - 103
Hexachlorobutadiene	ND		197	141		ug/L		72	48 - 83
Hexachlorocyclopentadiene	ND		197	102		ug/L		52	22 - 93
Hexachloroethane	ND		197	151		ug/L		77	41 - 92
Indeno[1,2,3-cd]pyrene	ND	F1	197	120	F1	ug/L		61	62 - 111
Isophorone	ND		197	158		ug/L		80	40 - 92
Naphthalene	ND		197	155		ug/L		79	50 - 88
Nitrobenzene	ND		197	174		ug/L		89	41 - 97
N-Nitrosodi-n-propylamine	ND		197	162		ug/L		82	40 - 109
Pentachlorophenol	ND		197	163		ug/L		83	49 - 92
Phenanthrene	ND		197	152		ug/L		77	52 - 99
Phenol	ND		197	51.4		ug/L		26	10 - 70
Pyrene	ND		197	136		ug/L		69	48 - 116

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*87*		*47 - 103*
2-Fluorobiphenyl (Surr)	*78*		*30 - 99*
2-Fluorophenol (Surr)	*40*		*10 - 74*
Nitrobenzene-d5 (Surr)	*86*		*31 - 105*
Phenol-d5 (Surr)	*26*		*10 - 50*
Terphenyl-d14 (Surr)	*61*	*X*	*68 - 116*

Lab Sample ID: 160-12274-J-1-A MSD
Matrix: Water
Analysis Batch: 196110

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 196049

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	ND		197	145		ug/L		74	52 - 84	4	20
1,2-Dichlorobenzene	ND		197	145		ug/L		74	45 - 91	4	20
1,3-Dichlorobenzene	ND		197	142		ug/L		72	45 - 85	5	20
1,4-Dichlorobenzene	ND		197	142		ug/L		72	47 - 86	4	20
2,4-Dichlorophenol	ND		197	147		ug/L		75	48 - 92	4	20
2,4,5-Trichlorophenol	ND		197	153		ug/L		78	48 - 97	4	20
2,4-Dinitrophenol	ND		197	147		ug/L		75	40 - 96	1	20
2,4,6-Trichlorophenol	ND		197	154		ug/L		78	48 - 95	4	20
2,4-Dinitrotoluene	ND		197	158		ug/L		80	48 - 105	3	20
2,6-Dinitrotoluene	ND		197	160		ug/L		81	45 - 106	6	20
2-Chloronaphthalene	ND		197	152		ug/L		77	47 - 94	4	20
2-Chlorophenol	ND		197	131		ug/L		67	45 - 94	5	20
2-Methylnaphthalene	ND		197	149		ug/L		76	50 - 87	4	20
2-Methylphenol	ND		197	110		ug/L		56	33 - 95	4	20
2-Nitroaniline	ND		197	141		ug/L		72	36 - 110	8	20
2-Nitrophenol	ND		197	163		ug/L		83	49 - 96	4	20
3 & 4 Methylphenol	ND		197	110		ug/L		56	26 - 113	3	20
3,3'-Dichlorobenzidine	ND	F1 F2	197	5.82	J F1 F2	ug/L		3	37 - 87	52	20

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 160-12274-J-1-A MSD
Matrix: Water
Analysis Batch: 196110

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 196049

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
3-Nitroaniline	ND		197	138		ug/L		70	26 - 102	5	20
4,6-Dinitro-2-methylphenol	ND		197	170		ug/L		86	55 - 109	2	20
4-Bromophenyl phenyl ether	ND		197	148		ug/L		75	51 - 107	3	20
4-Chloro-3-methylphenol	ND		197	134		ug/L		68	40 - 99	4	20
4-Chloroaniline	ND	*	197	130		ug/L		66	17 - 79	3	20
4-Chlorophenyl phenyl ether	ND		197	140		ug/L		71	50 - 95	4	20
4-Nitroaniline	ND		197	119		ug/L		61	41 - 103	5	20
4-Nitrophenol	ND	*	197	49.7		ug/L		25	10 - 76	6	20
Acenaphthene	ND		197	148		ug/L		75	50 - 96	4	20
Acenaphthylene	ND		197	151		ug/L		77	51 - 96	5	20
Anthracene	ND		197	138		ug/L		70	55 - 97	5	20
Benzo[a]anthracene	ND		197	120		ug/L		61	59 - 118	6	20
Benzo[a]pyrene	ND		197	112		ug/L		57	55 - 101	7	20
Benzo[b]fluoranthene	ND		197	120		ug/L		61	55 - 112	8	20
Benzo[g,h,i]perylene	ND		197	108		ug/L		55	55 - 112	9	20
Benzo[k]fluoranthene	ND		197	114		ug/L		58	52 - 115	4	20
bis (2-chloroisopropyl) ether	ND		197	137		ug/L		70	28 - 103	5	20
Bis(2-chloroethoxy)methane	ND		197	158		ug/L		80	45 - 95	5	20
Bis(2-chloroethyl)ether	ND		197	157		ug/L		80	46 - 96	6	20
Bis(2-ethylhexyl) phthalate	ND		197	123		ug/L		62	45 - 119	5	20
Butyl benzyl phthalate	ND		197	132		ug/L		67	46 - 117	6	20
Carbazole	ND		197	149		ug/L		76	54 - 100	6	20
Chrysene	ND		197	119		ug/L		61	53 - 103	6	20
Dibenz(a,h)anthracene	ND		197	121		ug/L		61	59 - 107	4	20
Dibenzofuran	ND		197	141		ug/L		72	51 - 90	4	20
Diethyl phthalate	ND		197	152		ug/L		77	48 - 100	5	20
Dimethyl phthalate	ND		197	159		ug/L		81	42 - 106	5	20
Di-n-butyl phthalate	ND		197	137		ug/L		70	51 - 104	4	20
Di-n-octyl phthalate	ND		197	124		ug/L		63	51 - 113	6	20
Diphenylamine	ND		197	142		ug/L		72	63 - 135	5	20
Fluoranthene	ND		197	133		ug/L		68	55 - 97	3	20
Fluorene	ND		197	150		ug/L		76	54 - 95	4	20
Hexachlorobenzene	ND		197	134		ug/L		68	54 - 103	5	20
Hexachlorobutadiene	ND		197	136		ug/L		69	48 - 83	3	20
Hexachlorocyclopentadiene	ND		197	99.9		ug/L		51	22 - 93	2	20
Hexachloroethane	ND		197	146		ug/L		74	41 - 92	4	20
Indeno[1,2,3-cd]pyrene	ND	F1	197	112	F1	ug/L		57	62 - 111	7	20
Isophorone	ND		197	152		ug/L		77	40 - 92	4	20
Naphthalene	ND		197	148		ug/L		75	50 - 88	5	20
Nitrobenzene	ND		197	166		ug/L		84	41 - 97	5	20
N-Nitrosodi-n-propylamine	ND		197	153		ug/L		78	40 - 109	5	20
Pentachlorophenol	ND		197	157		ug/L		80	49 - 92	4	20
Phenanthrene	ND		197	143		ug/L		73	52 - 99	6	20
Phenol	ND		197	50.4		ug/L		26	10 - 70	2	20
Pyrene	ND		197	128		ug/L		65	48 - 116	6	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*83*		*47 - 103*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 160-12274-J-1-A MSD
Matrix: Water
Analysis Batch: 196110

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 196049

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*74*		*30 - 99*
2-Fluorophenol (Surr)	*39*		*10 - 74*
Nitrobenzene-d5 (Surr)	*81*		*31 - 105*
Phenol-d5 (Surr)	*25*		*10 - 50*
Terphenyl-d14 (Surr)	*57*	*X*	*68 - 116*

Lab Sample ID: LB 160-197372/1-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197372

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.050	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
2,4,5-Trichlorophenol	ND		0.050	0.010	mg/L		06/25/15 15:57	06/29/15 13:30	1
2,4,6-Trichlorophenol	ND		0.050	0.010	mg/L		06/25/15 15:57	06/29/15 13:30	1
2,4-Dinitrotoluene	ND		0.050	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
2-Methylphenol	ND		0.050	0.010	mg/L		06/25/15 15:57	06/29/15 13:30	1
3 & 4 Methylphenol	ND		0.10	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
Hexachlorobenzene	ND		0.050	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
Hexachlorobutadiene	ND		0.050	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
Hexachloroethane	ND		0.050	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
Nitrobenzene	ND		0.050	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
Pentachlorophenol	ND		0.25	0.010	mg/L		06/25/15 15:57	06/29/15 13:30	1
Pyridine	ND		0.10	0.025	mg/L		06/25/15 15:57	06/29/15 13:30	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*70*		*49 - 100*	*06/25/15 15:57*	*06/29/15 13:30*	*1*
2-Fluorobiphenyl (Surr)	*79*		*45 - 94*	*06/25/15 15:57*	*06/29/15 13:30*	*1*
2-Fluorophenol (Surr)	*68*		*46 - 92*	*06/25/15 15:57*	*06/29/15 13:30*	*1*
Nitrobenzene-d5 (Surr)	*81*		*51 - 98*	*06/25/15 15:57*	*06/29/15 13:30*	*1*
Phenol-d5 (Surr)	*56*		*37 - 95*	*06/25/15 15:57*	*06/29/15 13:30*	*1*
Terphenyl-d14 (Surr)	*72*		*60 - 113*	*06/25/15 15:57*	*06/29/15 13:30*	*1*

Lab Sample ID: LCS 160-197372/2-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197372

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dichlorobenzene	1.00	0.748		mg/L		75	36 - 93
2,4,5-Trichlorophenol	1.00	0.766		mg/L		77	49 - 96
2,4,6-Trichlorophenol	1.00	0.773		mg/L		77	48 - 93
2,4-Dinitrotoluene	1.00	0.686		mg/L		69	51 - 90
2-Methylphenol	1.00	0.685		mg/L		69	51 - 100
3 & 4 Methylphenol	1.00	0.580		mg/L		58	46 - 95
Hexachlorobenzene	1.00	0.793		mg/L		79	52 - 93
Hexachlorobutadiene	1.00	0.773		mg/L		77	37 - 92
Hexachloroethane	1.00	0.753		mg/L		75	36 - 95
Nitrobenzene	1.00	0.780		mg/L		78	51 - 93
Pentachlorophenol	1.00	0.573		mg/L		57	41 - 96

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 160-197372/2-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197372

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Pyridine			1.00	0.571		mg/L		57	10 - 80		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*73*		*49 - 100*
2-Fluorobiphenyl (Surr)	*79*		*45 - 94*
2-Fluorophenol (Surr)	*66*		*46 - 92*
Nitrobenzene-d5 (Surr)	*79*		*51 - 98*
Phenol-d5 (Surr)	*57*		*37 - 95*
Terphenyl-d14 (Surr)	*73*		*60 - 113*

Lab Sample ID: 160-12349-1 MS
Matrix: Water
Analysis Batch: 197753

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: TCLP
Prep Batch: 197372

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dichlorobenzene	ND		1.00	0.737		mg/L		74	46 - 88		
2,4,5-Trichlorophenol	ND		1.00	0.708		mg/L		71	52 - 98		
2,4,6-Trichlorophenol	ND		1.00	0.790		mg/L		79	52 - 94		
2,4-Dinitrotoluene	ND		1.00	0.611		mg/L		61	52 - 97		
2-Methylphenol	ND	F2 F1	1.00	0.527	F1	mg/L		53	55 - 97		
3 & 4 Methylphenol	0.44	J	1.00	1.17		mg/L		73	46 - 94		
Hexachlorobenzene	ND		1.00	0.724		mg/L		72	56 - 90		
Hexachlorobutadiene	ND		1.00	0.754		mg/L		75	43 - 92		
Hexachloroethane	ND		1.00	0.767		mg/L		77	44 - 91		
Nitrobenzene	ND		1.00	0.766		mg/L		77	53 - 97		
Pentachlorophenol	ND		1.00	0.600	J	mg/L		60	39 - 103		
Pyridine	ND	F1	1.00	ND	F1	mg/L		0	10 - 82		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*70*		*49 - 100*
2-Fluorobiphenyl (Surr)	*75*		*45 - 94*
2-Fluorophenol (Surr)	*52*		*46 - 92*
Nitrobenzene-d5 (Surr)	*107*	*X*	*51 - 98*
Phenol-d5 (Surr)	*13*	*X*	*37 - 95*
Terphenyl-d14 (Surr)	*65*		*60 - 113*

Lab Sample ID: 160-12349-1 MSD
Matrix: Water
Analysis Batch: 197753

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: TCLP
Prep Batch: 197372

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dichlorobenzene	ND		1.00	0.744		mg/L		74	46 - 88	1	20
2,4,5-Trichlorophenol	ND		1.00	0.687		mg/L		69	52 - 98	3	20
2,4,6-Trichlorophenol	ND		1.00	0.716		mg/L		72	52 - 94	10	20
2,4-Dinitrotoluene	ND		1.00	0.613		mg/L		61	52 - 97	0	20
2-Methylphenol	ND	F2 F1	1.00	0.337	F1 F2	mg/L		34	55 - 97	44	20
3 & 4 Methylphenol	0.44	J	1.00	0.970		mg/L		53	46 - 94	18	20
Hexachlorobenzene	ND		1.00	0.750		mg/L		75	56 - 90	4	20

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 160-12349-1 MSD
Matrix: Water
Analysis Batch: 197753

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: TCLP
Prep Batch: 197372

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hexachlorobutadiene	ND		1.00	0.773		mg/L		77	43 - 92	2	20
Hexachloroethane	ND		1.00	0.820		mg/L		82	44 - 91	7	20
Nitrobenzene	ND		1.00	0.806		mg/L		81	53 - 97	5	20
Pentachlorophenol	ND		1.00	0.585	J	mg/L		59	39 - 103	3	20
Pyridine	ND	F1	1.00	ND	F1	mg/L		0	10 - 82	NC	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*71*		*49 - 100*
2-Fluorobiphenyl (Surr)	*74*		*45 - 94*
2-Fluorophenol (Surr)	*50*		*46 - 92*
Nitrobenzene-d5 (Surr)	*104*	*X*	*51 - 98*
Phenol-d5 (Surr)	*16*	*X*	*37 - 95*
Terphenyl-d14 (Surr)	*65*		*60 - 113*

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: LCS 160-197348/2-A
Matrix: Water
Analysis Batch: 197511

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197348

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
gamma-BHC (Lindane)			0.00501	0.00557	*	mg/L		111	73 - 102		
Endrin			0.00501	0.00569	*	mg/L		114	77 - 107		
Heptachlor			0.00500	0.00554		mg/L		111	34 - 150		
Heptachlor epoxide			0.00500	0.00568	*	mg/L		114	73 - 99		
Methoxychlor			0.00500	0.00504		mg/L		101	80 - 115		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*74*		*43 - 131*
Tetrachloro-m-xylene	*98*		*44 - 115*

Lab Sample ID: LB 160-196535/1-D
Matrix: Water
Analysis Batch: 197511

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 197348

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
gamma-BHC (Lindane)	ND		0.00050	0.000015	mg/L		06/25/15 14:37	06/27/15 02:20	1
Endrin	ND		0.00050	0.000050	mg/L		06/25/15 14:37	06/27/15 02:20	1
Heptachlor	ND		0.00050	0.000015	mg/L		06/25/15 14:37	06/27/15 02:20	1
Heptachlor epoxide	ND		0.00050	0.000050	mg/L		06/25/15 14:37	06/27/15 02:20	1
Methoxychlor	ND		0.0010	0.000050	mg/L		06/25/15 14:37	06/27/15 02:20	1
Toxaphene	ND		0.020	0.000050	mg/L		06/25/15 14:37	06/27/15 02:20	1
Technical Chlordane	ND		0.0050	0.00020	mg/L		06/25/15 14:37	06/27/15 02:20	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*73*		*43 - 131*	*06/25/15 14:37*	*06/27/15 02:20*	*1*
Tetrachloro-m-xylene	*89*		*44 - 115*	*06/25/15 14:37*	*06/27/15 02:20*	*1*

Lab Sample ID: 160-12387-B-1-J MS
Matrix: Water
Analysis Batch: 197511

Client Sample ID: Matrix Spike
Prep Type: TCLP
Prep Batch: 197348

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
gamma-BHC (Lindane)	ND	* F1	0.00501	0.00636	F1	mg/L		127	68 - 109
Endrin	ND	* F1	0.00501	0.00576		mg/L		115	59 - 136
Heptachlor	ND		0.00500	0.00499	p	mg/L		100	34 - 150
Heptachlor epoxide	ND	* F1	0.00500	0.00537		mg/L		107	59 - 117
Methoxychlor	ND	F1 F2	0.00500	0.00465		mg/L		93	70 - 128

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*93*		*43 - 131*
Tetrachloro-m-xylene	*67*	*p*	*44 - 115*

Lab Sample ID: 160-12387-B-1-K MSD
Matrix: Water
Analysis Batch: 197511

Client Sample ID: Matrix Spike Duplicate
Prep Type: TCLP
Prep Batch: 197348

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
gamma-BHC (Lindane)	ND	* F1	0.00501	0.00744	F1	mg/L		149	68 - 109	16	20
Endrin	ND	* F1	0.00501	0.00702	F1	mg/L		140	59 - 136	20	20
Heptachlor	ND		0.00500	0.00579	p	mg/L		116	34 - 150	15	20
Heptachlor epoxide	ND	* F1	0.00500	0.00602	F1	mg/L		120	59 - 117	11	20
Methoxychlor	ND	F1 F2	0.00500	0.00656	F1 F2	mg/L		131	70 - 128	34	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*96*		*43 - 131*
Tetrachloro-m-xylene	*105*		*44 - 115*

Method: 8151A - Herbicides (GC)

Lab Sample ID: LB 160-197374/1-A
Matrix: Water
Analysis Batch: 197744

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197374

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	ND		0.040	0.020	mg/L		06/25/15 16:06	06/29/15 09:46	1
Silvex (2,4,5-TP)	ND		0.010	0.0030	mg/L		06/25/15 16:06	06/29/15 09:46	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*96*		*56 - 147*	*06/25/15 16:06*	*06/29/15 09:46*	*1*

Lab Sample ID: LCS 160-197374/2-A
Matrix: Water
Analysis Batch: 197744

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197374

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4-D	0.200	0.272		mg/L		136	46 - 140
Silvex (2,4,5-TP)	0.0500	0.0584		mg/L		117	42 - 140

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*129*		*56 - 147*

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: 160-12404-G-1-H MS
Matrix: Water
Analysis Batch: 197744

Client Sample ID: Matrix Spike
Prep Type: TCLP
Prep Batch: 197374

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4-D	0.093	F1 F2	0.200	0.199		mg/L		53	52 - 150
Silvex (2,4,5-TP)	ND	F1 F2	0.0500	0.0781	F1	mg/L		156	45 - 150

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*1035*	*X*	*56 - 147*

Lab Sample ID: 160-12404-G-1-I MSD
Matrix: Water
Analysis Batch: 197744

Client Sample ID: Matrix Spike Duplicate
Prep Type: TCLP
Prep Batch: 197374

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4-D	0.093	F1 F2	0.200	0.154	F1 F2	mg/L		30	52 - 150	26	20
Silvex (2,4,5-TP)	ND	F1 F2	0.0500	0.0583	F2	mg/L		117	45 - 150	29	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*788*	*X*	*56 - 147*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 160-196113/3
Matrix: Water
Analysis Batch: 196113

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	0.050	mg/L			06/17/15 19:17	1
Chloride	ND		0.20	0.020	mg/L			06/17/15 19:17	1

Lab Sample ID: LCS 160-196113/4
Matrix: Water
Analysis Batch: 196113

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	8.00	7.85		mg/L		98	90 - 110
Chloride	2.00	1.95		mg/L		98	90 - 110

Lab Sample ID: MB 160-196114/3
Matrix: Water
Analysis Batch: 196114

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.020	0.0040	mg/L			06/17/15 19:17	1
Nitrite as N	ND		0.020	0.0030	mg/L			06/17/15 19:17	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 160-196114/4
Matrix: Water
Analysis Batch: 196114

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.400	0.420		mg/L		105	90 - 110
Nitrite as N	0.160	0.169		mg/L		106	90 - 110

Lab Sample ID: MB 160-196118/9
Matrix: Water
Analysis Batch: 196118

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.20	0.020	mg/L			06/18/15 20:39	1

Lab Sample ID: LCS 160-196118/10
Matrix: Water
Analysis Batch: 196118

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.00	1.92		mg/L		96	90 - 110

Lab Sample ID: 160-12231-A-1 DU
Matrix: Water
Analysis Batch: 196118

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	1.8		1.79		mg/L		0.08	20

Method: 300.0 - Anions, Ion Chromatography - DL

Lab Sample ID: 160-12355-A-4 MS
Matrix: Water
Analysis Batch: 196113

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate - DL	14		8.00	21.7		mg/L		102	90 - 110

Lab Sample ID: 160-12355-A-4 DU
Matrix: Water
Analysis Batch: 196113

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfate - DL	14		13.5		mg/L		0.4	20

Lab Sample ID: 160-12355-A-4 MS
Matrix: Water
Analysis Batch: 196114

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N - DL	0.027	J F1	0.200	0.189	F1	mg/L		81	90 - 110

Method: 300.0 - Anions, Ion Chromatography - DL (Continued)

Lab Sample ID: 160-12355-A-4 DU
Matrix: Water
Analysis Batch: 196114

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Nitrite as N - DL	0.027	J F1		0.0246	J	mg/L				10	20

Lab Sample ID: 160-12231-A-11 MS
Matrix: Water
Analysis Batch: 196118

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride - DL	710		800	1560		mg/L		107	90 - 110		

Method: 300.0 - Anions, Ion Chromatography - DL3

Lab Sample ID: 160-12355-A-4 MS
Matrix: Water
Analysis Batch: 196114

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrate as N - DL3	50		80.0	137		mg/L		109	90 - 110		

Lab Sample ID: 160-12355-A-4 DU
Matrix: Water
Analysis Batch: 196114

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Nitrate as N - DL3	50			50.8		mg/L				1	20

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 160-196383/1-A
Matrix: Water
Analysis Batch: 197062

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 196383

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	3.7	ug/L		06/19/15 14:00	06/23/15 09:10	1
Arsenic	2.10	J	10	1.8	ug/L		06/19/15 14:00	06/23/15 09:10	1
Barium	ND		50	2.1	ug/L		06/19/15 14:00	06/23/15 09:10	1
Boron	ND		50	7.2	ug/L		06/19/15 14:00	06/23/15 09:10	1
Cadmium	ND		5.0	0.34	ug/L		06/19/15 14:00	06/23/15 09:10	1
Calcium	ND		1000	54	ug/L		06/19/15 14:00	06/23/15 09:10	1
Chromium	ND		10	3.4	ug/L		06/19/15 14:00	06/23/15 09:10	1
Copper	ND		25	2.1	ug/L		06/19/15 14:00	06/23/15 09:10	1
Iron	ND		100	13	ug/L		06/19/15 14:00	06/23/15 09:10	1
Lead	ND		10	0.60	ug/L		06/19/15 14:00	06/23/15 09:10	1
Magnesium	ND		1000	51	ug/L		06/19/15 14:00	06/23/15 09:10	1
Manganese	ND		15	1.0	ug/L		06/19/15 14:00	06/23/15 09:10	1
Molybdenum	ND		40	1.9	ug/L		06/19/15 14:00	06/23/15 09:10	1
Nickel	ND		40	2.6	ug/L		06/19/15 14:00	06/23/15 09:10	1
Potassium	ND		5000	460	ug/L		06/19/15 14:00	06/23/15 09:10	1
Selenium	ND		15	2.1	ug/L		06/19/15 14:00	06/23/15 09:10	1

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

Lab Sample ID: MB 160-196383/1-A
Matrix: Water
Analysis Batch: 197062

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 196383

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		10	0.99	ug/L		06/19/15 14:00	06/23/15 09:10	1
Sodium	ND		1000	110	ug/L		06/19/15 14:00	06/23/15 09:10	1
Sulfur	ND		5000	270	ug/L		06/19/15 14:00	06/23/15 09:10	1
Zinc	ND		20	8.3	ug/L		06/19/15 14:00	06/23/15 09:10	1

Lab Sample ID: MB 160-196383/1-A
Matrix: Water
Analysis Batch: 197326

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 196383

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Strontium	ND		5.0	0.24	ug/L		06/19/15 14:00	06/25/15 10:33	1

Lab Sample ID: LCS 160-196383/2-A
Matrix: Water
Analysis Batch: 197062

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196383

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	500	504		ug/L		101	80 - 120
Arsenic	1000	976		ug/L		98	80 - 120
Barium	1000	998		ug/L		100	80 - 120
Boron	2000	1940		ug/L		97	80 - 120
Cadmium	1000	1000		ug/L		100	80 - 120
Calcium	10000	10900		ug/L		109	80 - 120
Chromium	1000	1070		ug/L		107	80 - 120
Copper	1000	1050		ug/L		105	80 - 120
Iron	10000	9980		ug/L		100	80 - 120
Lead	1000	1050		ug/L		105	80 - 120
Magnesium	10000	9150		ug/L		92	80 - 120
Manganese	1000	975		ug/L		97	80 - 120
Molybdenum	500	535		ug/L		107	80 - 120
Nickel	1000	1070		ug/L		107	80 - 120
Potassium	10000	9750		ug/L		97	80 - 120
Selenium	500	495		ug/L		99	80 - 120
Silver	200	215		ug/L		107	80 - 120
Sodium	10000	9980		ug/L		100	80 - 120
Sulfur	10000	9970		ug/L		100	80 - 120
Zinc	1000	1020		ug/L		102	80 - 120

Lab Sample ID: LCS 160-196383/2-A
Matrix: Water
Analysis Batch: 197326

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196383

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Strontium	1000	1020		ug/L		102	80 - 120

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

Lab Sample ID: 160-12251-F-1-B MS
Matrix: Water
Analysis Batch: 197062

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 196383

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		500	570		ug/L		114	75 - 125
Arsenic	140	J B	1000	1180		ug/L		104	75 - 125
Barium	ND		1000	1040		ug/L		104	75 - 125
Boron	2900		2000	5010		ug/L		105	75 - 125
Cadmium	16	J	1000	1060		ug/L		105	75 - 125
Calcium	660000		10000	705000	4	ug/L		426	75 - 125
Chromium	ND		1000	1140		ug/L		114	75 - 125
Copper	ND		1000	1070		ug/L		107	75 - 125
Iron	ND		10000	10700		ug/L		107	75 - 125
Lead	20	J	1000	1100		ug/L		108	75 - 125
Magnesium	250000		10000	273000	4	ug/L		220	75 - 125
Manganese	ND		1000	1040		ug/L		104	75 - 125
Molybdenum	700	J	500	1280		ug/L		116	75 - 125
Nickel	ND		1000	1140		ug/L		114	75 - 125
Potassium	35000	J F1	10000	47700	J	ug/L		122	75 - 125
Selenium	130	J	500	680		ug/L		110	75 - 125
Silver	ND		200	224		ug/L		112	75 - 125
Sodium	760000		10000	814000	4	ug/L		506	75 - 125
Sulfur	950000		10000	1010000	4	ug/L		590	75 - 125
Zinc	ND		1000	1170		ug/L		117	75 - 125

Lab Sample ID: 160-12251-F-1-B MS
Matrix: Water
Analysis Batch: 197326

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 196383

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Strontium	10000		1000	5510	4	ug/L		-452	75 - 125

Lab Sample ID: 160-12251-F-1-C MSD
Matrix: Water
Analysis Batch: 197062

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 196383

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		500	512		ug/L		102	75 - 125	11	20
Arsenic	140	J B	1000	1100		ug/L		96	75 - 125	7	20
Barium	ND		1000	936	J	ug/L		94	75 - 125	10	20
Boron	2900		2000	4490		ug/L		79	75 - 125	11	20
Cadmium	16	J	1000	994		ug/L		98	75 - 125	7	20
Calcium	660000		10000	651000	4	ug/L		-110	75 - 125	8	20
Chromium	ND		1000	1030		ug/L		103	75 - 125	10	20
Copper	ND		1000	1030		ug/L		103	75 - 125	4	20
Iron	ND		10000	9610		ug/L		96	75 - 125	10	20
Lead	20	J	1000	1040		ug/L		102	75 - 125	6	20
Magnesium	250000		10000	242000	4	ug/L		-90	75 - 125	12	20
Manganese	ND		1000	930		ug/L		93	75 - 125	11	20
Molybdenum	700	J	500	1190		ug/L		98	75 - 125	7	20
Nickel	ND		1000	1060		ug/L		106	75 - 125	7	20
Potassium	35000	J F1	10000	42000	J F1	ug/L		65	75 - 125	13	20

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

Lab Sample ID: 160-12251-F-1-C MSD
Matrix: Water
Analysis Batch: 197062

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 196383

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Selenium	130	J	500	578		ug/L		90	75 - 125	16	20
Silver	ND		200	220		ug/L		110	75 - 125	2	20
Sodium	760000		10000	719000	4	ug/L		-448	75 - 125	12	20
Sulfur	950000		10000	922000	4	ug/L		-240	75 - 125	9	20
Zinc	ND		1000	1120		ug/L		112	75 - 125	4	20

Lab Sample ID: 160-12251-F-1-C MSD
Matrix: Water
Analysis Batch: 197326

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 196383

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Strontium	10000		1000	5730	4	ug/L		-431	75 - 125	4	20

Lab Sample ID: LCS 160-196390/2-A
Matrix: Water
Analysis Batch: 196829

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196390

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	2.50	2.35		mg/L		94	80 - 120
Barium	2.50	2.44		mg/L		98	80 - 120
Cadmium	2.50	2.40		mg/L		96	80 - 120
Chromium	2.50	2.54		mg/L		102	80 - 120
Lead	2.50	2.64		mg/L		106	80 - 120
Selenium	1.25	1.27		mg/L		102	80 - 120
Silver	0.500	0.519		mg/L		104	80 - 120

Lab Sample ID: LB 160-196046/1-D
Matrix: Water
Analysis Batch: 196829

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 196390

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.0045	mg/L		06/19/15 14:30	06/22/15 14:12	1
Barium	ND		0.13	0.0053	mg/L		06/19/15 14:30	06/22/15 14:12	1
Cadmium	ND		0.013	0.00084	mg/L		06/19/15 14:30	06/22/15 14:12	1
Chromium	ND		0.025	0.0084	mg/L		06/19/15 14:30	06/22/15 14:12	1
Lead	ND		0.25	0.0015	mg/L		06/19/15 14:30	06/22/15 14:12	1
Selenium	0.00525	J	0.50	0.0052	mg/L		06/19/15 14:30	06/22/15 14:12	1
Silver	ND		0.025	0.0025	mg/L		06/19/15 14:30	06/22/15 14:12	1

Lab Sample ID: 160-12349-1 MS
Matrix: Water
Analysis Batch: 196829

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: TCLP
Prep Batch: 196390

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	ND		2.50	2.73	J	mg/L		109	75 - 125
Barium	ND	F1 F2	2.50	3.23	J F1	mg/L		129	75 - 125
Cadmium	0.088	J	2.50	2.56		mg/L		99	75 - 125
Chromium	4.9	F1	2.50	5.38	F1	mg/L		19	75 - 125
Lead	0.088	J	2.50	2.74	J	mg/L		106	75 - 125

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

Lab Sample ID: 160-12349-1 MS
Matrix: Water
Analysis Batch: 196829

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: TCLP
Prep Batch: 196390

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Selenium	0.39	J B	1.25	1.51	J	mg/L		90	75 - 125
Silver	ND	F1	0.500	0.588	J	mg/L		118	75 - 125

Lab Sample ID: 160-12349-1 MSD
Matrix: Water
Analysis Batch: 196829

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: TCLP
Prep Batch: 196390

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		2.50	2.60	J	mg/L		104	75 - 125	5	20
Barium	ND	F1 F2	2.50	2.50	J F2	mg/L		100	75 - 125	25	20
Cadmium	0.088	J	2.50	2.51		mg/L		97	75 - 125	2	20
Chromium	4.9	F1	2.50	5.09	F1	mg/L		8	75 - 125	5	20
Lead	0.088	J	2.50	2.61	J	mg/L		101	75 - 125	5	20
Selenium	0.39	J B	1.25	1.58	J	mg/L		95	75 - 125	4	20
Silver	ND	F1	0.500	0.638	J F1	mg/L		128	75 - 125	8	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LCS 160-196276/2-A
Matrix: Water
Analysis Batch: 196521

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196276

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.0250	0.0254		mg/L		102	80 - 120

Lab Sample ID: MB 160-196278/1-A
Matrix: Water
Analysis Batch: 196521

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 196278

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.060	ug/L		06/19/15 09:26	06/19/15 16:28	1

Lab Sample ID: LCS 160-196278/2-A
Matrix: Water
Analysis Batch: 196521

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196278

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.91		ug/L		98	80 - 120

Lab Sample ID: 160-12355-G-7-B MS
Matrix: Water
Analysis Batch: 196521

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 196278

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.3		5.00	9.78		ug/L		90	80 - 120

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 160-12355-G-7-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 196521 — **Prep Batch: 196278**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.3		5.00	9.78		ug/L		90	80 - 120	0	20

Lab Sample ID: LB 160-196046/1-B — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: TCLP**
Analysis Batch: 196521 — **Prep Batch: 196276**

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0010	0.000079	mg/L		06/19/15 09:23	06/19/15 16:17	1

Lab Sample ID: 160-12349-1 MS — **Client Sample ID: SCRUBBER TEST 6-16**
Matrix: Water — **Prep Type: TCLP**
Analysis Batch: 196521 — **Prep Batch: 196276**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.0033		0.0250	0.0280		mg/L		99	70 - 130

Lab Sample ID: 160-12349-1 MSD — **Client Sample ID: SCRUBBER TEST 6-16**
Matrix: Water — **Prep Type: TCLP**
Analysis Batch: 196521 — **Prep Batch: 196276**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.0033		0.0250	0.0280		mg/L		99	70 - 130	0	20

Method: 1664A - HEM and SGT-HEM

Lab Sample ID: MB 490-258986/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 258988 — **Prep Batch: 258986**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fats, Oils or Grease	ND		4.0	1.4	mg/L		06/24/15 11:37	06/24/15 11:37	1

Lab Sample ID: LCS 490-258986/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 258988 — **Prep Batch: 258986**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fats, Oils or Grease	41.7	38.3		mg/L		92	78 - 114

Lab Sample ID: 490-80654-J-1-A MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 258988 — **Prep Batch: 258986**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fats, Oils or Grease	ND		41.7	35.3		mg/L		85	78 - 114

Method: 335.4 - Cyanide, Total

Lab Sample ID: MB 490-259159/1-A
Matrix: Water
Analysis Batch: 259402

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 259159

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		0.010	0.0070	mg/L		06/24/15 18:03	06/25/15 09:47	1

Lab Sample ID: LCS 490-259159/2-A
Matrix: Water
Analysis Batch: 259402

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 259159

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.100	0.0970		mg/L		97	90 - 110

Lab Sample ID: LCSD 490-259159/3-A
Matrix: Water
Analysis Batch: 259402

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 259159

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cyanide, Total	0.100	0.0966		mg/L		97	90 - 110	0	20

Lab Sample ID: 460-96707-A-2-B MS
Matrix: Water
Analysis Batch: 259402

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 259159

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	ND	F1	0.100	ND	F1	mg/L		0	90 - 110

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 490-257655/1-A
Matrix: Water
Analysis Batch: 258504

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 257655

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.10	0.060	mg/L		06/19/15 10:50	06/22/15 11:40	1

Lab Sample ID: LCS 490-257655/2-A
Matrix: Water
Analysis Batch: 258504

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 257655

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	5.00	5.22		mg/L		104	90 - 110

Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 490-258815/1-A
Matrix: Water
Analysis Batch: 259047

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 258815

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Kjeldahl Nitrogen as N	0.0780	J	0.25	0.060	mg/L		06/23/15 20:35	06/24/15 10:40	1

Method: 351.2 - Nitrogen, Total Kjeldahl (Continued)

Lab Sample ID: LCS 490-258815/2-A
Matrix: Water
Analysis Batch: 259047

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 258815

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	2.50	2.48		mg/L		99	90 - 110

Lab Sample ID: 490-80729-E-2-D MS
Matrix: Water
Analysis Batch: 259047

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 258815

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	1.3	F2 F1 B	2.50	4.10	F1	mg/L		111	90 - 110

Lab Sample ID: 490-80729-E-2-E MSD
Matrix: Water
Analysis Batch: 259047

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 258815

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Kjeldahl Nitrogen as N	1.3	F2 F1 B	2.50	3.30	F1 F2	mg/L		79	90 - 110	22	20

Lab Sample ID: 590-1066-C-2-B MS
Matrix: Water
Analysis Batch: 259047

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 258815

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	7.0	B F1	2.50	10.1	F1	mg/L		124	90 - 110

Lab Sample ID: 590-1066-C-2-C MSD
Matrix: Water
Analysis Batch: 259047

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 258815

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Kjeldahl Nitrogen as N	7.0	B F1	2.50	9.83	F1	mg/L		115	90 - 110	2	20

Method: 365.4 - Phosphorus, Total

Lab Sample ID: MB 490-259884/1-A
Matrix: Water
Analysis Batch: 260520

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 259884

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.10	0.050	mg/L		06/26/15 17:17	06/28/15 12:34	1

Lab Sample ID: LCS 490-259884/2-A
Matrix: Water
Analysis Batch: 260520

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 259884

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	2.00	2.07		mg/L		104	90 - 110

Method: 365.4 - Phosphorus, Total (Continued)

Lab Sample ID: 490-80729-E-2-G MS
Matrix: Water
Analysis Batch: 260520

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 259884

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	0.15	F1 F2	2.00	0.428	F1	mg/L		14	73 - 119

Lab Sample ID: 490-80729-E-2-H MSD
Matrix: Water
Analysis Batch: 260520

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 259884

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phosphorus, Total	0.15	F1 F2	2.00	0.560	F1 F2	mg/L		21	73 - 119	27	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-258218/2
Matrix: Water
Analysis Batch: 258218

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	ND		10	5.0	mg/L			06/19/15 16:44	1
Alkalinity	ND		10	5.0	mg/L			06/19/15 16:44	1

Lab Sample ID: LCS 490-258218/3
Matrix: Water
Analysis Batch: 258218

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	92.0		mg/L		92	90 - 110

Lab Sample ID: 160-12349-1 DU
Matrix: Water
Analysis Batch: 258218

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Bicarbonate Alkalinity as CaCO3	ND		ND		mg/L		NC	20
Alkalinity	ND		ND		mg/L		NC	20

Lab Sample ID: 490-80791-G-5 DU
Matrix: Water
Analysis Batch: 258218

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Bicarbonate Alkalinity as CaCO3	360		364		mg/L		0.07	20
Alkalinity	360		364		mg/L		0.07	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 490-260148/1
Matrix: Water
Analysis Batch: 260148

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	7.0	mg/L			06/27/15 15:27	1

Lab Sample ID: LCS 490-260148/2
Matrix: Water
Analysis Batch: 260148

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	99.9	95.0		mg/L		95	90 - 110

Lab Sample ID: LCSD 490-260148/3
Matrix: Water
Analysis Batch: 260148

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids	99.9	97.0		mg/L		97	90 - 110	2	20

Lab Sample ID: 490-80902-Q-1 DU
Matrix: Water
Analysis Batch: 260148

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	7200		8090		mg/L		12	20

Lab Sample ID: 490-81525-M-1 DU
Matrix: Water
Analysis Batch: 260148

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	5200		5090		mg/L		2	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 490-261237/1
Matrix: Water
Analysis Batch: 261237

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.0	0.70	mg/L			07/01/15 13:53	1

Lab Sample ID: LCS 490-261237/2
Matrix: Water
Analysis Batch: 261237

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	100		mg/L		100	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: 160-12349-1 DU
Matrix: Water
Analysis Batch: 261237

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	930	H		516	F3	mg/L				58	20

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 490-260593/1
Matrix: Water
Analysis Batch: 260593

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.10	0.040	mg/L			06/29/15 15:48	1

Lab Sample ID: LCS 490-260593/2
Matrix: Water
Analysis Batch: 260593

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chlorine, Total Residual			0.200	0.196		mg/L		98	85 - 115		

Lab Sample ID: 160-12349-1 DU
Matrix: Water
Analysis Batch: 260593

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	0.42	HF		0.458		mg/L				10	20

Method: SM 4500 H+ B - pH

Lab Sample ID: 490-80772-A-1 DU
Matrix: Water
Analysis Batch: 257768

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.37			7.370		SU				0	20

Method: SM 4500 S2 F - Sulfide, Total

Lab Sample ID: MB 490-258105/2
Matrix: Water
Analysis Batch: 258105

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Sulfide	ND		1.0	0.50	mg/L			06/21/15 23:30	1

Method: SM 4500 S2 F - Sulfide, Total (Continued)

Lab Sample ID: LCS 490-258105/3
Matrix: Water
Analysis Batch: 258105

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Sulfide			20.0	20.9		mg/L		104	90 - 110		

Lab Sample ID: 160-12349-1 MS
Matrix: Water
Analysis Batch: 258105

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Sulfide	43	F1	20.0	74.6	F1	mg/L		158	70 - 130		

Lab Sample ID: 160-12349-1 MSD
Matrix: Water
Analysis Batch: 258105

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Sulfide	43	F1	20.0	73.0	F1	mg/L		150	70 - 130	2	10

Lab Sample ID: 160-12349-1 DU
Matrix: Water
Analysis Batch: 258105

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Sulfide	43	F1		42.3		mg/L				2	20

Lab Sample ID: MB 490-258769/2
Matrix: Water
Analysis Batch: 258769

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide, Dissolved	ND		1.0	0.50	mg/L			06/23/15 17:09	1

Lab Sample ID: LCS 490-258769/3
Matrix: Water
Analysis Batch: 258769

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfide, Dissolved			20.0	19.8		mg/L		99	90 - 110		

Lab Sample ID: 160-12349-1 MS
Matrix: Water
Analysis Batch: 258769

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfide, Dissolved	22	F1	20.0	36.9		mg/L		72	70 - 130		

Lab Sample ID: 160-12349-1 MSD
Matrix: Water
Analysis Batch: 258769

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfide, Dissolved	22	F1	20.0	35.5	F1	mg/L		65	70 - 130	4	10

Lab Sample ID: 160-12349-1 DU
Matrix: Water
Analysis Batch: 258769

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfide, Dissolved	22	F1	16.9	F3	mg/L		28	20

Method: SM 4500 SO3 B - Sulfite

Lab Sample ID: MB 490-260237/1
Matrix: Water
Analysis Batch: 260237

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfite	ND		5.0	2.5	mg/L			06/28/15 11:13	1

Lab Sample ID: LCS 490-260237/2
Matrix: Water
Analysis Batch: 260237

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfite	19.9	20.4		mg/L		102	90 - 110

Lab Sample ID: 160-12349-1 MS
Matrix: Water
Analysis Batch: 260237

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfite	31	HF	19.9	51.6		mg/L		104	80 - 120

Lab Sample ID: 160-12349-1 MSD
Matrix: Water
Analysis Batch: 260237

Client Sample ID: SCRUBBER TEST 6-16
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfite	31	HF	19.9	50.8		mg/L		100	80 - 120	2	20

Lab Sample ID: 490-80720-G-1 DU
Matrix: Water
Analysis Batch: 260237

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfite	10		10.4		mg/L		0	20

Method: SM 5220D - COD

Lab Sample ID: MB 490-257786/3
Matrix: Water
Analysis Batch: 257786

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	6.47	J	20	4.0	mg/L			06/19/15 15:13	1

Method: SM 5220D - COD (Continued)

Lab Sample ID: LCS 490-257786/4
Matrix: Water
Analysis Batch: 257786

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chemical Oxygen Demand			50.0	48.7		mg/L		97	95 - 105		

Lab Sample ID: LCSD 490-257786/5
Matrix: Water
Analysis Batch: 257786

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chemical Oxygen Demand			50.0	50.1		mg/L		100	95 - 105	3	20

Lab Sample ID: 490-80765-F-1 MS
Matrix: Water
Analysis Batch: 257786

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chemical Oxygen Demand	57	F1 B	50.0	97.4	F1	mg/L		80	95 - 105		

Lab Sample ID: 490-80765-F-1 MSD
Matrix: Water
Analysis Batch: 257786

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chemical Oxygen Demand	57	F1 B	50.0	92.8	F1	mg/L		71	95 - 105	5	20

Lab Sample ID: 490-80803-D-1 DU
Matrix: Water
Analysis Batch: 257786

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chemical Oxygen Demand	35	B	37.2		mg/L		5	20

Method: SM5210B - BOD, 5 Day

Lab Sample ID: MB 490-258518/3
Matrix: Water
Analysis Batch: 258518

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Biochemical Oxygen Demand	ND		2.0	2.0	mg/L			06/18/15 14:50	1

Lab Sample ID: LCS 490-258518/2
Matrix: Water
Analysis Batch: 258518

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Biochemical Oxygen Demand			3.96	4.23		mg/L		107	85 - 115		

Method: SM5210B - BOD, 5 Day (Continued)

Lab Sample ID: 490-80750-A-1 DU
Matrix: Water
Analysis Batch: 258518

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Biochemical Oxygen Demand	18000	b		17800		mg/L				2	20

GC/MS VOA

Analysis Batch: 196001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	8260C	196022
160-12349-1 MS	SCRUBBER TEST 6-16	TCLP	Water	8260C	196022
160-12349-1 MSD	SCRUBBER TEST 6-16	TCLP	Water	8260C	196022
LB 160-196022/1-A	Method Blank	TCLP	Water	8260C	196022
LCS 160-196001/12	Lab Control Sample	Total/NA	Water	8260C	

Leach Batch: 196022

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	1311	
160-12349-1 MS	SCRUBBER TEST 6-16	TCLP	Water	1311	
160-12349-1 MSD	SCRUBBER TEST 6-16	TCLP	Water	1311	
LB 160-196022/1-A	Method Blank	TCLP	Water	1311	

Analysis Batch: 196251

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	8260C	196022

Analysis Batch: 197153

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1 - DL	SCRUBBER TEST 6-16	Total/NA	Water	8260C	
160-12349-1 - DL2	SCRUBBER TEST 6-16	Total/NA	Water	8260C	
LCS 160-197153/10	Lab Control Sample	Total/NA	Water	8260C	
LCSD 160-197153/11	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 160-197153/13	Method Blank	Total/NA	Water	8260C	

GC/MS Semi VOA

Leach Batch: 196046

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	1311	
160-12349-1 MS	SCRUBBER TEST 6-16	TCLP	Water	1311	
160-12349-1 MSD	SCRUBBER TEST 6-16	TCLP	Water	1311	

Prep Batch: 196049

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12274-I-1-A MS	Matrix Spike	Total/NA	Water	3510C	
160-12274-J-1-A MSD	Matrix Spike Duplicate	Total/NA	Water	3510C	
160-12349-1 - DL	SCRUBBER TEST 6-16	Total/NA	Water	3510C	
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	3510C	
LCS 160-196049/2-A	Lab Control Sample	Total/NA	Water	3510C	
MB 160-196049/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 196110

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12274-I-1-A MS	Matrix Spike	Total/NA	Water	8270D	196049
160-12274-J-1-A MSD	Matrix Spike Duplicate	Total/NA	Water	8270D	196049
LCS 160-196049/2-A	Lab Control Sample	Total/NA	Water	8270D	196049
MB 160-196049/1-A	Method Blank	Total/NA	Water	8270D	196049

GC/MS Semi VOA (Continued)

Prep Batch: 197372

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	3510C	196046
160-12349-1 MS	SCRUBBER TEST 6-16	TCLP	Water	3510C	196046
160-12349-1 MSD	SCRUBBER TEST 6-16	TCLP	Water	3510C	196046
LB 160-197372/1-A	Method Blank	Total/NA	Water	3510C	
LCS 160-197372/2-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 197753

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	8270D	197372
160-12349-1 - DL	SCRUBBER TEST 6-16	Total/NA	Water	8270D	196049
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	8270D	196049
160-12349-1 MS	SCRUBBER TEST 6-16	TCLP	Water	8270D	197372
160-12349-1 MSD	SCRUBBER TEST 6-16	TCLP	Water	8270D	197372
LB 160-197372/1-A	Method Blank	Total/NA	Water	8270D	197372
LCS 160-197372/2-A	Lab Control Sample	Total/NA	Water	8270D	197372

GC Semi VOA

Leach Batch: 196046

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	1311	

Leach Batch: 196535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12387-B-1-J MS	Matrix Spike	TCLP	Water	1311	
160-12387-B-1-K MSD	Matrix Spike Duplicate	TCLP	Water	1311	
160-12404-G-1-H MS	Matrix Spike	TCLP	Water	1311	
160-12404-G-1-I MSD	Matrix Spike Duplicate	TCLP	Water	1311	
LB 160-196535/1-D	Method Blank	TCLP	Water	1311	

Prep Batch: 197348

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	3510C	196046
160-12387-B-1-J MS	Matrix Spike	TCLP	Water	3510C	196535
160-12387-B-1-K MSD	Matrix Spike Duplicate	TCLP	Water	3510C	196535
LB 160-196535/1-D	Method Blank	TCLP	Water	3510C	196535
LCS 160-197348/2-A	Lab Control Sample	Total/NA	Water	3510C	

Prep Batch: 197374

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	8151A	196046
160-12404-G-1-H MS	Matrix Spike	TCLP	Water	8151A	196535
160-12404-G-1-I MSD	Matrix Spike Duplicate	TCLP	Water	8151A	196535
LB 160-197374/1-A	Method Blank	Total/NA	Water	8151A	
LCS 160-197374/2-A	Lab Control Sample	Total/NA	Water	8151A	

Analysis Batch: 197511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	8081B	197348
160-12387-B-1-J MS	Matrix Spike	TCLP	Water	8081B	197348

GC Semi VOA (Continued)

Analysis Batch: 197511 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12387-B-1-K MSD	Matrix Spike Duplicate	TCLP	Water	8081B	197348
LB 160-196535/1-D	Method Blank	TCLP	Water	8081B	197348
LCS 160-197348/2-A	Lab Control Sample	Total/NA	Water	8081B	197348

Analysis Batch: 197744

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	8151A	197374
160-12404-G-1-H MS	Matrix Spike	TCLP	Water	8151A	197374
160-12404-G-1-I MSD	Matrix Spike Duplicate	TCLP	Water	8151A	197374
LB 160-197374/1-A	Method Blank	Total/NA	Water	8151A	197374
LCS 160-197374/2-A	Lab Control Sample	Total/NA	Water	8151A	197374

HPLC/IC

Analysis Batch: 196113

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1 - DL	SCRUBBER TEST 6-16	Total/NA	Water	300.0	
160-12355-A-4 DU - DL	Duplicate	Total/NA	Water	300.0	
160-12355-A-4 MS - DL	Matrix Spike	Total/NA	Water	300.0	
LCS 160-196113/4	Lab Control Sample	Total/NA	Water	300.0	
MB 160-196113/3	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 196114

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1 - DL2	SCRUBBER TEST 6-16	Total/NA	Water	300.0	
160-12349-1 - DL3	SCRUBBER TEST 6-16	Total/NA	Water	300.0	
160-12355-A-4 DU - DL	Duplicate	Total/NA	Water	300.0	
160-12355-A-4 DU - DL3	Duplicate	Total/NA	Water	300.0	
160-12355-A-4 MS - DL	Matrix Spike	Total/NA	Water	300.0	
160-12355-A-4 MS - DL3	Matrix Spike	Total/NA	Water	300.0	
LCS 160-196114/4	Lab Control Sample	Total/NA	Water	300.0	
MB 160-196114/3	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 196118

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12231-A-1 DU	Duplicate	Total/NA	Water	300.0	
160-12231-A-11 MS - DL	Matrix Spike	Total/NA	Water	300.0	
160-12349-1 - RADL	SCRUBBER TEST 6-16	Total/NA	Water	300.0	
LCS 160-196118/10	Lab Control Sample	Total/NA	Water	300.0	
MB 160-196118/9	Method Blank	Total/NA	Water	300.0	

Metals

Leach Batch: 196046

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	1311	
160-12349-1 MS	SCRUBBER TEST 6-16	TCLP	Water	1311	
160-12349-1 MSD	SCRUBBER TEST 6-16	TCLP	Water	1311	
LB 160-196046/1-B	Method Blank	TCLP	Water	1311	
LB 160-196046/1-D	Method Blank	TCLP	Water	1311	

Metals (Continued)

Prep Batch: 196276

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	7470A	196046
160-12349-1 MS	SCRUBBER TEST 6-16	TCLP	Water	7470A	196046
160-12349-1 MSD	SCRUBBER TEST 6-16	TCLP	Water	7470A	196046
LB 160-196046/1-B	Method Blank	TCLP	Water	7470A	196046
LCS 160-196276/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 196278

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	7470A	
160-12355-G-7-B MS	Matrix Spike	Total/NA	Water	7470A	
160-12355-G-7-C MSD	Matrix Spike Duplicate	Total/NA	Water	7470A	
LCS 160-196278/2-A	Lab Control Sample	Total/NA	Water	7470A	
MB 160-196278/1-A	Method Blank	Total/NA	Water	7470A	

Prep Batch: 196383

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12251-F-1-B MS	Matrix Spike	Total/NA	Water	3010A	
160-12251-F-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	3010A	
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	3010A	
LCS 160-196383/2-A	Lab Control Sample	Total/NA	Water	3010A	
MB 160-196383/1-A	Method Blank	Total/NA	Water	3010A	

Prep Batch: 196390

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	3010A	196046
160-12349-1 MS	SCRUBBER TEST 6-16	TCLP	Water	3010A	196046
160-12349-1 MSD	SCRUBBER TEST 6-16	TCLP	Water	3010A	196046
LB 160-196046/1-D	Method Blank	TCLP	Water	3010A	196046
LCS 160-196390/2-A	Lab Control Sample	Total/NA	Water	3010A	

Analysis Batch: 196521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	7470A	196276
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	7470A	196278
160-12349-1 MS	SCRUBBER TEST 6-16	TCLP	Water	7470A	196276
160-12349-1 MSD	SCRUBBER TEST 6-16	TCLP	Water	7470A	196276
160-12355-G-7-B MS	Matrix Spike	Total/NA	Water	7470A	196278
160-12355-G-7-C MSD	Matrix Spike Duplicate	Total/NA	Water	7470A	196278
LB 160-196046/1-B	Method Blank	TCLP	Water	7470A	196276
LCS 160-196276/2-A	Lab Control Sample	Total/NA	Water	7470A	196276
LCS 160-196278/2-A	Lab Control Sample	Total/NA	Water	7470A	196278
MB 160-196278/1-A	Method Blank	Total/NA	Water	7470A	196278

Analysis Batch: 196829

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	TCLP	Water	6010C	196390
160-12349-1 MS	SCRUBBER TEST 6-16	TCLP	Water	6010C	196390
160-12349-1 MSD	SCRUBBER TEST 6-16	TCLP	Water	6010C	196390
LB 160-196046/1-D	Method Blank	TCLP	Water	6010C	196390
LCS 160-196390/2-A	Lab Control Sample	Total/NA	Water	6010C	196390

Metals (Continued)

Analysis Batch: 197062

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12251-F-1-B MS	Matrix Spike	Total/NA	Water	6010C	196383
160-12251-F-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	6010C	196383
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	6010C	196383
LCS 160-196383/2-A	Lab Control Sample	Total/NA	Water	6010C	196383
MB 160-196383/1-A	Method Blank	Total/NA	Water	6010C	196383

Analysis Batch: 197326

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12251-F-1-B MS	Matrix Spike	Total/NA	Water	6010C	196383
160-12251-F-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	6010C	196383
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	6010C	196383
LCS 160-196383/2-A	Lab Control Sample	Total/NA	Water	6010C	196383
MB 160-196383/1-A	Method Blank	Total/NA	Water	6010C	196383

General Chemistry

Prep Batch: 257655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	Distill/Ammonia	
LCS 490-257655/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 490-257655/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 257768

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 H+ B	
490-80772-A-1 DU	Duplicate	Total/NA	Water	SM 4500 H+ B	
LCS 490-257768/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 257786

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	SM 5220D	
490-80765-F-1 MS	Matrix Spike	Total/NA	Water	SM 5220D	
490-80765-F-1 MSD	Matrix Spike Duplicate	Total/NA	Water	SM 5220D	
490-80803-D-1 DU	Duplicate	Total/NA	Water	SM 5220D	
LCS 490-257786/4	Lab Control Sample	Total/NA	Water	SM 5220D	
LCSD 490-257786/5	Lab Control Sample Dup	Total/NA	Water	SM 5220D	
MB 490-257786/3	Method Blank	Total/NA	Water	SM 5220D	

Analysis Batch: 258105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 S2 F	
160-12349-1 DU	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 S2 F	
160-12349-1 MS	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 S2 F	
160-12349-1 MSD	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 S2 F	
LCS 490-258105/3	Lab Control Sample	Total/NA	Water	SM 4500 S2 F	
MB 490-258105/2	Method Blank	Total/NA	Water	SM 4500 S2 F	

Analysis Batch: 258218

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	SM 2320B	

General Chemistry (Continued)

Analysis Batch: 258218 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1 DU	SCRUBBER TEST 6-16	Total/NA	Water	SM 2320B	
490-80791-G-5 DU	Duplicate	Total/NA	Water	SM 2320B	
LCS 490-258218/3	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 490-258218/2	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 258504

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	350.1	257655
LCS 490-257655/2-A	Lab Control Sample	Total/NA	Water	350.1	257655
MB 490-257655/1-A	Method Blank	Total/NA	Water	350.1	257655

Analysis Batch: 258518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	SM5210B	
490-80750-A-1 DU	Duplicate	Total/NA	Water	SM5210B	
LCS 490-258518/2	Lab Control Sample	Total/NA	Water	SM5210B	
MB 490-258518/3	Method Blank	Total/NA	Water	SM5210B	

Analysis Batch: 258769

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 S2 F	
160-12349-1 DU	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 S2 F	
160-12349-1 MS	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 S2 F	
160-12349-1 MSD	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 S2 F	
LCS 490-258769/3	Lab Control Sample	Total/NA	Water	SM 4500 S2 F	
MB 490-258769/2	Method Blank	Total/NA	Water	SM 4500 S2 F	

Prep Batch: 258815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	351.2	
490-80729-E-2-D MS	Matrix Spike	Total/NA	Water	351.2	
490-80729-E-2-E MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	
590-1066-C-2-B MS	Matrix Spike	Total/NA	Water	351.2	
590-1066-C-2-C MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	
LCS 490-258815/2-A	Lab Control Sample	Total/NA	Water	351.2	
MB 490-258815/1-A	Method Blank	Total/NA	Water	351.2	

Prep Batch: 258986

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	1664A	
490-80654-J-1-A MS	Matrix Spike	Total/NA	Water	1664A	
LCS 490-258986/2-A	Lab Control Sample	Total/NA	Water	1664A	
MB 490-258986/1-A	Method Blank	Total/NA	Water	1664A	

Analysis Batch: 258988

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	1664A	258986
490-80654-J-1-A MS	Matrix Spike	Total/NA	Water	1664A	258986
LCS 490-258986/2-A	Lab Control Sample	Total/NA	Water	1664A	258986
MB 490-258986/1-A	Method Blank	Total/NA	Water	1664A	258986

General Chemistry (Continued)

Analysis Batch: 259047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	351.2	258815
490-80729-E-2-D MS	Matrix Spike	Total/NA	Water	351.2	258815
490-80729-E-2-E MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	258815
590-1066-C-2-B MS	Matrix Spike	Total/NA	Water	351.2	258815
590-1066-C-2-C MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	258815
LCS 490-258815/2-A	Lab Control Sample	Total/NA	Water	351.2	258815
MB 490-258815/1-A	Method Blank	Total/NA	Water	351.2	258815

Prep Batch: 259159

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	Distill/CN	
460-96707-A-2-B MS	Matrix Spike	Total/NA	Water	Distill/CN	
LCS 490-259159/2-A	Lab Control Sample	Total/NA	Water	Distill/CN	
LCSD 490-259159/3-A	Lab Control Sample Dup	Total/NA	Water	Distill/CN	
MB 490-259159/1-A	Method Blank	Total/NA	Water	Distill/CN	

Analysis Batch: 259402

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	335.4	259159
460-96707-A-2-B MS	Matrix Spike	Total/NA	Water	335.4	259159
LCS 490-259159/2-A	Lab Control Sample	Total/NA	Water	335.4	259159
LCSD 490-259159/3-A	Lab Control Sample Dup	Total/NA	Water	335.4	259159
MB 490-259159/1-A	Method Blank	Total/NA	Water	335.4	259159

Prep Batch: 259884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	365.2/365.3/365	
490-80729-E-2-G MS	Matrix Spike	Total/NA	Water	365.2/365.3/365	
490-80729-E-2-H MSD	Matrix Spike Duplicate	Total/NA	Water	365.2/365.3/365	
LCS 490-259884/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	
MB 490-259884/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	

Analysis Batch: 260148

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	SM 2540C	
490-80902-Q-1 DU	Duplicate	Total/NA	Water	SM 2540C	
490-81525-M-1 DU	Duplicate	Total/NA	Water	SM 2540C	
LCS 490-260148/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 490-260148/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
MB 490-260148/1	Method Blank	Total/NA	Water	SM 2540C	

Analysis Batch: 260237

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 SO3 B	
160-12349-1 MS	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 SO3 B	
160-12349-1 MSD	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 SO3 B	
490-80720-G-1 DU	Duplicate	Total/NA	Water	SM 4500 SO3 B	
LCS 490-260237/2	Lab Control Sample	Total/NA	Water	SM 4500 SO3 B	
MB 490-260237/1	Method Blank	Total/NA	Water	SM 4500 SO3 B	

General Chemistry (Continued)

Analysis Batch: 260520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	365.4	259884
490-80729-E-2-G MS	Matrix Spike	Total/NA	Water	365.4	259884
490-80729-E-2-H MSD	Matrix Spike Duplicate	Total/NA	Water	365.4	259884
LCS 490-259884/2-A	Lab Control Sample	Total/NA	Water	365.4	259884
MB 490-259884/1-A	Method Blank	Total/NA	Water	365.4	259884

Analysis Batch: 260593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 Cl G	
160-12349-1 DU	SCRUBBER TEST 6-16	Total/NA	Water	SM 4500 Cl G	
LCS 490-260593/2	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	
MB 490-260593/1	Method Blank	Total/NA	Water	SM 4500 Cl G	

Analysis Batch: 261237

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-1	SCRUBBER TEST 6-16	Total/NA	Water	SM 2540D	
160-12349-1 DU	SCRUBBER TEST 6-16	Total/NA	Water	SM 2540D	
LCS 490-261237/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 490-261237/1	Method Blank	Total/NA	Water	SM 2540D	

Surrogate Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - Scrubber Water

TestAmerica Job ID: 160-12349-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(78-127)	(75-123)	(80-120)	(80-120)
160-12349-1 - DL	SCRUBBER TEST 6-16	121	100	110	100
160-12349-1 - DL2	SCRUBBER TEST 6-16	105	95	106	96
LCS 160-197153/10	Lab Control Sample	114	99	104	101
LCSD 160-197153/11	Lab Control Sample Dup	111	97	107	98

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(83-117)	(84-120)	(85-115)	(85-115)
LCS 160-196001/12	Lab Control Sample	99	101	101	102

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	12DCE	TOL	DBFM
Lab Sample ID	Client Sample ID	(84-120)	(83-117)	(85-115)	(85-115)
160-12349-1	SCRUBBER TEST 6-16	103	107	101	108
160-12349-1	SCRUBBER TEST 6-16	94	103	100	112
160-12349-1 MS	SCRUBBER TEST 6-16	98	106	103	101
160-12349-1 MSD	SCRUBBER TEST 6-16	95	101	107	103
LB 160-196022/1-A	Method Blank	103	100	95	105

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
12DCE = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	PHL	TPH
Lab Sample ID	Client Sample ID	(47-103)	(30-99)	(10-74)	(31-105)	(10-50)	(68-116)
160-12274-I-1-A MS	Matrix Spike	87	78	40	86	26	61 X

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	PHL	TPH
Lab Sample ID	Client Sample ID	(47-103)	(30-99)	(10-74)	(31-105)	(10-50)	(68-116)
160-12274-J-1-A MSD	Matrix Spike Duplicate	83	74	39	81	25	57 X
160-12349-1 - DL	SCRUBBER TEST 6-16	0 D X	0 D X	0 D X	0 D X	0 D X	0 D X
160-12349-1	SCRUBBER TEST 6-16	0 X D	0 X D	0 X D	0 X D	0 X D	0 X D
LCS 160-196049/2-A	Lab Control Sample	81	71	50	76	37	76
MB 160-196049/1-A	Method Blank	90	77	55	84	40	79

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	PHL	TPH
Lab Sample ID	Client Sample ID	(49-100)	(45-94)	(46-92)	(51-98)	(37-95)	(60-113)
LB 160-197372/1-A	Method Blank	70	79	68	81	56	72
LCS 160-197372/2-A	Lab Control Sample	73	79	66	79	57	73

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	NBZ	PHL	TPH	FBP	2FP
Lab Sample ID	Client Sample ID	(49-100)	(51-98)	(37-95)	(60-113)	(45-94)	(46-92)
160-12349-1	SCRUBBER TEST 6-16	70	108 X	43	57 X	69	56
160-12349-1 MS	SCRUBBER TEST 6-16	70	107 X	13 X	65	75	52
160-12349-1 MSD	SCRUBBER TEST 6-16	71	104 X	16 X	65	74	50

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)

Surrogate Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - Scrubber Water

TestAmerica Job ID: 160-12349-1

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		DCB2	TCX2
Lab Sample ID	Client Sample ID	(43-131)	(44-115)
LCS 160-197348/2-A	Lab Control Sample	74	98

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Water — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)	
		DCB2	TCX2
Lab Sample ID	Client Sample ID	(43-131)	(44-115)
160-12349-1	SCRUBBER TEST 6-16	96	938 p X
160-12387-B-1-J MS	Matrix Spike	93	67 p
160-12387-B-1-K MSD	Matrix Spike Duplicate	96	105
LB 160-196535/1-D	Method Blank	73	89

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

Method: 8151A - Herbicides (GC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCPA2
Lab Sample ID	Client Sample ID	(56-147)
LB 160-197374/1-A	Method Blank	96
LCS 160-197374/2-A	Lab Control Sample	129

Surrogate Legend

DCPA = 2,4-Dichlorophenylacetic acid

Method: 8151A - Herbicides (GC)

Matrix: Water — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)
		DCPA2
Lab Sample ID	Client Sample ID	(56-147)
160-12349-1	SCRUBBER TEST 6-16	1462 X
160-12404-G-1-H MS	Matrix Spike	1035 X
160-12404-G-1-I MSD	Matrix Spike Duplicate	788 X

Surrogate Legend

DCPA = 2,4-Dichlorophenylacetic acid

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

TestAmerica Job ID: 160-12404-1
Client Project/Site: Bridgeton Landfill - SOX Treatment

For:
Republic Services Inc
Bridgeton Landfill Authority Division337
13570 St Charles Rock Road
Bridgeton, Missouri 63044

Attn: Derek Bouchard

Authorized for release by:
7/8/2015 5:17:08 PM

Erika Gish, Project Manager II
(314)298-8566
erika.gish@testamericainc.com

Table of Contents

Job ID: 160-12404-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Republic Services Inc

Project: Bridgeton Landfill - SOX Treatment

Report Number: 160-12404-1

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 some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 6/19/2015 8:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.5º C and 3.4º C.

Receipt Exceptions

Nitric bottle arrived w/pH ~ 10 added Nitric acid, pH remained same. Two sulfuric bottles arrived w/pH ~ 10, sulfuric acid was added to each bottle and pH of both bottles remained ~ 10: TEST 2 STAGE 2 BLEACH (160-12404-1).

TCLP VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for TCLP volatile organic compounds (GC-MS) in accordance with EPA SW846 Method 1311/8260C. The samples were leached on 06/22/2015 and analyzed on 06/22/2015, 06/23/2015 and 06/24/2015.

Analytical Batch 196598

The following compound did not meet the minimum relative response factor limits in the continuing calibration verification (CCV)

Job ID: 160-12404-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

associated with batch 160-196598: 2-Butanone. A low-level CCV was analyzed at the reporting limit (5ug/L) and the affected analytes were detected. Target analytes recovering above the reporting limit will be qualified and reported. (CCVIS 160-196598/5)

The following sample was analyzed at reduced volume due to high concentrations of target analytes: TEST 2 STAGE 1-H2O WASH (160-12404-2). The calculation was done using an initial volume adjustment and a dilution factor. The reporting limits have been elevated by the appropriate factor.

The native sample, matrix spike, and matrix spike duplicate (MS/MSD) associated with preparation batch 160-196524 and analytical batch 160-196598 were performed at the same dilution. Due to the high level of analyte present in the spiked samples, the concentration of Chloroform and 2-Butanone (MEK) in the MS/MSD was above the instrument calibration range. The data have been reported and qualified.

Analytical Batch 197153
The following samples were analyzed at reduced volume due to high concentrations of target analytes: TEST 2 STAGE 2 BLEACH (160-12404-1). The calculation was done using an initial volume adjustment and a dilution factor. The reporting limits have been elevated by the appropriate factor.

The following compounds did not meet the minimum relative response factor limits in the continuing calibration verification (CCV) associated with batch 160-197153: 2-Butanone. A low-level CCV was analyzed at the reporting limit (5ug/L) and the affected analytes were detected. Target analytes recovering above the reporting limit will be qualified and reported. (CCVIS 160-197153/4)

The continuing calibration verification (CCV) associated with batch 160-197153 recovered outside acceptance criteria, low biased, for Vinyl chloride. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported. (CCVIS 160-197153/4)

A matrix spike/matrix spike duplicate (MS/MSD) was not performed with batch 160-197153. The associated samples were all analyzed at a dilution. The associated laboratory control samples (LCS/LCSD) were performed to demonstrate accuracy and precision; both met acceptance criteria.

Analytical Batch 197849
The continuing calibration verification (CCV) associated with batch 160-197849 recovered above the upper control limit for Vinyl chloride. There are no samples associated with this CCV; only a re-analysis of the LCS; therefore, the data have been reported. (CCVIS 160-197849/3)

LCS was re-analyzed due to carryover of 2-Butanone from samples with high levels of this analyte, which resulted in LCS recovery above the upper QC limit in the original analysis. (LCS 160-197849/4)

The following compounds did not meet the minimum relative response factor limits in the continuing calibration verification (CCV) associated with batch160-197849: 2-Butanone. A low-level CCV was analyzed at the reporting limit (5ug/L) and the affected analytes were detected. Target analytes recovering above the reporting limit will be qualified and reported. (CCVIS 160-197849/3)

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

VOLATILE ORGANIC COMPOUNDS (GC MS)
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for volatile organic compounds (GC MS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 06/24/2015 and 06/25/2015.

Analytical Batch 197153
The following samples were analyzed at reduced volume due to high concentrations of target analytes: TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2). The calculation was done using an initial volume adjustment and a dilution factor. The reporting limits have been elevated by the appropriate factor. The original dilution was performed due to strong sample odor; the higher level dilution was due to high target analytes in the original dilution.

The following compounds did not meet the minimum relative response factor limits in the continuing calibration verification (CCV) associated with batch 160-197153: Acetone, Methyl acetate, and 2-Butanone. A low-level CCV was analyzed at the reporting limit (5ug/L)

Job ID: 160-12404-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

and the affected analytes were detected. Target analytes recovering above the reporting limit will be qualified and reported. (CCVIS 160-197153/4)

The continuing calibration verification (CCV) associated with batch 160-197153 recovered outside acceptance criteria, low biased, for Vinyl chloride. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported. (CCVIS 160-197153/4)

A matrix spike/matrix spike duplicate (MS/MSD) was not performed with batch 160-197153;The associated samples were all analyzed at a dilution. The associated laboratory control samples (LCS/LCSD) were performed to demonstrate accuracy and precision; both met acceptance criteria.

A Tentatively Identified Compound (TIC) search was performed on the sample for the following compounds; Dimethyl sulfide, dimethyl disulfide and dimethyl sulfoxide.

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

Organic Prep
Method 8270
Batch 197376
Due to the matrices, the initial volumes used for the following samples deviated from the standard procedure: TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2). The reporting limits (RLs) have been adjusted proportionately. Analyst requested that the samples be done at a 10x dilution for the extraction and that the QC have an LCSD due to possible matrix interference.

Samples have a very strong odor and 12404-1 had a strong chemical reaction to the pH adjustments.

Method(s)
8151A, 8270, 8081
TEST 2 STAGE 2 BLEACH (160-12404-1), TEST 2 STAGE 1-H2O WASH (160-12404-2), (160-12404-G-1-B MS) and (160-12404-G-1-B MSD) These samples had a very strong odor. Samples 12349-1 and 12404-1 had a very strong chemical reaction when the PH was adjusted. The BNAs were allowed to sit for 60mins in order for the chemical reaction to cease.

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

TCLP SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for TCLP semivolatile organic compounds (GC-MS) in accordance with EPA SW-846 Methods 1311 / 8270D. The samples were leached on 06/22/2015, prepared on 06/25/2015 and analyzed on 06/29/2015.

Analytical Batch 197753
The following samples were diluted due to the nature of the sample matrix: TEST 2 STAGE 2 BLEACH (160-12404-1), TEST 2 STAGE 1-H2O WASH (160-12404-2), (160-12349-H-1-N MS) and (160-12349-H-1-O MSD). Elevated reporting limits (RLs) are provided.

Surrogate recovery for the following samples was outside control limits: TEST 2 STAGE 2 BLEACH (160-12404-1), TEST 2 STAGE 1-H2O WASH (160-12404-2), (160-12349-H-1-N MS) and (160-12349-H-1-O MSD). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for 2-Methylphenol and Pyridine and precision for 2-Methylphenol were outside control limits. Sample matrix interference is suspected.

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

SEMIVOLATILE ORGANIC COMPOUNDS (GC MS)
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for semivolatile organic compounds (GC MS) in accordance with EPA SW-846 Method 8270D. The samples were prepared on 06/25/2015 and analyzed on 06/29/2015.

Job ID: 160-12404-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

Analytical Batch 197753
The following samples were diluted due to the nature of the sample matrix: TEST 2 STAGE 2 BLEACH (160-12404-1), TEST 2 STAGE 1-H2O WASH (160-12404-2). Elevated reporting limits (RLs) are provided.

The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 160-197376 and analytical batch 160-197753 recovered outside control limits for the following analytes: 4-Chloroaniline and 4-Nitrophenol. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

The %RPD of the laboratory control sample (LCS) and laboratory control standard duplicate (LCSD) for preparation batch 197376 recovered outside control limits for the following analyte: Hexachlorocyclopentadiene.

Surrogate recovery for the following samples was outside control limits: TEST 2 STAGE 2 BLEACH (160-12404-1), TEST 2 STAGE 1-H2O WASH (160-12404-2). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

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

TCLP CHLORINATED PESTICIDES
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for TCLP chlorinated pesticides in accordance with EPA SW-846 Methods 1311/ 8081B. The samples were leached on 06/22/2015, prepared on 06/25/2015 and analyzed on 06/27/2015 and 07/01/2015.

Analytical Batch 197511
Tetrachloro-m-xylene surrogate recovery for the following samples was outside control limits: TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

The laboratory control sample (LCS) and matrix spike duplicate (MSD) recovered outside control limits for the following analytes: Endrin, gamma-BHC (Lindane) and Heptachlor epoxide. The matrix spike (MS) recovered outside control limits for the following analyte: gamma-BHC (Lindane). The matrix spike duplicate (MSD) recovered outside control limits for the following analyte: Methoxychlor. These analytes were biased high in the LCS, MS, and MSD and were not detected above the RL the associated samples; therefore, the data have been reported. The MS/MSD RPD for Methoxychlor is also outside QC limits.

The %RPD between the primary and confirmation column exceeded 40% for Heptachlor for the following sample: TEST 2 STAGE 2 BLEACH (160-12404-1). The lower value has been reported and qualified in accordance with the laboratory's SOP.

Analyst notice days later after running a multitude of samples that the Toxaphene curve in 160-197511 on the B colum only, was missing 2 levels for only peak #4 of Toxaphene. Due to this excursion, Toxaphene will be reported from the A column only. Any sample that needs Toxaphene reported from the B column will be re-analyzed with a new calibration. Analyst will perform a new calibration when current run (06/30/15) is finished and before new samples are analyzed. This excursion has no adverse affect on the data presented and issue was discussed with QA Manager. (ICRT 160-197511/7)

Analytical Batch 198223
The %RPD between the primary and confirmation column exceeded 40% for Toxaphene for the following sample: TEST 2 STAGE 1-H2O WASH (160-12404-2). The lower value has been reported and qualified in accordance with the laboratory's SOP.

Method 8081B requires a minimum of 3 peaks to be used for Toxaphene quantitation. Due to the presence of matrix interferences in the following sample, TEST 2 STAGE 1-H2O WASH (160-12404-2) , only 3 peaks were used for quantitation.

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

TCLP CHLORINATED HERBICIDES
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for TCLP chlorinated herbicides in accordance with SW- 846 Method 9315. The samples were leached on 06/22/2015, prepared on 06/25/2015 and analyzed on 06/29/2015.

Job ID: 160-12404-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

Surrogate recovery for the following samples was outside control limits: TEST 2 STAGE 2 BLEACH (160-12404-1), (160-12404-G-1-H MS) and (160-12404-G-1-I MSD). Evidence of matrix interference is present and confirmed by the MS/MSD; therefore, re-extraction and/or re-analysis was not performed.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the recoveries and precision was within acceptance limits on the confirmation column.

The CCV recoveries are outside the upper QC limits of 20%D on the confirmation column for 2,4-D. The CCV recoveries on the primary column are acceptable; therefore the sample data will be reported with this narrative. (CCV 160-197744/12), (CCV 160-197744/3)

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

TCLP METALS (ICP)

Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for TCLP metals (ICP) in accordance with EPA SW-846 Method 1311/6010C. The samples were leached on 06/22/2015, prepared on 06/24/2015 and analyzed on 06/30/2015.

The following sample was diluted due to the nature of the sample matrix. The samples were high in salts, which cause internal standard and QC failures when the samples are run at a lesser dilution: TEST 2 STAGE 2 BLEACH (160-12404-1). Elevated reporting limits (RLs) are provided.

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

TOTAL METALS (ICP)

Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for total metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 06/24/2015 and analyzed on 06/30/2015.

Due to their reactive nature dilutions were performed for the following samples: TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2). These dilutions were prepared as follows: 25mL to 50mL

The following sample was diluted to bring the concentration of target analytes within the calibration range: TEST 2 STAGE 2 BLEACH (160-12404-1). Elevated reporting limits (RLs) are provided.

Several analytes were detected in method blank MB 160-197131/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged.

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

TCLP MERCURY

Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for TCLP mercury in accordance with EPA SW-846 Methods 1311/7470A. The samples were leached on 06/22/2015, and prepared and analyzed on 06/23/2015.

Samples became clear during digestion. Samples maintained Potassium Permanganate for 20 minutes prior to heating. TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2)

Mercury was detected in method blank LB 160-196535/1-B at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged.

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

TOTAL MERCURY

Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 06/23/2015.

Job ID: 160-12404-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

The following samples were diluted due to their reactive nature with Sulfuric acid and Potassium Permanganate. Samples also reduced all Potassium Permanganate. An extended time frame between addition of Permanganate and heating was utilized to ensure Permanganate persists: TEST 2 STAGE 2 BLEACH (160-12404-1).

Samples became clear during digestion. Samples maintained Potassium Permanganate color for 20 minutes prior to heating. TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2)

The following sample was diluted to bring the concentration of target analytes within the calibration range: TEST 2 STAGE 2 BLEACH (160-12404-1). Elevated reporting limits (RLs) are provided.

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

1664A

Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for 1664A in accordance with EPA Method 1664A. The samples were prepared and analyzed on 06/29/2015 and 06/30/2015.

The reference method requires samples to be preserved to a pH of <2. The following sample was received with insufficient preservation at a pH of 11: TEST 2 STAGE 2 BLEACH (160-12404-1). The sample(s) was preserved to the appropriate pH in the laboratory.

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

ALKALINITY

Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 06/22/2015.

The following samples was saturated for alkalinity and would not titrate completely: TEST 2 STAGE 2 BLEACH (160-12404-1) and (160-12404-V-1 DU). Reanalysis was not performed at a dilution per SOP.

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

TOTAL DISSOLVED SOLIDS

Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for total dissolved solids in accordance with SM 2540C. The samples were analyzed on 06/23/2015.

The minimum analysis volume of 1 mL was used for the following sample which produced a base result greater than 200mg before calculation of the final result: TEST 2 STAGE 2 BLEACH (160-12404-1). The reference method specifies that no more than 200mg of weight be recovered for a chosen sample analysis volume in order to produce the best data precision. As such, the data has been qualified.

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

TOTAL SUSPENDED SOLIDS

Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for total suspended solids in accordance with SM 2540D. The samples were analyzed on 06/23/2015.

Total Suspended Solids exceeded the RPD limit for the duplicate of sample 490-81025-1. 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.

ANIONS, ION CHROMATOGRAPHY

Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for Anions, Ion Chromatography in accordance with EPA Method 300.0. The samples were analyzed on 06/20/2015.

Analytical Batch 196414

Job ID: 160-12404-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

The following samples in Anion batch 196414 were analyzed at dilution to start (20x) due to high sample conductivities and strong odor: TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2). Further dilutions were then required for sample 12404-1. All reported Chloride and Sulfate results are above the adjusted reporting limit (RL) at dilution.

Analytical Batch 196415
The following samples in Anion batch 196415 were analyzed at dilution to start (20x) due to high sample conductivities and strong odor: TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2). Further dilutions were then required for sample TEST 2 STAGE 2 BLEACH (160-12404-1) to reduce matrix interference for Nitrite and Nitrate.

The matrix spike (MS) performed on the following sample in Anion batch 196415 recovered outside control limits for Nitrite at 73% recovery: (160-12404-J-2 MS). 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.

TOTAL CYANIDE
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for total cyanide in accordance with EPA Method 335.4. The samples were prepared on 06/23/2015 and analyzed on 06/24/2015.

The matrix spike (MS) recovery was outside control limits. Sample matrix interference and/or non-homogeneity are 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.

AMMONIA
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for ammonia in accordance with EPA Method 350.2. The samples were prepared on 06/26/2015 and analyzed on 06/27/2015.

Ammonia failed the recovery criteria low for the MS of sample 490-80936-2 in batch 490-260047.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 490-259920 and analytical batch 490-260047 were outside control limits. Sample matrix interference and/or non-homogeneity are 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.

TOTAL KJELDAHL NITROGEN
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for total kjeldahl nitrogen in accordance with EPA Method 351.2. The samples were prepared on 06/26/2015 and analyzed on 06/28/2015.

The following sample was digested at a reduced volume due to sample matrix: TEST 2 STAGE 1-H2O WASH (160-12404-2). Elevated reporting limits (RLs) are provided.

The method blank contained Kjeldahl Nitrogen as N above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

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

TOTAL PHOSPHORUS
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for total phosphorus in accordance with EPA Method 365.4. The samples were prepared on 06/30/2015 and analyzed on 07/01/2015.

The following samples was distilled at a reduced volume due to matrix:TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2). Elevated reporting limits (RLs) are provided.

Job ID: 160-12404-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

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

TOTAL RESIDUAL CHLORINE
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for total residual chlorine in accordance with SM 4500_CL_G. The samples were analyzed on 06/29/2015.

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

CHEMICAL OXYGEN DEMAND
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for chemical oxygen demand in accordance with SM 5220D. The samples were analyzed on 06/29/2015 and 07/01/2015.

The following sample was diluted due to the nature of the sample matrix: TEST 2 STAGE 2 BLEACH (160-12404-1). Elevated reporting limits (RLs) are provided.

The matrix spike duplicate (MSD) recovery was outside control limits. Sample matrix interference and/or non-homogeneity are 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.

PH
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for pH in accordance with SM 4500 H+ B. The samples were analyzed on 06/22/2015.

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

SULFIDE
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for sulfide in accordance with SM 4500 S2 E. The samples were analyzed on 06/24/2015.

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

SULFITE
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for sulfite in accordance with SM 4500 SO3 B. The samples were analyzed on 07/01/2015.

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

BIOCHEMICAL OXYGEN DEMAND
Samples TEST 2 STAGE 2 BLEACH (160-12404-1) and TEST 2 STAGE 1-H2O WASH (160-12404-2) were analyzed for Biochemical Oxygen Demand in accordance with SM 5210B. The samples were analyzed on 06/20/2015.

All the dilutions over depleted for the following sample: TEST 2 STAGE 1-H2O WASH (160-12404-2). Only a greater than result could be calculated from the most dilute preparation.

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

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	Lab PM: Gish, Erika K	Carrier Tracking No(s):	COC No: 160-2868-1358.1
Client Contact: Mr. Derek Bouchard	Phone:	E-Mail: erika.gish@testamericainc.com		Page: Page 1 of 2
Company: Bridgeton Landfill, LLC				Job #:
Address: 13570 St. Charles Rock Road	Due Date Requested:			
City: Bridgeton	TAT Requested (days):			
State, Zip: MO, 63044				
Phone: 314-656-2114(Tel)	PO #: PO5125278			
Email: dbouchard@republicservices.com	WO #:			
Project Name: Bridgeton Landfill - Scrubber Water	Project #: 16004340			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300_ORGFM_28D, 300_ORGFMS	6010C, 7470A	8260C - (MOD) OLM 4.2	8270D - OLM 4.2	350.1, 351.2, 365.4, 5220D	2320B, 4500_CL_G, SM4500_H+	1664A - Fats, Oils or Grease	2540D, SM5210B_BODCalc	2540C_Calcd - Total Dissolved Solids	SM4500_S2_F - Total Sulfide	335.4 - Cyanide, Total	SM4500SO3_B - Sulfite	8260C - RCRA list	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	A	N	S	N	A	N	N	CB	B	K	N		
Test 2 Stage 2 Bleach	6/18/15	2300	G	WW			X	X	X	X	X	X	X	X	X	X	X	X	X		
Test 2 Stage 1 - Wash Wash	6/18/15	2200	G	WW			X	X	X	X	X	✓	X	X	X	—	X	✓	X		

160-12404 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:	
Relinquished by:	Date/Time: 6/19/15 1845	Company CEC	Received by:	Date/Time: 6-19-15 0845	Company TAS Louis
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∧ Yes ∧ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	Lab PM: Gish, Erika K	Carrier Tracking No(s):	COC No: 160-2859-1351.2
Client Contact: Mr. Derek Bouchard	Phone:	E-Mail: erika.gish@testamericainc.com		Page: Page 2 of 2
Company: Bridgeton Landfill, LLC				Job #:
Address: 13570 St. Charles Rock Road	Due Date Requested:			
City: Bridgeton	TAT Requested (days):			
State, Zip: MO, 63044				
Phone: 314-656-2114(Tel)	PO #: Purchase Order Requested			
Email: dbouchard@republicservices.com	WO #:			
Project Name: Bridgeton Landfill - Scrubber Water	Project #: 16004340			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C, 7470A	8081B, 8151A, 8270D	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N		
Test 2 Stage 2 - Bleach	6/18/15	2200	G	WW			X	X		
Test 2 Stage 1 - H2O Wash	6/18/15	2200	G	WW			X	X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:			
Relinquished by:	Date/Time: 6/19/15 845	Company CEC	Received by:	Date/Time: 6-19-15 0845	Company TASTLouis	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company	

Custody Seals Intact: △ Yes △ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gish, Erika K	Carrier Tracking No(s):	COC No: 160-57245.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: erika.gish@testamericainc.com		Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc				Job #: 160-12404-1
Address: 2960 Foster Creighton Drive, ,	Due Date Requested: 7/1/2015			
City: Nashville	TAT Requested (days):			
State, Zip: TN, 37204				
Phone: 615-726-0177(Tel) 615-726-3404(Fax)	PO #:			
Email:	WO #:			
Project Name: Bridgeton Landfill - SOX Treatment	Project #: 16004340			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2320B/ (MOD) Alkalinity as CaCO3 (Total, Carbon	2540C_Calcd/ Total Dissolved Solids	2540D/ Total Suspended Solids	4500_CL_G/ Total Residual Chlorine	5220D/ Chemical Oxygen Demand (COD)	SM4500_S2_F/ Total Sulfide	SM4500_H+/ pH	SM4500SO3_B/ Sulfite	SM5210B_BODCalc/ Biochemical Oxygen Demand (BOD 5-Day)	1664A/1664A_SPE Oil & Grease (HEM)	335.4/Distill_CN Total Cyanide	350.1/Distill_Ammonia (MOD) Copy Analytes	351.2/351.2_Prep Total Kjeldahl Nitrogen	Total Number of containers	Special Instructions/Note:
			Preservation Code:																		
TEST 2 STAGE 2 BLEACH (160-12404-1)	6/18/15	22:00 Central		Water			X	X	X	X	X	X	X	X	X	X	X	X	X	15	
TEST 2 STAGE 1-H2O WASH (160-12404-2)	6/18/15	22:00 Central		Water			X	X	X	X	X	X	X	X	X	X	X	X	X	14	

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	6/19/15 1700	TA STL	FAN 0.8	06/20/15 0840	FAN
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.8

7/8/2015

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Gish, Erika K	Carrier Tracking No(s):	COC No: 160-57245.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: erika.gish@testamericainc.com		Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc		Analysis Requested		Job #: 160-12404-1

Address: 2960 Foster Creighton Drive, ,	Due Date Requested: 7/1/2015
City: Nashville	TAT Requested (days):
State, Zip: TN, 37204	
Phone: 615-726-0177(Tel) 615-726-3404(Fax)	PO #:
Email:	WO #:
Project Name: Bridgeton Landfill - SOX Treatment	Project #: 16004340
Site:	SSOW#:

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	365.4/365_Prep Total Phosphorus	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
TEST 2 STAGE 2 BLEACH (160-12404-1)	6/18/15	22:00 Central		Water			X	15	
TEST 2 STAGE 1-H2O WASH (160-12404-2)	6/18/15	22:00 Central		Water			X	14	

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	6/19/15 1700	TA STL	TAN 0.8	06/20/15 0840	TAN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

7/8/2015

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

Loc: 160
12404

Cooler Received/Opened On 6/20/2015 @ 8:40

1. Tracking # 0738 (last 4 digits, FedEx)

Courier: Fed-ex IR Gun ID 17960358

2. Temperature of rep. sample or temp blank when opened: 0.8 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES..NO..NA

If yes, how many and where:_____

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES..NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) EZM

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES..NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES..NO...NA

12. Did all container labels and tags agree with custody papers? YES..NO...NA

13a. Were VOA vials received? YES..NO..NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO..NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES..NO..NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO..NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) _____

17. Were custody papers properly filled out (ink, signed, etc)? YES..NO...NA

18. Did you sign the custody papers in the appropriate place? YES..NO...NA

19. Were correct containers used for the analysis requested? YES..NO...NA

20. Was sufficient amount of sample sent in each container? YES..NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) _____

I certify that I attached a label with the unique LIMS number to each container (intial) _____

21. Were there Non-Conformance issues at login? YES..NO Was a PIPE generated? YES..NO..#_____

BIS = Broken in shipment

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 160-12404-1

Login Number: 12404
List Number: 1
Creator: Clarke, Jill C

List Source: TestAmerica St. Louis

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
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?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	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	Preservative was added to samples received with incorrect pH.
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").	False	3 of 3 voa vials had headspace
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Republic Services Inc

Job Number: 160-12404-1

Login Number: 12404
List Number: 2
Creator: Gambill, Shane

List Source: TestAmerica Nashville
List Creation: 06/20/15 12:50 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
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	0.8
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.	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.	True	

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

GC/MS Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F2	MS/MSD RPD exceeds control limits
*	LCS or LCSD is outside acceptance limits.
*	RPD of the LCS and LCSD exceeds the control limits

GC Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.
F2	MS/MSD RPD exceeds control limits
*	LCS or LCSD is outside acceptance limits.
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

HPLC/IC

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
E	Result exceeded calibration range.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.
F3	Duplicate RPD exceeds the control limit

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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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)

Method Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - SOX Treatment

TestAmerica Job ID: 160-12404-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL SL
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL SL
8081B	Organochlorine Pesticides (GC)	SW846	TAL SL
8151A	Herbicides (GC)	SW846	TAL SL
300.0	Anions, Ion Chromatography	MCAWW	TAL SL
6010C	Metals (ICP)	SW846	TAL SL
7470A	Mercury (CVAA)	SW846	TAL SL
1664A	HEM and SGT-HEM	1664A	TAL NSH
335.4	Cyanide, Total	MCAWW	TAL NSH
350.1	Nitrogen, Ammonia	MCAWW	TAL NSH
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL NSH
365.4	Phosphorus, Total	EPA	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL NSH
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL NSH
SM 4500 Cl G	Chlorine, Residual	SM	TAL NSH
SM 4500 H+ B	pH	SM	TAL NSH
SM 4500 S2 F	Sulfide, Total	SM	TAL NSH
SM 4500 SO3 B	Sulfite	SM	TAL NSH
SM 5220D	COD	SM	TAL NSH
SM5210B	BOD, 5 Day	SM	TAL NSH

Protocol References:

1664A = EPA-821-98-002
EPA = US Environmental Protection Agency
MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
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 NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177
TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - SOX Treatment

TestAmerica Job ID: 160-12404-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-12404-1	TEST 2 STAGE 2 BLEACH	Water	06/18/15 22:00	06/19/15 08:45
160-12404-2	TEST 2 STAGE 1-H2O WASH	Water	06/18/15 22:00	06/19/15 08:45

Detection Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - SOX Treatment

TestAmerica Job ID: 160-12404-1

Client Sample ID: TEST 2 STAGE 2 BLEACH — Lab Sample ID: 160-12404-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
4-Methyl-2-pentanone (MIBK) - DL	280	J	2000	33	ug/L	100		8260C	Total/NA
Benzene - DL	180	J	500	25	ug/L	100		8260C	Total/NA
Chloroform - DL	14000		500	15	ug/L	100		8260C	Total/NA
Methyl acetate - DL	16000		2500	230	ug/L	100		8260C	Total/NA
Tetrachloroethene - DL	660		500	28	ug/L	100		8260C	Total/NA
2-Butanone (MEK) - DL2	32000		20000	390	ug/L	1000		8260C	Total/NA
Acetone - DL2	86000		20000	6700	ug/L	1000		8260C	Total/NA
Benzene	0.19		0.050	0.0025	mg/L	1		8260C	TCLP
Carbon tetrachloride	0.0086	J	0.050	0.0036	mg/L	1		8260C	TCLP
Tetrachloroethene	0.46		0.050	0.0028	mg/L	1		8260C	TCLP
2-Butanone (MEK) - DL	34		2.5	0.19	mg/L	50		8260C	TCLP
Chloroform - DL	16		2.5	0.046	mg/L	50		8260C	TCLP
1,4-Dioxane	900		500	50	ug/L	5		8270D	Total/NA
Hexachloroethane	310	J	500	50	ug/L	5		8270D	Total/NA
Naphthalene	59	J	500	50	ug/L	5		8270D	Total/NA
Hexachloroethane	0.092	J	0.25	0.025	mg/L	5		8270D	TCLP
Heptachlor	0.0033	p	0.00050	0.000015	mg/L	1		8081B	TCLP
2,4-D	0.093	F1 F2	0.040	0.020	mg/L	1		8151A	TCLP
Sulfate - DL	140		10	1.0	mg/L	20		300.0	Total/NA
Chloride - DL4	110000		10000	1000	mg/L	50000		300.0	Total/NA
Boron	7500	J B	50000	7200	ug/L	500		6010C	Total/NA
Iron	13000	J B	100000	13000	ug/L	500		6010C	Total/NA
Sodium	40000000		1000000	110000	ug/L	500		6010C	Total/NA
Strontium	500	J B	5000	240	ug/L	500		6010C	Total/NA
Sulfur	400000	J	5000000	270000	ug/L	500		6010C	Total/NA
Arsenic	0.31	J	25	0.22	mg/L	50		6010C	TCLP
Chromium	2.9		1.3	0.42	mg/L	50		6010C	TCLP
Lead	0.14	J	13	0.075	mg/L	50		6010C	TCLP
Mercury	120		4.0	1.2	ug/L	10		7470A	Total/NA
Mercury	0.0021	B	0.0010	0.000079	mg/L	1		7470A	TCLP
Fats, Oils or Grease	79		4.0	1.4	mg/L	1		1664A	Total/NA
Cyanide, Total	0.035		0.010	0.0070	mg/L	1		335.4	Total/NA
Ammonia	0.68	J	1.0	0.60	mg/L	1		350.1	Total/NA
Phosphorus, Total	1.6	J	2.0	1.0	mg/L	1		365.4	Total/NA
Total Dissolved Solids	290000	E	1000	700	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	170		5.0	3.5	mg/L	1		SM 2540D	Total/NA
Chlorine, Total Residual	0.43	HF	0.10	0.040	mg/L	1		SM 4500 Cl G	Total/NA
pH	9.05	HF	0.100	0.100	SU	1		SM 4500 H+ B	Total/NA
Sulfide, Dissolved	5.2		1.0	0.50	mg/L	1		SM 4500 S2 F	Total/NA
Total Sulfide	5.2		1.0	0.50	mg/L	1		SM 4500 S2 F	Total/NA
Sulfite	28	HF	5.0	2.5	mg/L	1		SM 4500 SO3 B	Total/NA
Chemical Oxygen Demand	280	J	400	80	mg/L	20		SM 5220D	Total/NA
Biochemical Oxygen Demand	1400		500	500	mg/L	25		SM5210B	Total/NA

Client Sample ID: TEST 2 STAGE 1-H2O WASH — Lab Sample ID: 160-12404-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene - DL	160	J	500	40	ug/L	100		8260C	Total/NA
1,4-Dichlorobenzene - DL	280	J	500	35	ug/L	100		8260C	Total/NA
2-Hexanone - DL	8600		2000	59	ug/L	100		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica St. Louis

Client Sample ID: TEST 2 STAGE 1-H2O WASH (Continued)

Lab Sample ID: 160-12404-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
4-Isopropyltoluene - DL	270	J	500	32	ug/L	100		8260C	Total/NA
4-Methyl-2-pentanone (MIBK) - DL	3300		2000	33	ug/L	100		8260C	Total/NA
Benzene - DL	2000		500	25	ug/L	100		8260C	Total/NA
Ethylbenzene - DL	110	J	500	30	ug/L	100		8260C	Total/NA
Methyl acetate - DL	96000		2500	230	ug/L	100		8260C	Total/NA
m-Xylene & p-Xylene - DL	220	J	500	57	ug/L	100		8260C	Total/NA
o-Xylene - DL	140	J	500	32	ug/L	100		8260C	Total/NA
Toluene - DL	310	J	500	100	ug/L	100		8260C	Total/NA
Xylenes, Total - DL	360	J	1000	85	ug/L	100		8260C	Total/NA
2-Butanone (MEK) - DL2	250000		100000	2000	ug/L	5000		8260C	Total/NA
Acetone - DL2	550000		100000	33000	ug/L	5000		8260C	Total/NA
Benzene	1.6		0.050	0.0025	mg/L	1		8260C	TCLP
Chlorobenzene	0.013	J	0.050	0.0038	mg/L	1		8260C	TCLP
Chloroform	0.020	J	0.050	0.00092	mg/L	1		8260C	TCLP
2-Butanone (MEK) - DL	250		10	0.78	mg/L	200		8260C	TCLP
1,4-Dichlorobenzene	180	J	500	50	ug/L	5		8270D	Total/NA
1,4-Dioxane	7400		500	50	ug/L	5		8270D	Total/NA
3 & 4 Methylphenol	480	J	1000	100	ug/L	5		8270D	Total/NA
Naphthalene	250	J	500	50	ug/L	5		8270D	Total/NA
Phenol	710		500	100	ug/L	5		8270D	Total/NA
1,4-Dichlorobenzene	0.15	J	0.25	0.025	mg/L	5		8270D	TCLP
2-Methylphenol	0.060	J	0.25	0.050	mg/L	5		8270D	TCLP
3 & 4 Methylphenol	0.58		0.50	0.025	mg/L	5		8270D	TCLP
Toxaphene - RA	0.0030	J p	0.020	0.000050	mg/L	1		8081B	TCLP
Nitrate as N - DL	1.4		0.40	0.080	mg/L	20		300.0	Total/NA
Sulfate - DL	73		10	1.0	mg/L	20		300.0	Total/NA
Chloride - DL	19		4.0	0.40	mg/L	20		300.0	Total/NA
Arsenic	48	B	20	3.6	ug/L	1		6010C	Total/NA
Barium	35	J	100	4.2	ug/L	1		6010C	Total/NA
Boron	60	J B	100	14	ug/L	1		6010C	Total/NA
Calcium	28000	B	2000	110	ug/L	1		6010C	Total/NA
Chromium	36		20	6.7	ug/L	1		6010C	Total/NA
Copper	51		50	4.2	ug/L	1		6010C	Total/NA
Iron	640	B	200	26	ug/L	1		6010C	Total/NA
Lead	10	J B	20	1.2	ug/L	1		6010C	Total/NA
Magnesium	6700		2000	100	ug/L	1		6010C	Total/NA
Manganese	57		30	2.0	ug/L	1		6010C	Total/NA
Nickel	190		80	5.1	ug/L	1		6010C	Total/NA
Potassium	5200	J	10000	910	ug/L	1		6010C	Total/NA
Sodium	25000		2000	210	ug/L	1		6010C	Total/NA
Strontium	150	B	10	0.47	ug/L	1		6010C	Total/NA
Sulfur	35000		10000	530	ug/L	1		6010C	Total/NA
Zinc	43		40	17	ug/L	1		6010C	Total/NA
Arsenic	0.044	J	0.50	0.0045	mg/L	1		6010C	TCLP
Barium	0.029	J	0.13	0.0053	mg/L	1		6010C	TCLP
Chromium	0.030		0.025	0.0084	mg/L	1		6010C	TCLP
Lead	0.0068	J	0.25	0.0015	mg/L	1		6010C	TCLP
Mercury	0.70		0.20	0.060	ug/L	1		7470A	Total/NA
Mercury	0.0018	B	0.0010	0.000079	mg/L	1		7470A	TCLP
Fats, Oils or Grease	1.4	J	3.7	1.3	mg/L	1		1664A	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - SOX Treatment

TestAmerica Job ID: 160-12404-1

Client Sample ID: TEST 2 STAGE 1-H2O WASH (Continued) — Lab Sample ID: 160-12404-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ammonia	1.5		1.0	0.60	mg/L	1		350.1	Total/NA
Kjeldahl Nitrogen as N	74	B	5.0	1.2	mg/L	1		351.2	Total/NA
Phosphorus, Total	4.0		2.0	1.0	mg/L	1		365.4	Total/NA
Bicarbonate Alkalinity as CaCO3	90		10	5.0	mg/L	1		SM 2320B	Total/NA
Alkalinity	90		10	5.0	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	230		10	7.0	mg/L	1		SM 2540C	Total/NA
pH	4.96	HF	0.100	0.100	SU	1		SM 4500 H+ B	Total/NA
Sulfide, Dissolved	5.0		1.0	0.50	mg/L	1		SM 4500 S2 F	Total/NA
Total Sulfide	5.0		1.0	0.50	mg/L	1		SM 4500 S2 F	Total/NA
Sulfite	10	HF	5.0	2.5	mg/L	1		SM 4500 SO3 B	Total/NA
Chemical Oxygen Demand	21000		4000	800	mg/L	200		SM 5220D	Total/NA
Biochemical Oxygen Demand	>3000		100	100	mg/L	50		SM5210B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TEST 2 STAGE 2 BLEACH

Date Collected: 06/18/15 22:00
Date Received: 06/19/15 08:45

Lab Sample ID: 160-12404-1

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		500	25	ug/L			06/24/15 23:26	100
1,1,1-Trichloroethane	ND		500	29	ug/L			06/24/15 23:26	100
1,1,2,2-Tetrachloroethane	ND		500	43	ug/L			06/24/15 23:26	100
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		500	25	ug/L			06/24/15 23:26	100
1,1,2-Trichloroethane	ND		500	57	ug/L			06/24/15 23:26	100
1,1-Dichloroethane	ND		500	39	ug/L			06/24/15 23:26	100
1,1-Dichloroethene	ND		500	37	ug/L			06/24/15 23:26	100
1,1-Dichloropropene	ND		500	30	ug/L			06/24/15 23:26	100
1,2,3-Trichlorobenzene	ND		500	65	ug/L			06/24/15 23:26	100
1,2,3-Trichloropropane	ND		500	56	ug/L			06/24/15 23:26	100
1,2,4-Trichlorobenzene	ND		500	55	ug/L			06/24/15 23:26	100
1,2,4-Trimethylbenzene	ND		500	40	ug/L			06/24/15 23:26	100
1,2-Dibromo-3-Chloropropane	ND		1000	120	ug/L			06/24/15 23:26	100
1,2-Dibromoethane (EDB)	ND		500	44	ug/L			06/24/15 23:26	100
1,2-Dichlorobenzene	ND		500	28	ug/L			06/24/15 23:26	100
1,2-Dichloroethane	ND		500	37	ug/L			06/24/15 23:26	100
1,2-Dichloropropane	ND		500	32	ug/L			06/24/15 23:26	100
1,3,5-Trichlorobenzene	ND		500	51	ug/L			06/24/15 23:26	100
1,3,5-Trimethylbenzene	ND		500	28	ug/L			06/24/15 23:26	100
1,3-Dichlorobenzene	ND		500	23	ug/L			06/24/15 23:26	100
1,3-Dichloropropane	ND		500	24	ug/L			06/24/15 23:26	100
1,4-Dichlorobenzene	ND		500	35	ug/L			06/24/15 23:26	100
2,2-Dichloropropane	ND		500	54	ug/L			06/24/15 23:26	100
2-Chlorotoluene	ND		500	34	ug/L			06/24/15 23:26	100
2-Hexanone	ND		2000	59	ug/L			06/24/15 23:26	100
4-Chlorotoluene	ND		500	31	ug/L			06/24/15 23:26	100
4-Isopropyltoluene	ND		500	32	ug/L			06/24/15 23:26	100
4-Methyl-2-pentanone (MIBK)	**280**	**J**	2000	33	ug/L			06/24/15 23:26	100
Acrylonitrile	ND		5000	170	ug/L			06/24/15 23:26	100
Benzene	**180**	**J**	500	25	ug/L			06/24/15 23:26	100
Bromochloromethane	ND		500	55	ug/L			06/24/15 23:26	100
Bromodichloromethane	ND		500	25	ug/L			06/24/15 23:26	100
Bromoform	ND		500	37	ug/L			06/24/15 23:26	100
Bromomethane	ND		1000	40	ug/L			06/24/15 23:26	100
Carbon disulfide	ND		500	37	ug/L			06/24/15 23:26	100
Carbon tetrachloride	ND		500	36	ug/L			06/24/15 23:26	100
Chlorobenzene	ND		500	38	ug/L			06/24/15 23:26	100
Chloroethane	ND		1000	38	ug/L			06/24/15 23:26	100
Chloroform	**14000**		500	15	ug/L			06/24/15 23:26	100
Chloromethane	ND		1000	55	ug/L			06/24/15 23:26	100
cis-1,2-Dichloroethene	ND		500	16	ug/L			06/24/15 23:26	100
cis-1,3-Dichloropropene	ND		500	34	ug/L			06/24/15 23:26	100
Cyclohexane	ND		1000	36	ug/L			06/24/15 23:26	100
Dibromochloromethane	ND		500	33	ug/L			06/24/15 23:26	100
Dibromomethane	ND		500	41	ug/L			06/24/15 23:26	100
Dichlorodifluoromethane	ND		1000	45	ug/L			06/24/15 23:26	100
Ethylbenzene	ND		500	30	ug/L			06/24/15 23:26	100
Isopropylbenzene	ND		500	26	ug/L			06/24/15 23:26	100
Methyl acetate	**16000**		2500	230	ug/L			06/24/15 23:26	100

Client Sample ID: TEST 2 STAGE 2 BLEACH

Date Collected: 06/18/15 22:00
Date Received: 06/19/15 08:45

Lab Sample ID: 160-12404-1

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS - DL (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		500	40	ug/L			06/24/15 23:26	100
Methylcyclohexane	ND		1000	26	ug/L			06/24/15 23:26	100
Methylene Chloride	ND		500	170	ug/L			06/24/15 23:26	100
m-Xylene & p-Xylene	ND		500	57	ug/L			06/24/15 23:26	100
n-Butylbenzene	ND		500	23	ug/L			06/24/15 23:26	100
N-Propylbenzene	ND		500	30	ug/L			06/24/15 23:26	100
o-Xylene	ND		500	32	ug/L			06/24/15 23:26	100
sec-Butylbenzene	ND		500	31	ug/L			06/24/15 23:26	100
Styrene	ND		500	35	ug/L			06/24/15 23:26	100
tert-Butylbenzene	ND		500	31	ug/L			06/24/15 23:26	100
Tetrachloroethene	**660**		500	28	ug/L			06/24/15 23:26	100
Toluene	ND		500	100	ug/L			06/24/15 23:26	100
trans-1,2-Dichloroethene	ND		500	18	ug/L			06/24/15 23:26	100
trans-1,3-Dichloropropene	ND		500	35	ug/L			06/24/15 23:26	100
Trichloroethene	ND		500	29	ug/L			06/24/15 23:26	100
Trichlorofluoromethane	ND		500	22	ug/L			06/24/15 23:26	100
Vinyl chloride	ND		500	43	ug/L			06/24/15 23:26	100
Xylenes, Total	ND		1000	85	ug/L			06/24/15 23:26	100

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*06/24/15 23:26*	*100*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*78 - 127*		*06/24/15 23:26*	*100*
4-Bromofluorobenzene (Surr)	*100*		*75 - 123*		*06/24/15 23:26*	*100*
Dibromofluoromethane (Surr)	*99*		*80 - 120*		*06/24/15 23:26*	*100*
Toluene-d8 (Surr)	*96*		*80 - 120*		*06/24/15 23:26*	*100*

Method: 8260C - Volatile Organic Compounds by GC/MS - DL2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone (MEK)	**32000**		20000	390	ug/L			06/25/15 01:06	1000
Acetone	**86000**		20000	6700	ug/L			06/25/15 01:06	1000

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*06/25/15 01:06*	*1000*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*78 - 127*		*06/25/15 01:06*	*1000*
4-Bromofluorobenzene (Surr)	*97*		*75 - 123*		*06/25/15 01:06*	*1000*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*06/25/15 01:06*	*1000*
Toluene-d8 (Surr)	*92*		*80 - 120*		*06/25/15 01:06*	*1000*

Method: 8260C - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.050	0.0037	mg/L			06/22/15 19:30	1
1,2-Dichloroethane	ND		0.050	0.0037	mg/L			06/22/15 19:30	1
Benzene	**0.19**		0.050	0.0025	mg/L			06/22/15 19:30	1
Carbon tetrachloride	**0.0086**	**J**	0.050	0.0036	mg/L			06/22/15 19:30	1
Chlorobenzene	ND		0.050	0.0038	mg/L			06/22/15 19:30	1
Tetrachloroethene	**0.46**		0.050	0.0028	mg/L			06/22/15 19:30	1
Trichloroethene	ND		0.050	0.0029	mg/L			06/22/15 19:30	1

Client Sample ID: TEST 2 STAGE 2 BLEACH

Date Collected: 06/18/15 22:00
Date Received: 06/19/15 08:45

Lab Sample ID: 160-12404-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS - TCLP (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		0.10	0.0043	mg/L			06/22/15 19:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*84 - 120*		*06/22/15 19:30*	*1*
1,2-Dichloroethane-d4 (Surr)	*100*		*83 - 117*		*06/22/15 19:30*	*1*
Toluene-d8 (Surr)	*97*		*85 - 115*		*06/22/15 19:30*	*1*
Dibromofluoromethane (Surr)	*97*		*85 - 115*		*06/22/15 19:30*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS - TCLP - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone (MEK)	**34**		2.5	0.19	mg/L			06/24/15 20:32	50
Chloroform	**16**		2.5	0.046	mg/L			06/24/15 20:32	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*84 - 120*		*06/24/15 20:32*	*50*
1,2-Dichloroethane-d4 (Surr)	*110*		*83 - 117*		*06/24/15 20:32*	*50*
Toluene-d8 (Surr)	*96*		*85 - 115*		*06/24/15 20:32*	*50*
Dibromofluoromethane (Surr)	*106*		*85 - 115*		*06/24/15 20:32*	*50*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
1,2-Dichlorobenzene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
1,3-Dichlorobenzene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
1,4-Dichlorobenzene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
1,4-Dioxane	**900**		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
2,4,5-Trichlorophenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
2,4,6-Trichlorophenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
2,4-Dichlorophenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
2,4-Dimethylphenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
2,4-Dinitrophenol	ND		2500	100	ug/L		06/25/15 16:18	06/29/15 15:11	5
2,4-Dinitrotoluene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
2,6-Dinitrotoluene	ND		500	110	ug/L		06/25/15 16:18	06/29/15 15:11	5
2-Chloronaphthalene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
2-Chlorophenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
2-Methylnaphthalene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
2-Methylphenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
2-Nitroaniline	ND		500	55	ug/L		06/25/15 16:18	06/29/15 15:11	5
2-Nitrophenol	ND		500	76	ug/L		06/25/15 16:18	06/29/15 15:11	5
3 & 4 Methylphenol	ND		1000	100	ug/L		06/25/15 16:18	06/29/15 15:11	5
3,3'-Dichlorobenzidine	ND		2500	65	ug/L		06/25/15 16:18	06/29/15 15:11	5
3-Nitroaniline	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
4,6-Dinitro-2-methylphenol	ND		500	63	ug/L		06/25/15 16:18	06/29/15 15:11	5
4-Bromophenyl phenyl ether	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
4-Chloro-3-methylphenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
4-Chloroaniline	ND	*	500	100	ug/L		06/25/15 16:18	06/29/15 15:11	5
4-Chlorophenyl phenyl ether	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
4-Nitroaniline	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
4-Nitrophenol	ND	*	500	100	ug/L		06/25/15 16:18	06/29/15 15:11	5
Acenaphthene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5

Client Sample ID: TEST 2 STAGE 2 BLEACH

Date Collected: 06/18/15 22:00
Date Received: 06/19/15 08:45

Lab Sample ID: 160-12404-1
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthylene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Aniline	ND		500	64	ug/L		06/25/15 16:18	06/29/15 15:11	5
Anthracene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Benzo[a]anthracene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Benzo[a]pyrene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Benzo[b]fluoranthene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Benzo[g,h,i]perylene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Benzo[k]fluoranthene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Benzyl alcohol	ND		500	150	ug/L		06/25/15 16:18	06/29/15 15:11	5
bis (2-chloroisopropyl) ether	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Bis(2-chloroethoxy)methane	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Bis(2-chloroethyl)ether	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Bis(2-ethylhexyl) phthalate	ND		500	93	ug/L		06/25/15 16:18	06/29/15 15:11	5
Butyl benzyl phthalate	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Carbazole	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Chrysene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Dibenz(a,h)anthracene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Dibenzofuran	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Diethyl phthalate	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Dimethyl phthalate	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Di-n-butyl phthalate	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Di-n-octyl phthalate	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Diphenylamine	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Fluoranthene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Fluorene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Hexachlorobenzene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Hexachlorobutadiene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Hexachlorocyclopentadiene	ND	*	500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Hexachloroethane	**310**	**J**	500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Indeno[1,2,3-cd]pyrene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Isophorone	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Naphthalene	**59**	**J**	500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Nitrobenzene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
N-Nitrosodi-n-propylamine	ND		500	75	ug/L		06/25/15 16:18	06/29/15 15:11	5
Pentachlorophenol	ND		500	64	ug/L		06/25/15 16:18	06/29/15 15:11	5
Phenanthrene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Phenol	ND		500	100	ug/L		06/25/15 16:18	06/29/15 15:11	5
Pyrene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:11	5
Pyridine	ND		1000	100	ug/L		06/25/15 16:18	06/29/15 15:11	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*64*		*47 - 103*	*06/25/15 16:18*	*06/29/15 15:11*	*5*
2-Fluorobiphenyl (Surr)	*68*		*30 - 99*	*06/25/15 16:18*	*06/29/15 15:11*	*5*
2-Fluorophenol (Surr)	*47*		*10 - 74*	*06/25/15 16:18*	*06/29/15 15:11*	*5*
Nitrobenzene-d5 (Surr)	*80*		*31 - 105*	*06/25/15 16:18*	*06/29/15 15:11*	*5*
Phenol-d5 (Surr)	*37*		*10 - 50*	*06/25/15 16:18*	*06/29/15 15:11*	*5*
Terphenyl-d14 (Surr)	*60*	*X*	*68 - 116*	*06/25/15 16:18*	*06/29/15 15:11*	*5*

Client Sample ID: TEST 2 STAGE 2 BLEACH

Date Collected: 06/18/15 22:00
Date Received: 06/19/15 08:45

Lab Sample ID: 160-12404-1
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 17:09	5
2,4-Dinitrotoluene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 17:09	5
Hexachlorobenzene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 17:09	5
Hexachlorobutadiene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 17:09	5
Hexachloroethane	**0.092**	**J**	0.25	0.025	mg/L		06/25/15 15:57	06/29/15 17:09	5
2-Methylphenol	ND		0.25	0.050	mg/L		06/25/15 15:57	06/29/15 17:09	5
3 & 4 Methylphenol	ND		0.50	0.025	mg/L		06/25/15 15:57	06/29/15 17:09	5
Nitrobenzene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 17:09	5
Pentachlorophenol	ND		1.3	0.050	mg/L		06/25/15 15:57	06/29/15 17:09	5
Pyridine	ND		0.50	0.13	mg/L		06/25/15 15:57	06/29/15 17:09	5
2,4,5-Trichlorophenol	ND		0.25	0.050	mg/L		06/25/15 15:57	06/29/15 17:09	5
2,4,6-Trichlorophenol	ND		0.25	0.050	mg/L		06/25/15 15:57	06/29/15 17:09	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*0*	*X*	*49 - 100*	*06/25/15 15:57*	*06/29/15 17:09*	*5*
Nitrobenzene-d5 (Surr)	*166*	*X*	*51 - 98*	*06/25/15 15:57*	*06/29/15 17:09*	*5*
Phenol-d5 (Surr)	*5*	*X*	*37 - 95*	*06/25/15 15:57*	*06/29/15 17:09*	*5*
Terphenyl-d14 (Surr)	*73*		*60 - 113*	*06/25/15 15:57*	*06/29/15 17:09*	*5*
2-Fluorobiphenyl (Surr)	*81*		*45 - 94*	*06/25/15 15:57*	*06/29/15 17:09*	*5*
2-Fluorophenol (Surr)	*6*	*X*	*46 - 92*	*06/25/15 15:57*	*06/29/15 17:09*	*5*

Method: 8081B - Organochlorine Pesticides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
gamma-BHC (Lindane)	ND	*	0.00050	0.000015	mg/L		06/25/15 14:37	06/27/15 08:38	1
Endrin	ND	*	0.00050	0.000050	mg/L		06/25/15 14:37	06/27/15 08:38	1
Heptachlor	**0.0033**	**p**	0.00050	0.000015	mg/L		06/25/15 14:37	06/27/15 08:38	1
Heptachlor epoxide	ND	*	0.00050	0.000050	mg/L		06/25/15 14:37	06/27/15 08:38	1
Methoxychlor	ND		0.0010	0.000050	mg/L		06/25/15 14:37	06/27/15 08:38	1
Toxaphene	ND		0.020	0.000050	mg/L		06/25/15 14:37	06/27/15 08:38	1
Technical Chlordane	ND		0.0050	0.00020	mg/L		06/25/15 14:37	06/27/15 08:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*85*		*43 - 131*	*06/25/15 14:37*	*06/27/15 08:38*	*1*
Tetrachloro-m-xylene	*0*	*X*	*44 - 115*	*06/25/15 14:37*	*06/27/15 08:38*	*1*

Method: 8151A - Herbicides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	**0.093**	**F1 F2**	0.040	0.020	mg/L		06/25/15 16:06	06/29/15 11:45	1
Silvex (2,4,5-TP)	ND	F1 F2	0.010	0.0030	mg/L		06/25/15 16:06	06/29/15 11:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*1496*	*X*	*56 - 147*	*06/25/15 16:06*	*06/29/15 11:45*	*1*

Method: 300.0 - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**140**		10	1.0	mg/L			06/20/15 08:59	20

Method: 300.0 - Anions, Ion Chromatography - DL2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		8.0	1.6	mg/L			06/20/15 09:13	400

Client Sample ID: TEST 2 STAGE 2 BLEACH

Date Collected: 06/18/15 22:00
Date Received: 06/19/15 08:45

Lab Sample ID: 160-12404-1

Matrix: Water

Method: 300.0 - Anions, Ion Chromatography - DL3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as N	ND		200	30	mg/L			06/20/15 09:28	10000

Method: 300.0 - Anions, Ion Chromatography - DL4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**110000**		10000	1000	mg/L			06/20/15 09:43	50000

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10000	3700	ug/L		06/24/15 14:36	06/30/15 10:32	500
Arsenic	ND		10000	1800	ug/L		06/24/15 14:36	06/30/15 10:32	500
Barium	ND		50000	2100	ug/L		06/24/15 14:36	06/30/15 10:32	500
Boron	**7500**	**J B**	50000	7200	ug/L		06/24/15 14:36	06/30/15 10:32	500
Cadmium	ND		5000	340	ug/L		06/24/15 14:36	06/30/15 10:32	500
Calcium	ND		1000000	54000	ug/L		06/24/15 14:36	06/30/15 10:32	500
Chromium	ND		10000	3400	ug/L		06/24/15 14:36	06/30/15 10:32	500
Copper	ND		25000	2100	ug/L		06/24/15 14:36	06/30/15 10:32	500
Iron	**13000**	**J B**	100000	13000	ug/L		06/24/15 14:36	06/30/15 10:32	500
Lead	ND		10000	600	ug/L		06/24/15 14:36	06/30/15 10:32	500
Magnesium	ND		1000000	51000	ug/L		06/24/15 14:36	06/30/15 10:32	500
Manganese	ND		15000	1000	ug/L		06/24/15 14:36	06/30/15 10:32	500
Molybdenum	ND		40000	1900	ug/L		06/24/15 14:36	06/30/15 10:32	500
Nickel	ND		40000	2600	ug/L		06/24/15 14:36	06/30/15 10:32	500
Potassium	ND		5000000	460000	ug/L		06/24/15 14:36	06/30/15 10:32	500
Selenium	ND		15000	2100	ug/L		06/24/15 14:36	06/30/15 10:32	500
Silver	ND		10000	990	ug/L		06/24/15 14:36	06/30/15 10:32	500
Sodium	**40000000**		1000000	110000	ug/L		06/24/15 14:36	06/30/15 10:32	500
Strontium	**500**	**J B**	5000	240	ug/L		06/24/15 14:36	06/30/15 10:32	500
Sulfur	**400000**	**J**	5000000	270000	ug/L		06/24/15 14:36	06/30/15 10:32	500
Zinc	ND		20000	8300	ug/L		06/24/15 14:36	06/30/15 10:32	500

Method: 6010C - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.31**	**J**	25	0.22	mg/L		06/24/15 14:33	06/30/15 11:30	50
Barium	ND		6.3	0.27	mg/L		06/24/15 14:33	06/30/15 11:30	50
Cadmium	ND		0.63	0.042	mg/L		06/24/15 14:33	06/30/15 11:30	50
Chromium	**2.9**		1.3	0.42	mg/L		06/24/15 14:33	06/30/15 11:30	50
Lead	**0.14**	**J**	13	0.075	mg/L		06/24/15 14:33	06/30/15 11:30	50
Selenium	ND		25	0.26	mg/L		06/24/15 14:33	06/30/15 11:30	50
Silver	ND		1.3	0.12	mg/L		06/24/15 14:33	06/30/15 11:30	50

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**120**		4.0	1.2	ug/L		06/23/15 08:40	06/23/15 15:13	10

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.0021**	**B**	0.0010	0.000079	mg/L		06/23/15 08:38	06/23/15 14:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fats, Oils or Grease	**79**		4.0	1.4	mg/L		06/30/15 10:28	06/30/15 10:28	1

Client Sample ID: TEST 2 STAGE 2 BLEACH

Lab Sample ID: 160-12404-1
Date Collected: 06/18/15 22:00
Matrix: Water
Date Received: 06/19/15 08:45

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	**0.035**		0.010	0.0070	mg/L		06/23/15 17:52	06/24/15 10:10	1
Ammonia	**0.68**	**J**	1.0	0.60	mg/L		06/26/15 17:15	06/27/15 07:37	1
Kjeldahl Nitrogen as N	ND		0.25	0.060	mg/L		06/26/15 15:31	06/28/15 08:57	1
Phosphorus, Total	**1.6**	**J**	2.0	1.0	mg/L		06/30/15 02:37	07/01/15 12:04	1
Bicarbonate Alkalinity as CaCO3	ND		10	5.0	mg/L			06/22/15 12:58	1
Alkalinity	ND		10	5.0	mg/L			06/22/15 12:58	1
Total Dissolved Solids	**290000**	**E**	1000	700	mg/L			06/23/15 11:00	1
Total Suspended Solids	**170**		5.0	3.5	mg/L			06/23/15 13:30	1
Chlorine, Total Residual	**0.43**	**HF**	0.10	0.040	mg/L			06/29/15 15:48	1
pH	**9.05**	**HF**	0.100	0.100	SU			06/22/15 13:43	1
Sulfide, Dissolved	**5.2**		1.0	0.50	mg/L			06/24/15 20:00	1
Total Sulfide	**5.2**		1.0	0.50	mg/L			06/24/15 20:00	1
Sulfite	**28**	**HF**	5.0	2.5	mg/L			07/01/15 09:54	1
Chemical Oxygen Demand	**280**	**J**	400	80	mg/L			07/01/15 15:10	20
Biochemical Oxygen Demand	**1400**		500	500	mg/L			06/20/15 12:30	25

Client Sample ID: TEST 2 STAGE 1-H2O WASH

Lab Sample ID: 160-12404-2
Date Collected: 06/18/15 22:00
Matrix: Water
Date Received: 06/19/15 08:45

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		500	25	ug/L			06/24/15 23:51	100
1,1,1-Trichloroethane	ND		500	29	ug/L			06/24/15 23:51	100
1,1,2,2-Tetrachloroethane	ND		500	43	ug/L			06/24/15 23:51	100
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		500	25	ug/L			06/24/15 23:51	100
1,1,2-Trichloroethane	ND		500	57	ug/L			06/24/15 23:51	100
1,1-Dichloroethane	ND		500	39	ug/L			06/24/15 23:51	100
1,1-Dichloroethene	ND		500	37	ug/L			06/24/15 23:51	100
1,1-Dichloropropene	ND		500	30	ug/L			06/24/15 23:51	100
1,2,3-Trichlorobenzene	ND		500	65	ug/L			06/24/15 23:51	100
1,2,3-Trichloropropane	ND		500	56	ug/L			06/24/15 23:51	100
1,2,4-Trichlorobenzene	ND		500	55	ug/L			06/24/15 23:51	100
1,2,4-Trimethylbenzene	**160**	**J**	500	40	ug/L			06/24/15 23:51	100
1,2-Dibromo-3-Chloropropane	ND		1000	120	ug/L			06/24/15 23:51	100
1,2-Dibromoethane (EDB)	ND		500	44	ug/L			06/24/15 23:51	100
1,2-Dichlorobenzene	ND		500	28	ug/L			06/24/15 23:51	100
1,2-Dichloroethane	ND		500	37	ug/L			06/24/15 23:51	100
1,2-Dichloropropane	ND		500	32	ug/L			06/24/15 23:51	100
1,3,5-Trichlorobenzene	ND		500	51	ug/L			06/24/15 23:51	100
1,3,5-Trimethylbenzene	ND		500	28	ug/L			06/24/15 23:51	100
1,3-Dichlorobenzene	ND		500	23	ug/L			06/24/15 23:51	100
1,3-Dichloropropane	ND		500	24	ug/L			06/24/15 23:51	100
1,4-Dichlorobenzene	**280**	**J**	500	35	ug/L			06/24/15 23:51	100
2,2-Dichloropropane	ND		500	54	ug/L			06/24/15 23:51	100
2-Chlorotoluene	ND		500	34	ug/L			06/24/15 23:51	100
2-Hexanone	**8600**		2000	59	ug/L			06/24/15 23:51	100
4-Chlorotoluene	ND		500	31	ug/L			06/24/15 23:51	100
4-Isopropyltoluene	**270**	**J**	500	32	ug/L			06/24/15 23:51	100
4-Methyl-2-pentanone (MIBK)	**3300**		2000	33	ug/L			06/24/15 23:51	100

Client Sample ID: TEST 2 STAGE 1-H2O WASH
Date Collected: 06/18/15 22:00
Date Received: 06/19/15 08:45

Lab Sample ID: 160-12404-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS - DL (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acrylonitrile	ND		5000	170	ug/L			06/24/15 23:51	100
Benzene	**2000**		500	25	ug/L			06/24/15 23:51	100
Bromochloromethane	ND		500	55	ug/L			06/24/15 23:51	100
Bromodichloromethane	ND		500	25	ug/L			06/24/15 23:51	100
Bromoform	ND		500	37	ug/L			06/24/15 23:51	100
Bromomethane	ND		1000	40	ug/L			06/24/15 23:51	100
Carbon disulfide	ND		500	37	ug/L			06/24/15 23:51	100
Carbon tetrachloride	ND		500	36	ug/L			06/24/15 23:51	100
Chlorobenzene	ND		500	38	ug/L			06/24/15 23:51	100
Chloroethane	ND		1000	38	ug/L			06/24/15 23:51	100
Chloroform	ND		500	15	ug/L			06/24/15 23:51	100
Chloromethane	ND		1000	55	ug/L			06/24/15 23:51	100
cis-1,2-Dichloroethene	ND		500	16	ug/L			06/24/15 23:51	100
cis-1,3-Dichloropropene	ND		500	34	ug/L			06/24/15 23:51	100
Cyclohexane	ND		1000	36	ug/L			06/24/15 23:51	100
Dibromochloromethane	ND		500	33	ug/L			06/24/15 23:51	100
Dibromomethane	ND		500	41	ug/L			06/24/15 23:51	100
Dichlorodifluoromethane	ND		1000	45	ug/L			06/24/15 23:51	100
Ethylbenzene	**110**	**J**	500	30	ug/L			06/24/15 23:51	100
Isopropylbenzene	ND		500	26	ug/L			06/24/15 23:51	100
Methyl acetate	**96000**		2500	230	ug/L			06/24/15 23:51	100
Methyl tert-butyl ether	ND		500	40	ug/L			06/24/15 23:51	100
Methylcyclohexane	ND		1000	26	ug/L			06/24/15 23:51	100
Methylene Chloride	ND		500	170	ug/L			06/24/15 23:51	100
m-Xylene & p-Xylene	**220**	**J**	500	57	ug/L			06/24/15 23:51	100
n-Butylbenzene	ND		500	23	ug/L			06/24/15 23:51	100
N-Propylbenzene	ND		500	30	ug/L			06/24/15 23:51	100
o-Xylene	**140**	**J**	500	32	ug/L			06/24/15 23:51	100
sec-Butylbenzene	ND		500	31	ug/L			06/24/15 23:51	100
Styrene	ND		500	35	ug/L			06/24/15 23:51	100
tert-Butylbenzene	ND		500	31	ug/L			06/24/15 23:51	100
Tetrachloroethene	ND		500	28	ug/L			06/24/15 23:51	100
Toluene	**310**	**J**	500	100	ug/L			06/24/15 23:51	100
trans-1,2-Dichloroethene	ND		500	18	ug/L			06/24/15 23:51	100
trans-1,3-Dichloropropene	ND		500	35	ug/L			06/24/15 23:51	100
Trichloroethene	ND		500	29	ug/L			06/24/15 23:51	100
Trichlorofluoromethane	ND		500	22	ug/L			06/24/15 23:51	100
Vinyl chloride	ND		500	43	ug/L			06/24/15 23:51	100
Xylenes, Total	**360**	**J**	1000	85	ug/L			06/24/15 23:51	100

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Dimethyl sulfide	*9300*	*T J N*	*ug/L*		*3.84*	*75-18-3*		*06/24/15 23:51*	*100*
Disulfide, dimethyl	*1400*	*T J N*	*ug/L*		*10.04*	*624-92-0*		*06/24/15 23:51*	*100*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*78 - 127*		*06/24/15 23:51*	*100*
4-Bromofluorobenzene (Surr)	*95*		*75 - 123*		*06/24/15 23:51*	*100*
Dibromofluoromethane (Surr)	*102*		*80 - 120*		*06/24/15 23:51*	*100*
Toluene-d8 (Surr)	*92*		*80 - 120*		*06/24/15 23:51*	*100*

Client Sample ID: TEST 2 STAGE 1-H2O WASH

Date Collected: 06/18/15 22:00
Date Received: 06/19/15 08:45

Lab Sample ID: 160-12404-2

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS - DL2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone (MEK)	**250000**		100000	2000	ug/L			06/25/15 01:30	5000
Acetone	**550000**		100000	33000	ug/L			06/25/15 01:30	5000

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*06/25/15 01:30*	*5000*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*78 - 127*		*06/25/15 01:30*	*5000*
4-Bromofluorobenzene (Surr)	*100*		*75 - 123*		*06/25/15 01:30*	*5000*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*06/25/15 01:30*	*5000*
Toluene-d8 (Surr)	*97*		*80 - 120*		*06/25/15 01:30*	*5000*

Method: 8260C - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.050	0.0037	mg/L			06/22/15 19:55	1
1,2-Dichloroethane	ND		0.050	0.0037	mg/L			06/22/15 19:55	1
Benzene	**1.6**		0.050	0.0025	mg/L			06/22/15 19:55	1
Carbon tetrachloride	ND		0.050	0.0036	mg/L			06/22/15 19:55	1
Chlorobenzene	**0.013**	**J**	0.050	0.0038	mg/L			06/22/15 19:55	1
Chloroform	**0.020**	**J**	0.050	0.00092	mg/L			06/22/15 19:55	1
Tetrachloroethene	ND		0.050	0.0028	mg/L			06/22/15 19:55	1
Trichloroethene	ND		0.050	0.0029	mg/L			06/22/15 19:55	1
Vinyl chloride	ND		0.10	0.0043	mg/L			06/22/15 19:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*84 - 120*		*06/22/15 19:55*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*83 - 117*		*06/22/15 19:55*	*1*
Toluene-d8 (Surr)	*98*		*85 - 115*		*06/22/15 19:55*	*1*
Dibromofluoromethane (Surr)	*94*		*85 - 115*		*06/22/15 19:55*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS - TCLP - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone (MEK)	**250**		10	0.78	mg/L			06/23/15 01:42	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*84 - 120*		*06/23/15 01:42*	*200*
1,2-Dichloroethane-d4 (Surr)	*92*		*83 - 117*		*06/23/15 01:42*	*200*
Toluene-d8 (Surr)	*96*		*85 - 115*		*06/23/15 01:42*	*200*
Dibromofluoromethane (Surr)	*92*		*85 - 115*		*06/23/15 01:42*	*200*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
1,2-Dichlorobenzene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
1,3-Dichlorobenzene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
1,4-Dichlorobenzene	**180**	**J**	500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
1,4-Dioxane	**7400**		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
2,4,5-Trichlorophenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
2,4,6-Trichlorophenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
2,4-Dichlorophenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
2,4-Dimethylphenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5

Client Sample ID: TEST 2 STAGE 1-H2O WASH
Date Collected: 06/18/15 22:00
Date Received: 06/19/15 08:45

Lab Sample ID: 160-12404-2
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-Dinitrophenol	ND		2500	100	ug/L		06/25/15 16:18	06/29/15 15:44	5
2,4-Dinitrotoluene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
2,6-Dinitrotoluene	ND		500	110	ug/L		06/25/15 16:18	06/29/15 15:44	5
2-Chloronaphthalene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
2-Chlorophenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
2-Methylnaphthalene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
2-Methylphenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
2-Nitroaniline	ND		500	55	ug/L		06/25/15 16:18	06/29/15 15:44	5
2-Nitrophenol	ND		500	76	ug/L		06/25/15 16:18	06/29/15 15:44	5
3 & 4 Methylphenol	**480**	**J**	1000	100	ug/L		06/25/15 16:18	06/29/15 15:44	5
3,3'-Dichlorobenzidine	ND		2500	65	ug/L		06/25/15 16:18	06/29/15 15:44	5
3-Nitroaniline	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
4,6-Dinitro-2-methylphenol	ND		500	63	ug/L		06/25/15 16:18	06/29/15 15:44	5
4-Bromophenyl phenyl ether	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
4-Chloro-3-methylphenol	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
4-Chloroaniline	ND	*	500	100	ug/L		06/25/15 16:18	06/29/15 15:44	5
4-Chlorophenyl phenyl ether	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
4-Nitroaniline	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
4-Nitrophenol	ND	*	500	100	ug/L		06/25/15 16:18	06/29/15 15:44	5
Acenaphthene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Acenaphthylene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Aniline	ND		500	64	ug/L		06/25/15 16:18	06/29/15 15:44	5
Anthracene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Benzo[a]anthracene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Benzo[a]pyrene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Benzo[b]fluoranthene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Benzo[g,h,i]perylene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Benzo[k]fluoranthene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Benzyl alcohol	ND		500	150	ug/L		06/25/15 16:18	06/29/15 15:44	5
bis (2-chloroisopropyl) ether	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Bis(2-chloroethoxy)methane	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Bis(2-chloroethyl)ether	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Bis(2-ethylhexyl) phthalate	ND		500	93	ug/L		06/25/15 16:18	06/29/15 15:44	5
Butyl benzyl phthalate	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Carbazole	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Chrysene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Dibenz(a,h)anthracene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Dibenzofuran	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Diethyl phthalate	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Dimethyl phthalate	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Di-n-butyl phthalate	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Di-n-octyl phthalate	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Diphenylamine	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Fluoranthene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Fluorene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Hexachlorobenzene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Hexachlorobutadiene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Hexachlorocyclopentadiene	ND	*	500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Hexachloroethane	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5

Client Sample ID: TEST 2 STAGE 1-H2O WASH

Date Collected: 06/18/15 22:00
Date Received: 06/19/15 08:45

Lab Sample ID: 160-12404-2

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Indeno[1,2,3-cd]pyrene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Isophorone	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Naphthalene	**250**	**J**	500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Nitrobenzene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
N-Nitrosodi-n-propylamine	ND		500	75	ug/L		06/25/15 16:18	06/29/15 15:44	5
Pentachlorophenol	ND		500	64	ug/L		06/25/15 16:18	06/29/15 15:44	5
Phenanthrene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Phenol	**710**		500	100	ug/L		06/25/15 16:18	06/29/15 15:44	5
Pyrene	ND		500	50	ug/L		06/25/15 16:18	06/29/15 15:44	5
Pyridine	ND		1000	100	ug/L		06/25/15 16:18	06/29/15 15:44	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*58*		*47 - 103*	*06/25/15 16:18*	*06/29/15 15:44*	*5*
2-Fluorobiphenyl (Surr)	*70*		*30 - 99*	*06/25/15 16:18*	*06/29/15 15:44*	*5*
2-Fluorophenol (Surr)	*46*		*10 - 74*	*06/25/15 16:18*	*06/29/15 15:44*	*5*
Nitrobenzene-d5 (Surr)	*137*	*X*	*31 - 105*	*06/25/15 16:18*	*06/29/15 15:44*	*5*
Phenol-d5 (Surr)	*44*		*10 - 50*	*06/25/15 16:18*	*06/29/15 15:44*	*5*
Terphenyl-d14 (Surr)	*60*	*X*	*68 - 116*	*06/25/15 16:18*	*06/29/15 15:44*	*5*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	**0.15**	**J**	0.25	0.025	mg/L		06/25/15 15:57	06/29/15 17:43	5
2,4-Dinitrotoluene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 17:43	5
Hexachlorobenzene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 17:43	5
Hexachlorobutadiene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 17:43	5
Hexachloroethane	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 17:43	5
2-Methylphenol	**0.060**	**J**	0.25	0.050	mg/L		06/25/15 15:57	06/29/15 17:43	5
3 & 4 Methylphenol	**0.58**		0.50	0.025	mg/L		06/25/15 15:57	06/29/15 17:43	5
Nitrobenzene	ND		0.25	0.025	mg/L		06/25/15 15:57	06/29/15 17:43	5
Pentachlorophenol	ND		1.3	0.050	mg/L		06/25/15 15:57	06/29/15 17:43	5
Pyridine	ND		0.50	0.13	mg/L		06/25/15 15:57	06/29/15 17:43	5
2,4,5-Trichlorophenol	ND		0.25	0.050	mg/L		06/25/15 15:57	06/29/15 17:43	5
2,4,6-Trichlorophenol	ND		0.25	0.050	mg/L		06/25/15 15:57	06/29/15 17:43	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*69*		*49 - 100*	*06/25/15 15:57*	*06/29/15 17:43*	*5*
Nitrobenzene-d5 (Surr)	*222*	*X*	*51 - 98*	*06/25/15 15:57*	*06/29/15 17:43*	*5*
Phenol-d5 (Surr)	*75*		*37 - 95*	*06/25/15 15:57*	*06/29/15 17:43*	*5*
Terphenyl-d14 (Surr)	*67*		*60 - 113*	*06/25/15 15:57*	*06/29/15 17:43*	*5*
2-Fluorobiphenyl (Surr)	*77*		*45 - 94*	*06/25/15 15:57*	*06/29/15 17:43*	*5*
2-Fluorophenol (Surr)	*150*	*X*	*46 - 92*	*06/25/15 15:57*	*06/29/15 17:43*	*5*

Method: 8081B - Organochlorine Pesticides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
gamma-BHC (Lindane)	ND	*	0.00050	0.000015	mg/L		06/25/15 14:37	06/27/15 09:58	1
Endrin	ND	*	0.00050	0.000050	mg/L		06/25/15 14:37	06/27/15 09:58	1
Heptachlor	ND		0.00050	0.000015	mg/L		06/25/15 14:37	06/27/15 09:58	1
Heptachlor epoxide	ND	*	0.00050	0.000050	mg/L		06/25/15 14:37	06/27/15 09:58	1
Methoxychlor	ND		0.0010	0.000050	mg/L		06/25/15 14:37	06/27/15 09:58	1
Technical Chlordane	ND		0.0050	0.00020	mg/L		06/25/15 14:37	06/27/15 09:58	1

Client Sample ID: TEST 2 STAGE 1-H2O WASH

Lab Sample ID: 160-12404-2

Date Collected: 06/18/15 22:00

Matrix: Water

Date Received: 06/19/15 08:45

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	93		43 - 131	06/25/15 14:37	06/27/15 09:58	1
Tetrachloro-m-xylene	124	X	44 - 115	06/25/15 14:37	06/27/15 09:58	1

Method: 8081B - Organochlorine Pesticides (GC) - TCLP - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	**0.0030**	**J p**	0.020	0.000050	mg/L		06/25/15 14:37	07/01/15 13:44	1

Method: 8151A - Herbicides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	ND		0.040	0.020	mg/L		06/25/15 16:06	06/29/15 13:15	1
Silvex (2,4,5-TP)	ND		0.010	0.0030	mg/L		06/25/15 16:06	06/29/15 13:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	111		56 - 147	06/25/15 16:06	06/29/15 13:15	1

Method: 300.0 - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	**1.4**		0.40	0.080	mg/L			06/20/15 06:59	20
Sulfate	**73**		10	1.0	mg/L			06/20/15 06:59	20
Chloride	**19**		4.0	0.40	mg/L			06/20/15 06:59	20
Nitrite as N	ND	F1	0.40	0.060	mg/L			06/20/15 06:59	20

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		20	7.5	ug/L		06/24/15 14:36	06/30/15 10:36	1
Arsenic	**48**	**B**	20	3.6	ug/L		06/24/15 14:36	06/30/15 10:36	1
Barium	**35**	**J**	100	4.2	ug/L		06/24/15 14:36	06/30/15 10:36	1
Boron	**60**	**J B**	100	14	ug/L		06/24/15 14:36	06/30/15 10:36	1
Cadmium	ND		10	0.67	ug/L		06/24/15 14:36	06/30/15 10:36	1
Calcium	**28000**	**B**	2000	110	ug/L		06/24/15 14:36	06/30/15 10:36	1
Chromium	**36**		20	6.7	ug/L		06/24/15 14:36	06/30/15 10:36	1
Copper	**51**		50	4.2	ug/L		06/24/15 14:36	06/30/15 10:36	1
Iron	**640**	**B**	200	26	ug/L		06/24/15 14:36	06/30/15 10:36	1
Lead	**10**	**J B**	20	1.2	ug/L		06/24/15 14:36	06/30/15 10:36	1
Magnesium	**6700**		2000	100	ug/L		06/24/15 14:36	06/30/15 10:36	1
Manganese	**57**		30	2.0	ug/L		06/24/15 14:36	06/30/15 10:36	1
Molybdenum	ND		80	3.8	ug/L		06/24/15 14:36	06/30/15 10:36	1
Nickel	**190**		80	5.1	ug/L		06/24/15 14:36	06/30/15 10:36	1
Potassium	**5200**	**J**	10000	910	ug/L		06/24/15 14:36	06/30/15 10:36	1
Selenium	ND		30	4.2	ug/L		06/24/15 14:36	06/30/15 10:36	1
Silver	ND		20	2.0	ug/L		06/24/15 14:36	06/30/15 10:36	1
Sodium	**25000**		2000	210	ug/L		06/24/15 14:36	06/30/15 10:36	1
Strontium	**150**	**B**	10	0.47	ug/L		06/24/15 14:36	06/30/15 10:36	1
Sulfur	**35000**		10000	530	ug/L		06/24/15 14:36	06/30/15 10:36	1
Zinc	**43**		40	17	ug/L		06/24/15 14:36	06/30/15 10:36	1

Method: 6010C - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.044**	**J**	0.50	0.0045	mg/L		06/24/15 14:33	06/30/15 11:34	1
Barium	**0.029**	**J**	0.13	0.0053	mg/L		06/24/15 14:33	06/30/15 11:34	1
Cadmium	ND		0.013	0.00084	mg/L		06/24/15 14:33	06/30/15 11:34	1

Client Sample ID: TEST 2 STAGE 1-H2O WASH
Date Collected: 06/18/15 22:00
Date Received: 06/19/15 08:45

Lab Sample ID: 160-12404-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**0.030**		0.025	0.0084	mg/L		06/24/15 14:33	06/30/15 11:34	1
Lead	**0.0068**	**J**	0.25	0.0015	mg/L		06/24/15 14:33	06/30/15 11:34	1
Selenium	ND		0.50	0.0052	mg/L		06/24/15 14:33	06/30/15 11:34	1
Silver	ND		0.025	0.0025	mg/L		06/24/15 14:33	06/30/15 11:34	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.70**		0.20	0.060	ug/L		06/23/15 08:40	06/23/15 14:31	1

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.0018**	**B**	0.0010	0.000079	mg/L		06/23/15 08:38	06/23/15 14:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fats, Oils or Grease	**1.4**	**J**	3.7	1.3	mg/L		06/29/15 10:17	06/29/15 10:17	1
Cyanide, Total	ND		0.010	0.0070	mg/L		06/23/15 17:52	06/24/15 10:10	1
Ammonia	**1.5**		1.0	0.60	mg/L		06/26/15 17:15	06/27/15 07:38	1
Kjeldahl Nitrogen as N	**74**	**B**	5.0	1.2	mg/L		06/26/15 15:31	06/28/15 08:58	1
Phosphorus, Total	**4.0**		2.0	1.0	mg/L		06/30/15 02:37	07/01/15 12:05	1
Bicarbonate Alkalinity as CaCO3	**90**		10	5.0	mg/L			06/22/15 13:17	1
Alkalinity	**90**		10	5.0	mg/L			06/22/15 13:17	1
Total Dissolved Solids	**230**		10	7.0	mg/L			06/23/15 11:00	1
Total Suspended Solids	ND		1.0	0.70	mg/L			06/23/15 13:30	1
Chlorine, Total Residual	ND	HF	0.10	0.040	mg/L			06/29/15 15:48	1
pH	**4.96**	**HF**	0.100	0.100	SU			06/22/15 13:43	1
Sulfide, Dissolved	**5.0**		1.0	0.50	mg/L			06/24/15 20:00	1
Total Sulfide	**5.0**		1.0	0.50	mg/L			06/24/15 20:00	1
Sulfite	**10**	**HF**	5.0	2.5	mg/L			07/01/15 09:54	1
Chemical Oxygen Demand	**21000**		4000	800	mg/L			06/29/15 08:59	200
Biochemical Oxygen Demand	**>3000**		100	100	mg/L			06/20/15 12:30	50

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 160-197153/13
Matrix: Water
Analysis Batch: 197153

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	0.25	ug/L			06/24/15 22:12	1
1,1,1-Trichloroethane	ND		5.0	0.29	ug/L			06/24/15 22:12	1
1,1,2,2-Tetrachloroethane	ND		5.0	0.43	ug/L			06/24/15 22:12	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.0	0.25	ug/L			06/24/15 22:12	1
1,1,2-Trichloroethane	ND		5.0	0.57	ug/L			06/24/15 22:12	1
1,1-Dichloroethane	ND		5.0	0.39	ug/L			06/24/15 22:12	1
1,1-Dichloroethene	ND		5.0	0.37	ug/L			06/24/15 22:12	1
1,1-Dichloropropene	ND		5.0	0.30	ug/L			06/24/15 22:12	1
1,2,3-Trichlorobenzene	ND		5.0	0.65	ug/L			06/24/15 22:12	1
1,2,3-Trichloropropane	ND		5.0	0.56	ug/L			06/24/15 22:12	1
1,2,4-Trichlorobenzene	ND		5.0	0.55	ug/L			06/24/15 22:12	1
1,2,4-Trimethylbenzene	ND		5.0	0.40	ug/L			06/24/15 22:12	1
1,2-Dibromo-3-Chloropropane	ND		10	1.2	ug/L			06/24/15 22:12	1
1,2-Dibromoethane (EDB)	ND		5.0	0.44	ug/L			06/24/15 22:12	1
1,2-Dichlorobenzene	ND		5.0	0.28	ug/L			06/24/15 22:12	1
1,2-Dichloroethane	ND		5.0	0.37	ug/L			06/24/15 22:12	1
1,2-Dichloropropane	ND		5.0	0.32	ug/L			06/24/15 22:12	1
1,3,5-Trichlorobenzene	ND		5.0	0.51	ug/L			06/24/15 22:12	1
1,3,5-Trimethylbenzene	ND		5.0	0.28	ug/L			06/24/15 22:12	1
1,3-Dichlorobenzene	ND		5.0	0.23	ug/L			06/24/15 22:12	1
1,3-Dichloropropane	ND		5.0	0.24	ug/L			06/24/15 22:12	1
1,4-Dichlorobenzene	ND		5.0	0.35	ug/L			06/24/15 22:12	1
2,2-Dichloropropane	ND		5.0	0.54	ug/L			06/24/15 22:12	1
2-Butanone (MEK)	ND		20	0.39	ug/L			06/24/15 22:12	1
2-Chlorotoluene	ND		5.0	0.34	ug/L			06/24/15 22:12	1
2-Hexanone	ND		20	0.59	ug/L			06/24/15 22:12	1
4-Chlorotoluene	ND		5.0	0.31	ug/L			06/24/15 22:12	1
4-Isopropyltoluene	ND		5.0	0.32	ug/L			06/24/15 22:12	1
4-Methyl-2-pentanone (MIBK)	ND		20	0.33	ug/L			06/24/15 22:12	1
Acetone	ND		20	6.7	ug/L			06/24/15 22:12	1
Acrylonitrile	ND		50	1.7	ug/L			06/24/15 22:12	1
Benzene	ND		5.0	0.25	ug/L			06/24/15 22:12	1
Bromochloromethane	ND		5.0	0.55	ug/L			06/24/15 22:12	1
Bromodichloromethane	ND		5.0	0.25	ug/L			06/24/15 22:12	1
Bromoform	ND		5.0	0.37	ug/L			06/24/15 22:12	1
Bromomethane	ND		10	0.40	ug/L			06/24/15 22:12	1
Carbon disulfide	ND		5.0	0.37	ug/L			06/24/15 22:12	1
Carbon tetrachloride	ND		5.0	0.36	ug/L			06/24/15 22:12	1
Chlorobenzene	ND		5.0	0.38	ug/L			06/24/15 22:12	1
Chloroethane	ND		10	0.38	ug/L			06/24/15 22:12	1
Chloroform	ND		5.0	0.15	ug/L			06/24/15 22:12	1
Chloromethane	ND		10	0.55	ug/L			06/24/15 22:12	1
cis-1,2-Dichloroethene	ND		5.0	0.16	ug/L			06/24/15 22:12	1
cis-1,3-Dichloropropene	ND		5.0	0.34	ug/L			06/24/15 22:12	1
Cyclohexane	ND		10	0.36	ug/L			06/24/15 22:12	1
Dibromochloromethane	ND		5.0	0.33	ug/L			06/24/15 22:12	1
Dibromomethane	ND		5.0	0.41	ug/L			06/24/15 22:12	1
Dichlorodifluoromethane	ND		10	0.45	ug/L			06/24/15 22:12	1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 160-197153/13
Matrix: Water
Analysis Batch: 197153

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		5.0	0.30	ug/L			06/24/15 22:12	1
Isopropylbenzene	ND		5.0	0.26	ug/L			06/24/15 22:12	1
Methyl acetate	ND		25	2.3	ug/L			06/24/15 22:12	1
Methyl tert-butyl ether	ND		5.0	0.40	ug/L			06/24/15 22:12	1
Methylcyclohexane	ND		10	0.26	ug/L			06/24/15 22:12	1
Methylene Chloride	ND		5.0	1.7	ug/L			06/24/15 22:12	1
m-Xylene & p-Xylene	ND		5.0	0.57	ug/L			06/24/15 22:12	1
n-Butylbenzene	ND		5.0	0.23	ug/L			06/24/15 22:12	1
N-Propylbenzene	ND		5.0	0.30	ug/L			06/24/15 22:12	1
o-Xylene	ND		5.0	0.32	ug/L			06/24/15 22:12	1
sec-Butylbenzene	ND		5.0	0.31	ug/L			06/24/15 22:12	1
Styrene	ND		5.0	0.35	ug/L			06/24/15 22:12	1
tert-Butylbenzene	ND		5.0	0.31	ug/L			06/24/15 22:12	1
Tetrachloroethene	ND		5.0	0.28	ug/L			06/24/15 22:12	1
Toluene	ND		5.0	1.0	ug/L			06/24/15 22:12	1
trans-1,2-Dichloroethene	ND		5.0	0.18	ug/L			06/24/15 22:12	1
trans-1,3-Dichloropropene	ND		5.0	0.35	ug/L			06/24/15 22:12	1
Trichloroethene	ND		5.0	0.29	ug/L			06/24/15 22:12	1
Trichlorofluoromethane	ND		5.0	0.22	ug/L			06/24/15 22:12	1
Vinyl chloride	ND		5.0	0.43	ug/L			06/24/15 22:12	1
Xylenes, Total	ND		10	0.85	ug/L			06/24/15 22:12	1

Tentatively Identified Compound	*MB Est. Result*	*MB Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*06/24/15 22:12*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*78 - 127*		*06/24/15 22:12*	*1*
4-Bromofluorobenzene (Surr)	*96*		*75 - 123*		*06/24/15 22:12*	*1*
Dibromofluoromethane (Surr)	*112*		*80 - 120*		*06/24/15 22:12*	*1*
Toluene-d8 (Surr)	*96*		*80 - 120*		*06/24/15 22:12*	*1*

Lab Sample ID: LCS 160-197153/10
Matrix: Water
Analysis Batch: 197153

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	50.0	50.0		ug/L		100	80 - 120
1,1,1-Trichloroethane	50.0	56.0		ug/L		112	75 - 127
1,1,2,2-Tetrachloroethane	50.0	45.9		ug/L		92	80 - 120
1,1,2-Trichloro-1,2,2-trifluoroethane	50.0	52.9		ug/L		106	80 - 120
1,1,2-Trichloroethane	50.0	46.7		ug/L		93	80 - 120
1,1-Dichloroethane	50.0	51.1		ug/L		102	80 - 120
1,1-Dichloroethene	50.0	53.0		ug/L		106	77 - 121
1,1-Dichloropropene	50.0	50.8		ug/L		102	80 - 120
1,2,3-Trichlorobenzene	50.0	48.4		ug/L		97	75 - 130
1,2,3-Trichloropropane	50.0	51.5		ug/L		103	80 - 120
1,2,4-Trichlorobenzene	50.0	49.9		ug/L		100	82 - 124

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 160-197153/10
Matrix: Water
Analysis Batch: 197153

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,4-Trimethylbenzene	50.0	52.5		ug/L		105	84 - 122
1,2-Dibromo-3-Chloropropane	50.0	44.8		ug/L		90	69 - 135
1,2-Dibromoethane (EDB)	50.0	51.2		ug/L		102	80 - 120
1,2-Dichlorobenzene	50.0	49.4		ug/L		99	76 - 122
1,2-Dichloroethane	50.0	55.1		ug/L		110	80 - 120
1,2-Dichloropropane	50.0	47.9		ug/L		96	80 - 120
1,3,5-Trimethylbenzene	50.0	51.8		ug/L		104	87 - 123
1,3-Dichlorobenzene	50.0	49.9		ug/L		100	77 - 122
1,3-Dichloropropane	50.0	49.7		ug/L		99	80 - 120
1,4-Dichlorobenzene	50.0	48.8		ug/L		98	80 - 120
2,2-Dichloropropane	50.0	55.5		ug/L		111	73 - 134
2-Butanone (MEK)	50.0	46.6		ug/L		93	68 - 128
2-Chlorotoluene	50.0	50.0		ug/L		100	80 - 122
2-Hexanone	50.0	42.9		ug/L		86	64 - 136
4-Chlorotoluene	50.0	50.9		ug/L		102	80 - 122
4-Isopropyltoluene	50.0	51.0		ug/L		102	85 - 125
4-Methyl-2-pentanone (MIBK)	50.0	46.2		ug/L		92	74 - 129
Acetone	50.0	41.5		ug/L		83	72 - 139
Acrylonitrile	500	476		ug/L		95	80 - 120
Benzene	50.0	47.6		ug/L		95	80 - 120
Bromochloromethane	50.0	52.1		ug/L		104	80 - 120
Bromodichloromethane	50.0	55.7		ug/L		111	80 - 120
Bromoform	50.0	52.2		ug/L		104	80 - 120
Bromomethane	50.0	42.8		ug/L		86	48 - 140
Carbon disulfide	50.0	50.1		ug/L		100	79 - 120
Carbon tetrachloride	50.0	57.3		ug/L		115	74 - 128
Chlorobenzene	50.0	50.1		ug/L		100	80 - 120
Chloroethane	50.0	50.6		ug/L		101	55 - 140
Chloroform	50.0	52.7		ug/L		105	80 - 120
Chloromethane	50.0	40.8		ug/L		82	72 - 123
cis-1,2-Dichloroethene	50.0	47.4		ug/L		95	80 - 120
cis-1,3-Dichloropropene	50.0	52.2		ug/L		104	80 - 120
Cyclohexane	50.0	49.2		ug/L		98	77 - 127
Dibromochloromethane	50.0	53.1		ug/L		106	80 - 120
Dibromomethane	50.0	53.5		ug/L		107	80 - 120
Dichlorodifluoromethane	50.0	50.9		ug/L		102	49 - 140
Ethylbenzene	50.0	52.9		ug/L		106	80 - 120
Isopropylbenzene	50.0	50.6		ug/L		101	80 - 127
Methyl acetate	250	236		ug/L		94	66 - 132
Methyl tert-butyl ether	50.0	49.0		ug/L		98	77 - 124
Methylcyclohexane	50.0	49.3		ug/L		99	75 - 131
Methylene Chloride	50.0	50.5		ug/L		101	79 - 115
m-Xylene & p-Xylene	50.0	49.2		ug/L		98	80 - 120
n-Butylbenzene	50.0	50.3		ug/L		101	87 - 123
N-Propylbenzene	50.0	51.3		ug/L		103	79 - 125
o-Xylene	50.0	47.8		ug/L		96	79 - 126
sec-Butylbenzene	50.0	51.0		ug/L		102	80 - 123
Styrene	50.0	49.5		ug/L		99	80 - 120

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 160-197153/10
Matrix: Water
Analysis Batch: 197153

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
tert-Butylbenzene	50.0	51.9		ug/L		104	78 - 128
Tetrachloroethene	50.0	48.4		ug/L		97	80 - 120
Toluene	50.0	48.0		ug/L		96	80 - 120
trans-1,2-Dichloroethene	50.0	49.7		ug/L		99	80 - 120
trans-1,3-Dichloropropene	50.0	54.4		ug/L		109	80 - 120
Trichloroethene	50.0	48.0		ug/L		96	80 - 120
Trichlorofluoromethane	50.0	56.4		ug/L		113	72 - 132
Vinyl chloride	50.0	39.8		ug/L		80	68 - 120
Xylenes, Total	100	97.0		ug/L		97	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*114*		*78 - 127*
4-Bromofluorobenzene (Surr)	*99*		*75 - 123*
Dibromofluoromethane (Surr)	*104*		*80 - 120*
Toluene-d8 (Surr)	*101*		*80 - 120*

Lab Sample ID: LCSD 160-197153/11
Matrix: Water
Analysis Batch: 197153

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1,2-Tetrachloroethane	50.0	53.0		ug/L		106	80 - 120	6	20
1,1,1-Trichloroethane	50.0	56.9		ug/L		114	75 - 127	2	20
1,1,2,2-Tetrachloroethane	50.0	44.4		ug/L		89	80 - 120	3	20
1,1,2-Trichloro-1,2,2-trifluoroethane	50.0	53.8		ug/L		108	80 - 120	2	20
1,1,2-Trichloroethane	50.0	49.5		ug/L		99	80 - 120	6	20
1,1-Dichloroethane	50.0	50.0		ug/L		100	80 - 120	2	20
1,1-Dichloroethene	50.0	52.6		ug/L		105	77 - 121	1	20
1,1-Dichloropropene	50.0	51.7		ug/L		103	80 - 120	2	20
1,2,3-Trichlorobenzene	50.0	47.8		ug/L		96	75 - 130	1	20
1,2,3-Trichloropropane	50.0	51.5		ug/L		103	80 - 120	0	20
1,2,4-Trichlorobenzene	50.0	48.1		ug/L		96	82 - 124	4	20
1,2,4-Trimethylbenzene	50.0	51.6		ug/L		103	84 - 122	2	20
1,2-Dibromo-3-Chloropropane	50.0	41.4		ug/L		83	69 - 135	8	20
1,2-Dibromoethane (EDB)	50.0	49.2		ug/L		98	80 - 120	4	20
1,2-Dichlorobenzene	50.0	50.0		ug/L		100	76 - 122	1	20
1,2-Dichloroethane	50.0	54.5		ug/L		109	80 - 120	1	20
1,2-Dichloropropane	50.0	47.0		ug/L		94	80 - 120	2	20
1,3,5-Trimethylbenzene	50.0	52.1		ug/L		104	87 - 123	1	20
1,3-Dichlorobenzene	50.0	48.8		ug/L		98	77 - 122	2	20
1,3-Dichloropropane	50.0	49.5		ug/L		99	80 - 120	0	20
1,4-Dichlorobenzene	50.0	47.7		ug/L		95	80 - 120	2	20
2,2-Dichloropropane	50.0	54.8		ug/L		110	73 - 134	1	20
2-Butanone (MEK)	50.0	47.7		ug/L		95	68 - 128	2	20
2-Chlorotoluene	50.0	51.1		ug/L		102	80 - 122	2	20
2-Hexanone	50.0	41.0		ug/L		82	64 - 136	5	20
4-Chlorotoluene	50.0	50.2		ug/L		100	80 - 122	1	20

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 160-197153/11
Matrix: Water
Analysis Batch: 197153

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4-Isopropyltoluene			50.0	51.5		ug/L		103	85 - 125	1	20
4-Methyl-2-pentanone (MIBK)			50.0	48.1		ug/L		96	74 - 129	4	20
Acetone			50.0	48.0		ug/L		96	72 - 139	14	20
Acrylonitrile			500	448		ug/L		90	80 - 120	6	20
Benzene			50.0	47.1		ug/L		94	80 - 120	1	20
Bromochloromethane			50.0	50.7		ug/L		101	80 - 120	3	20
Bromodichloromethane			50.0	53.1		ug/L		106	80 - 120	5	20
Bromoform			50.0	50.4		ug/L		101	80 - 120	4	20
Bromomethane			50.0	51.7		ug/L		103	48 - 140	19	20
Carbon disulfide			50.0	51.4		ug/L		103	79 - 120	3	20
Carbon tetrachloride			50.0	58.0		ug/L		116	74 - 128	1	20
Chlorobenzene			50.0	50.7		ug/L		101	80 - 120	1	20
Chloroethane			50.0	50.0		ug/L		100	55 - 140	1	20
Chloroform			50.0	53.3		ug/L		107	80 - 120	1	20
Chloromethane			50.0	47.4		ug/L		95	72 - 123	15	20
cis-1,2-Dichloroethene			50.0	47.8		ug/L		96	80 - 120	1	20
cis-1,3-Dichloropropene			50.0	50.0		ug/L		100	80 - 120	4	20
Cyclohexane			50.0	50.1		ug/L		100	77 - 127	2	20
Dibromochloromethane			50.0	51.9		ug/L		104	80 - 120	2	20
Dibromomethane			50.0	52.5		ug/L		105	80 - 120	2	20
Dichlorodifluoromethane			50.0	52.5		ug/L		105	49 - 140	3	20
Ethylbenzene			50.0	54.1		ug/L		108	80 - 120	2	20
Isopropylbenzene			50.0	52.1		ug/L		104	80 - 127	3	20
Methyl acetate			250	227		ug/L		91	66 - 132	4	20
Methyl tert-butyl ether			50.0	50.4		ug/L		101	77 - 124	3	20
Methylcyclohexane			50.0	49.0		ug/L		98	75 - 131	1	20
Methylene Chloride			50.0	51.6		ug/L		103	79 - 115	2	20
m-Xylene & p-Xylene			50.0	50.1		ug/L		100	80 - 120	2	20
n-Butylbenzene			50.0	51.0		ug/L		102	87 - 123	1	20
N-Propylbenzene			50.0	51.5		ug/L		103	79 - 125	1	20
o-Xylene			50.0	50.8		ug/L		102	79 - 126	6	20
sec-Butylbenzene			50.0	50.5		ug/L		101	80 - 123	1	20
Styrene			50.0	49.5		ug/L		99	80 - 120	0	20
tert-Butylbenzene			50.0	52.6		ug/L		105	78 - 128	1	20
Tetrachloroethene			50.0	51.5		ug/L		103	80 - 120	6	20
Toluene			50.0	47.8		ug/L		96	80 - 120	0	20
trans-1,2-Dichloroethene			50.0	48.2		ug/L		96	80 - 120	3	20
trans-1,3-Dichloropropene			50.0	51.1		ug/L		102	80 - 120	6	20
Trichloroethene			50.0	48.1		ug/L		96	80 - 120	0	20
Trichlorofluoromethane			50.0	58.1		ug/L		116	72 - 132	3	20
Vinyl chloride			50.0	44.8		ug/L		90	68 - 120	12	20
Xylenes, Total			100	101		ug/L		101	80 - 120	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*111*		*78 - 127*
4-Bromofluorobenzene (Surr)	*97*		*75 - 123*
Dibromofluoromethane (Surr)	*107*		*80 - 120*
Toluene-d8 (Surr)	*98*		*80 - 120*

QC Sample Results

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - SOX Treatment

TestAmerica Job ID: 160-12404-1

Lab Sample ID: LB 160-196524/1-A
Matrix: Water
Analysis Batch: 196598

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.050	0.0037	mg/L			06/22/15 18:41	1
1,2-Dichloroethane	ND		0.050	0.0037	mg/L			06/22/15 18:41	1
2-Butanone (MEK)	ND		0.050	0.0039	mg/L			06/22/15 18:41	1
Benzene	ND		0.050	0.0025	mg/L			06/22/15 18:41	1
Carbon tetrachloride	ND		0.050	0.0036	mg/L			06/22/15 18:41	1
Chlorobenzene	ND		0.050	0.0038	mg/L			06/22/15 18:41	1
Chloroform	ND		0.050	0.00092	mg/L			06/22/15 18:41	1
Tetrachloroethene	ND		0.050	0.0028	mg/L			06/22/15 18:41	1
Trichloroethene	ND		0.050	0.0029	mg/L			06/22/15 18:41	1
Vinyl chloride	ND		0.10	0.0043	mg/L			06/22/15 18:41	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*83 - 117*		*06/22/15 18:41*	*1*
4-Bromofluorobenzene (Surr)	*98*		*84 - 120*		*06/22/15 18:41*	*1*
Dibromofluoromethane (Surr)	*100*		*85 - 115*		*06/22/15 18:41*	*1*
Toluene-d8 (Surr)	*92*		*85 - 115*		*06/22/15 18:41*	*1*

Lab Sample ID: 160-12404-1 MS
Matrix: Water
Analysis Batch: 196598

Client Sample ID: TEST 2 STAGE 2 BLEACH
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	ND		0.500	0.549		mg/L		110	80 - 115
1,2-Dichloroethane	ND		0.500	0.480		mg/L		96	85 - 115
Benzene	0.19		0.500	0.678		mg/L		97	85 - 115
Carbon tetrachloride	0.0086	J	0.500	0.501		mg/L		98	79 - 117
Chlorobenzene	ND		0.500	0.516		mg/L		103	85 - 115
Tetrachloroethene	0.46		0.500	0.927		mg/L		93	82 - 115
Trichloroethene	ND		0.500	0.503		mg/L		101	84 - 115
Vinyl chloride	ND		0.500	0.550		mg/L		110	75 - 132

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*83 - 117*
4-Bromofluorobenzene (Surr)	*96*		*84 - 120*
Dibromofluoromethane (Surr)	*97*		*85 - 115*
Toluene-d8 (Surr)	*100*		*85 - 115*

Lab Sample ID: 160-12404-1 MSD
Matrix: Water
Analysis Batch: 196598

Client Sample ID: TEST 2 STAGE 2 BLEACH
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	ND		0.500	0.498		mg/L		100	80 - 115	10	20
1,2-Dichloroethane	ND		0.500	0.464		mg/L		93	85 - 115	3	20
Benzene	0.19		0.500	0.646		mg/L		90	85 - 115	5	20
Carbon tetrachloride	0.0086	J	0.500	0.459		mg/L		90	79 - 117	9	20
Chlorobenzene	ND		0.500	0.502		mg/L		100	85 - 115	3	20
Tetrachloroethene	0.46		0.500	0.895		mg/L		87	82 - 115	4	20
Trichloroethene	ND		0.500	0.488		mg/L		98	84 - 115	3	20
Vinyl chloride	ND		0.500	0.462		mg/L		92	75 - 132	17	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*83 - 117*
4-Bromofluorobenzene (Surr)	*93*		*84 - 120*
Dibromofluoromethane (Surr)	*94*		*85 - 115*
Toluene-d8 (Surr)	*100*		*85 - 115*

Method: 8260C - Volatile Organic Compounds by GC/MS - RA

Lab Sample ID: LCS 160-197849/4
Matrix: Water
Analysis Batch: 197849

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene - RA	0.500	0.542		mg/L		108	79 - 117
1,2-Dichloroethane - RA	0.500	0.449		mg/L		90	80 - 115
2-Butanone (MEK) - RA	0.500	0.503		mg/L		101	64 - 117
Benzene - RA	0.500	0.494		mg/L		99	85 - 115
Carbon tetrachloride - RA	0.500	0.482		mg/L		96	79 - 119
Chlorobenzene - RA	0.500	0.491		mg/L		98	85 - 115
Chloroform - RA	0.500	0.472		mg/L		94	85 - 115
Tetrachloroethene - RA	0.500	0.493		mg/L		99	79 - 116
Trichloroethene - RA	0.500	0.469		mg/L		94	85 - 115
Vinyl chloride - RA	0.500	0.644		mg/L		129	72 - 136

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr) - RA	*91*		*83 - 117*
4-Bromofluorobenzene (Surr) - RA	*95*		*84 - 120*
Dibromofluoromethane (Surr) - RA	*93*		*85 - 115*
Toluene-d8 (Surr) - RA	*99*		*85 - 115*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: LB 160-197372/1-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197372

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	ND		0.050	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
2,4,5-Trichlorophenol	ND		0.050	0.010	mg/L		06/25/15 15:57	06/29/15 13:30	1
2,4,6-Trichlorophenol	ND		0.050	0.010	mg/L		06/25/15 15:57	06/29/15 13:30	1
2,4-Dinitrotoluene	ND		0.050	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
2-Methylphenol	ND		0.050	0.010	mg/L		06/25/15 15:57	06/29/15 13:30	1
3 & 4 Methylphenol	ND		0.10	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
Hexachlorobenzene	ND		0.050	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
Hexachlorobutadiene	ND		0.050	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
Hexachloroethane	ND		0.050	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
Nitrobenzene	ND		0.050	0.0050	mg/L		06/25/15 15:57	06/29/15 13:30	1
Pentachlorophenol	ND		0.25	0.010	mg/L		06/25/15 15:57	06/29/15 13:30	1
Pyridine	ND		0.10	0.025	mg/L		06/25/15 15:57	06/29/15 13:30	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LB 160-197372/1-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197372

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	70		49 - 100	06/25/15 15:57	06/29/15 13:30	1
2-Fluorobiphenyl (Surr)	79		45 - 94	06/25/15 15:57	06/29/15 13:30	1
2-Fluorophenol (Surr)	68		46 - 92	06/25/15 15:57	06/29/15 13:30	1
Nitrobenzene-d5 (Surr)	81		51 - 98	06/25/15 15:57	06/29/15 13:30	1
Phenol-d5 (Surr)	56		37 - 95	06/25/15 15:57	06/29/15 13:30	1
Terphenyl-d14 (Surr)	72		60 - 113	06/25/15 15:57	06/29/15 13:30	1

Lab Sample ID: LCS 160-197372/2-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197372

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dichlorobenzene	1.00	0.748		mg/L		75	36 - 93
2,4,5-Trichlorophenol	1.00	0.766		mg/L		77	49 - 96
2,4,6-Trichlorophenol	1.00	0.773		mg/L		77	48 - 93
2,4-Dinitrotoluene	1.00	0.686		mg/L		69	51 - 90
2-Methylphenol	1.00	0.685		mg/L		69	51 - 100
3 & 4 Methylphenol	1.00	0.580		mg/L		58	46 - 95
Hexachlorobenzene	1.00	0.793		mg/L		79	52 - 93
Hexachlorobutadiene	1.00	0.773		mg/L		77	37 - 92
Hexachloroethane	1.00	0.753		mg/L		75	36 - 95
Nitrobenzene	1.00	0.780		mg/L		78	51 - 93
Pentachlorophenol	1.00	0.573		mg/L		57	41 - 96
Pyridine	1.00	0.571		mg/L		57	10 - 80

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4,6-Tribromophenol (Surr)	73		49 - 100
2-Fluorobiphenyl (Surr)	79		45 - 94
2-Fluorophenol (Surr)	66		46 - 92
Nitrobenzene-d5 (Surr)	79		51 - 98
Phenol-d5 (Surr)	57		37 - 95
Terphenyl-d14 (Surr)	73		60 - 113

Lab Sample ID: MB 160-197376/1-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197376

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
1,2-Dichlorobenzene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
1,3-Dichlorobenzene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
1,4-Dichlorobenzene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
1,4-Dioxane	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
2,4-Dichlorophenol	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
2,4-Dimethylphenol	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
2,4,5-Trichlorophenol	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
2,4-Dinitrophenol	ND		50	2.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
2,4,6-Trichlorophenol	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 160-197376/1-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197376

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-Dinitrotoluene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
2,6-Dinitrotoluene	ND		10	2.2	ug/L		06/25/15 16:18	06/29/15 11:51	1
2-Chloronaphthalene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
2-Chlorophenol	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
2-Methylnaphthalene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
2-Methylphenol	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
2-Nitroaniline	ND		10	1.1	ug/L		06/25/15 16:18	06/29/15 11:51	1
2-Nitrophenol	ND		10	1.5	ug/L		06/25/15 16:18	06/29/15 11:51	1
3 & 4 Methylphenol	ND		20	2.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
3,3'-Dichlorobenzidine	ND		50	1.3	ug/L		06/25/15 16:18	06/29/15 11:51	1
3-Nitroaniline	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
4,6-Dinitro-2-methylphenol	ND		10	1.3	ug/L		06/25/15 16:18	06/29/15 11:51	1
4-Bromophenyl phenyl ether	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
4-Chloro-3-methylphenol	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
4-Chloroaniline	ND		10	2.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
4-Chlorophenyl phenyl ether	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
4-Nitroaniline	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
4-Nitrophenol	ND		10	2.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Acenaphthene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Acenaphthylene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Aniline	ND		10	1.3	ug/L		06/25/15 16:18	06/29/15 11:51	1
Anthracene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Benzo[a]anthracene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Benzo[a]pyrene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Benzo[b]fluoranthene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Benzo[g,h,i]perylene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Benzo[k]fluoranthene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Benzyl alcohol	ND		10	3.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
bis (2-chloroisopropyl) ether	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Bis(2-chloroethoxy)methane	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Bis(2-chloroethyl)ether	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Bis(2-ethylhexyl) phthalate	ND		10	1.9	ug/L		06/25/15 16:18	06/29/15 11:51	1
Butyl benzyl phthalate	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Carbazole	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Chrysene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Dibenz(a,h)anthracene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Dibenzofuran	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Diethyl phthalate	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Dimethyl phthalate	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Di-n-butyl phthalate	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Di-n-octyl phthalate	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Diphenylamine	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Fluoranthene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Fluorene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Hexachlorobenzene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Hexachlorobutadiene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Hexachlorocyclopentadiene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Hexachloroethane	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 160-197376/1-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197376

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Indeno[1,2,3-cd]pyrene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Isophorone	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Naphthalene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Nitrobenzene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
N-Nitrosodi-n-propylamine	ND		10	1.5	ug/L		06/25/15 16:18	06/29/15 11:51	1
Pentachlorophenol	ND		10	1.3	ug/L		06/25/15 16:18	06/29/15 11:51	1
Phenanthrene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Phenol	ND		10	2.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Pyrene	ND		10	1.0	ug/L		06/25/15 16:18	06/29/15 11:51	1
Pyridine	ND		20	2.0	ug/L		06/25/15 16:18	06/29/15 11:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*70*		*47 - 103*	*06/25/15 16:18*	*06/29/15 11:51*	*1*
2-Fluorobiphenyl (Surr)	*78*		*30 - 99*	*06/25/15 16:18*	*06/29/15 11:51*	*1*
2-Fluorophenol (Surr)	*57*		*10 - 74*	*06/25/15 16:18*	*06/29/15 11:51*	*1*
Nitrobenzene-d5 (Surr)	*82*		*31 - 105*	*06/25/15 16:18*	*06/29/15 11:51*	*1*
Phenol-d5 (Surr)	*42*		*10 - 50*	*06/25/15 16:18*	*06/29/15 11:51*	*1*
Terphenyl-d14 (Surr)	*69*		*68 - 116*	*06/25/15 16:18*	*06/29/15 11:51*	*1*

Lab Sample ID: LCS 160-197376/2-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197376

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,4-Trichlorobenzene	200	149		ug/L		74	50 - 90
1,2-Dichlorobenzene	200	150		ug/L		75	49 - 89
1,3-Dichlorobenzene	200	148		ug/L		74	45 - 88
1,4-Dichlorobenzene	200	150		ug/L		75	46 - 88
2,4-Dichlorophenol	200	147		ug/L		73	59 - 81
2,4-Dimethylphenol	200	146		ug/L		73	48 - 96
2,4,5-Trichlorophenol	200	162		ug/L		81	60 - 86
2,4-Dinitrophenol	200	135		ug/L		68	38 - 95
2,4,6-Trichlorophenol	200	160		ug/L		80	61 - 86
2,4-Dinitrotoluene	200	159		ug/L		79	62 - 94
2,6-Dinitrotoluene	200	153		ug/L		77	61 - 94
2-Chloronaphthalene	200	159		ug/L		80	52 - 92
2-Chlorophenol	200	141		ug/L		70	54 - 81
2-Methylnaphthalene	200	146		ug/L		73	53 - 86
2-Methylphenol	200	123		ug/L		62	47 - 75
2-Nitroaniline	200	158		ug/L		79	53 - 98
2-Nitrophenol	200	152		ug/L		76	59 - 88
3 & 4 Methylphenol	200	128		ug/L		64	40 - 79
3,3'-Dichlorobenzidine	200	135		ug/L		67	43 - 80
3-Nitroaniline	200	144		ug/L		72	41 - 84
4,6-Dinitro-2-methylphenol	200	163		ug/L		81	60 - 98
4-Bromophenyl phenyl ether	200	160		ug/L		80	62 - 98
4-Chloro-3-methylphenol	200	138		ug/L		69	56 - 83
4-Chloroaniline	200	131		ug/L		66	31 - 66

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 160-197376/2-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197376

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorophenyl phenyl ether	200	154		ug/L		77	58 - 90
4-Nitroaniline	200	152		ug/L		76	55 - 87
4-Nitrophenol	200	78.7	*	ug/L		39	21 - 36
Acenaphthene	200	156		ug/L		78	55 - 92
Acenaphthylene	200	150		ug/L		75	56 - 93
Anthracene	200	157		ug/L		79	60 - 93
Benzo[a]anthracene	200	160		ug/L		80	72 - 106
Benzo[a]pyrene	200	154		ug/L		77	62 - 94
Benzo[b]fluoranthene	200	167		ug/L		83	67 - 103
Benzo[g,h,i]perylene	200	198		ug/L		99	63 - 117
Benzo[k]fluoranthene	200	152		ug/L		76	66 - 107
bis (2-chloroisopropyl) ether	200	139		ug/L		70	36 - 103
Bis(2-chloroethoxy)methane	200	148		ug/L		74	53 - 92
Bis(2-chloroethyl)ether	200	148		ug/L		74	48 - 94
Bis(2-ethylhexyl) phthalate	200	171		ug/L		85	58 - 107
Butyl benzyl phthalate	200	164		ug/L		82	57 - 104
Carbazole	200	154		ug/L		77	62 - 95
Chrysene	200	163		ug/L		81	64 - 94
Dibenz(a,h)anthracene	200	199		ug/L		100	66 - 110
Dibenzofuran	200	153		ug/L		76	56 - 87
Diethyl phthalate	200	157		ug/L		78	60 - 91
Dimethyl phthalate	200	159		ug/L		79	62 - 91
Di-n-butyl phthalate	200	166		ug/L		83	60 - 97
Di-n-octyl phthalate	200	192		ug/L		96	61 - 103
Diphenylamine	200	140		ug/L		70	69 - 127
Fluoranthene	200	162		ug/L		81	63 - 93
Fluorene	200	161		ug/L		81	60 - 89
Hexachlorobenzene	200	162		ug/L		81	63 - 97
Hexachlorobutadiene	200	155		ug/L		78	45 - 93
Hexachlorocyclopentadiene	200	72.3		ug/L		36	22 - 93
Hexachloroethane	200	154		ug/L		77	41 - 96
Indeno[1,2,3-cd]pyrene	200	200		ug/L		100	64 - 112
Isophorone	200	144		ug/L		72	48 - 87
Naphthalene	200	153		ug/L		76	52 - 88
Nitrobenzene	200	154		ug/L		77	48 - 97
N-Nitrosodi-n-propylamine	200	141		ug/L		70	51 - 102
Pentachlorophenol	200	146		ug/L		73	47 - 96
Phenanthrene	200	160		ug/L		80	60 - 93
Phenol	200	68.8		ug/L		34	21 - 37
Pyrene	200	151		ug/L		76	58 - 102

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*77*		*47 - 103*
2-Fluorobiphenyl (Surr)	*77*		*30 - 99*
2-Fluorophenol (Surr)	*52*		*10 - 74*
Nitrobenzene-d5 (Surr)	*77*		*31 - 105*
Phenol-d5 (Surr)	*37*		*10 - 50*
Terphenyl-d14 (Surr)	*70*		*68 - 116*

Lab Sample ID: LCSD 160-197376/3-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 197376

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	200	156		ug/L		78	50 - 90	5	20
1,2-Dichlorobenzene	200	155		ug/L		78	49 - 89	4	20
1,3-Dichlorobenzene	200	154		ug/L		77	45 - 88	4	20
1,4-Dichlorobenzene	200	154		ug/L		77	46 - 88	3	20
2,4-Dichlorophenol	200	153		ug/L		76	59 - 81	4	20
2,4-Dimethylphenol	200	149		ug/L		75	48 - 96	2	20
2,4,5-Trichlorophenol	200	162		ug/L		81	60 - 86	0	20
2,4-Dinitrophenol	200	127		ug/L		64	38 - 95	6	20
2,4,6-Trichlorophenol	200	162		ug/L		81	61 - 86	2	20
2,4-Dinitrotoluene	200	160		ug/L		80	62 - 94	1	20
2,6-Dinitrotoluene	200	157		ug/L		78	61 - 94	2	20
2-Chloronaphthalene	200	163		ug/L		82	52 - 92	2	20
2-Chlorophenol	200	143		ug/L		71	54 - 81	1	20
2-Methylnaphthalene	200	156		ug/L		78	53 - 86	6	20
2-Methylphenol	200	126		ug/L		63	47 - 75	2	20
2-Nitroaniline	200	158		ug/L		79	53 - 98	0	20
2-Nitrophenol	200	160		ug/L		80	59 - 88	5	20
3 & 4 Methylphenol	200	131		ug/L		66	40 - 79	3	20
3,3'-Dichlorobenzidine	200	143		ug/L		72	43 - 80	6	20
3-Nitroaniline	200	144		ug/L		72	41 - 84	0	20
4,6-Dinitro-2-methylphenol	200	166		ug/L		83	60 - 98	2	20
4-Bromophenyl phenyl ether	200	166		ug/L		83	62 - 98	4	20
4-Chloro-3-methylphenol	200	140		ug/L		70	56 - 83	2	20
4-Chloroaniline	200	137	*	ug/L		68	31 - 66	4	20
4-Chlorophenyl phenyl ether	200	158		ug/L		79	58 - 90	3	20
4-Nitroaniline	200	150		ug/L		75	55 - 87	1	20
4-Nitrophenol	200	79.5	*	ug/L		40	21 - 36	1	20
Acenaphthene	200	160		ug/L		80	55 - 92	3	20
Acenaphthylene	200	158		ug/L		79	56 - 93	5	20
Anthracene	200	162		ug/L		81	60 - 93	3	20
Benzo[a]anthracene	200	163		ug/L		82	72 - 106	2	20
Benzo[a]pyrene	200	159		ug/L		80	62 - 94	3	20
Benzo[b]fluoranthene	200	168		ug/L		84	67 - 103	1	20
Benzo[g,h,i]perylene	200	200		ug/L		100	63 - 117	1	20
Benzo[k]fluoranthene	200	155		ug/L		77	66 - 107	2	20
bis (2-chloroisopropyl) ether	200	140		ug/L		70	36 - 103	0	20
Bis(2-chloroethoxy)methane	200	153		ug/L		77	53 - 92	4	20
Bis(2-chloroethyl)ether	200	151		ug/L		75	48 - 94	2	20
Bis(2-ethylhexyl) phthalate	200	172		ug/L		86	58 - 107	1	20
Butyl benzyl phthalate	200	162		ug/L		81	57 - 104	2	20
Carbazole	200	156		ug/L		78	62 - 95	1	20
Chrysene	200	166		ug/L		83	64 - 94	2	20
Dibenz(a,h)anthracene	200	200		ug/L		100	66 - 110	0	20
Dibenzofuran	200	157		ug/L		79	56 - 87	3	20
Diethyl phthalate	200	157		ug/L		79	60 - 91	0	20
Dimethyl phthalate	200	160		ug/L		80	62 - 91	1	20
Di-n-butyl phthalate	200	166		ug/L		83	60 - 97	0	20
Di-n-octyl phthalate	200	192		ug/L		96	61 - 103	0	20
Diphenylamine	200	145		ug/L		73	69 - 127	4	20
Fluoranthene	200	164		ug/L		82	63 - 93	1	20

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 160-197376/3-A
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 197376

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluorene			200	166		ug/L		83	60 - 89	3	20
Hexachlorobenzene			200	167		ug/L		84	63 - 97	3	20
Hexachlorobutadiene			200	165		ug/L		83	45 - 93	6	20
Hexachlorocyclopentadiene			200	92.8	*	ug/L		46	22 - 93	25	20
Hexachloroethane			200	155		ug/L		78	41 - 96	1	20
Indeno[1,2,3-cd]pyrene			200	208		ug/L		104	64 - 112	4	20
Isophorone			200	147		ug/L		73	48 - 87	2	20
Naphthalene			200	161		ug/L		80	52 - 88	5	20
Nitrobenzene			200	160		ug/L		80	48 - 97	4	20
N-Nitrosodi-n-propylamine			200	143		ug/L		71	51 - 102	1	20
Pentachlorophenol			200	149		ug/L		74	47 - 96	2	20
Phenanthrene			200	165		ug/L		83	60 - 93	3	20
Phenol			200	71.1		ug/L		36	21 - 37	3	20
Pyrene			200	152		ug/L		76	58 - 102	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*79*		*47 - 103*
2-Fluorobiphenyl (Surr)	*80*		*30 - 99*
2-Fluorophenol (Surr)	*54*		*10 - 74*
Nitrobenzene-d5 (Surr)	*80*		*31 - 105*
Phenol-d5 (Surr)	*38*		*10 - 50*
Terphenyl-d14 (Surr)	*71*		*68 - 116*

Lab Sample ID: 160-12349-H-1-N MS
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Matrix Spike
Prep Type: TCLP
Prep Batch: 197372

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dichlorobenzene	ND		1.00	0.737		mg/L		74	46 - 88
2,4,5-Trichlorophenol	ND		1.00	0.708		mg/L		71	52 - 98
2,4,6-Trichlorophenol	ND		1.00	0.790		mg/L		79	52 - 94
2,4-Dinitrotoluene	ND		1.00	0.611		mg/L		61	52 - 97
2-Methylphenol	ND	F2 F1	1.00	0.527	F1	mg/L		53	55 - 97
3 & 4 Methylphenol	0.44	J	1.00	1.17		mg/L		73	46 - 94
Hexachlorobenzene	ND		1.00	0.724		mg/L		72	56 - 90
Hexachlorobutadiene	ND		1.00	0.754		mg/L		75	43 - 92
Hexachloroethane	ND		1.00	0.767		mg/L		77	44 - 91
Nitrobenzene	ND		1.00	0.766		mg/L		77	53 - 97
Pentachlorophenol	ND		1.00	0.600	J	mg/L		60	39 - 103
Pyridine	ND	F1	1.00	ND	F1	mg/L		0	10 - 82

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*70*		*49 - 100*
2-Fluorobiphenyl (Surr)	*75*		*45 - 94*
2-Fluorophenol (Surr)	*52*		*46 - 92*
Nitrobenzene-d5 (Surr)	*107*	*X*	*51 - 98*
Phenol-d5 (Surr)	*13*	*X*	*37 - 95*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 160-12349-H-1-N MS
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Matrix Spike
Prep Type: TCLP
Prep Batch: 197372

Surrogate	MS %Recovery	MS Qualifier	Limits
Terphenyl-d14 (Surr)	*65*		*60 - 113*

Lab Sample ID: 160-12349-H-1-O MSD
Matrix: Water
Analysis Batch: 197753

Client Sample ID: Matrix Spike Duplicate
Prep Type: TCLP
Prep Batch: 197372

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dichlorobenzene	ND		1.00	0.744		mg/L		74	46 - 88	1	20
2,4,5-Trichlorophenol	ND		1.00	0.687		mg/L		69	52 - 98	3	20
2,4,6-Trichlorophenol	ND		1.00	0.716		mg/L		72	52 - 94	10	20
2,4-Dinitrotoluene	ND		1.00	0.613		mg/L		61	52 - 97	0	20
2-Methylphenol	ND	F2 F1	1.00	0.337	F1 F2	mg/L		34	55 - 97	44	20
3 & 4 Methylphenol	0.44	J	1.00	0.970		mg/L		53	46 - 94	18	20
Hexachlorobenzene	ND		1.00	0.750		mg/L		75	56 - 90	4	20
Hexachlorobutadiene	ND		1.00	0.773		mg/L		77	43 - 92	2	20
Hexachloroethane	ND		1.00	0.820		mg/L		82	44 - 91	7	20
Nitrobenzene	ND		1.00	0.806		mg/L		81	53 - 97	5	20
Pentachlorophenol	ND		1.00	0.585	J	mg/L		59	39 - 103	3	20
Pyridine	ND	F1	1.00	ND	F1	mg/L		0	10 - 82	NC	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
2,4,6-Tribromophenol (Surr)	*71*		*49 - 100*
2-Fluorobiphenyl (Surr)	*74*		*45 - 94*
2-Fluorophenol (Surr)	*50*		*46 - 92*
Nitrobenzene-d5 (Surr)	*104*	*X*	*51 - 98*
Phenol-d5 (Surr)	*16*	*X*	*37 - 95*
Terphenyl-d14 (Surr)	*65*		*60 - 113*

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: LCS 160-197348/2-A
Matrix: Water
Analysis Batch: 197511

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197348

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
gamma-BHC (Lindane)			0.00501	0.00557	*	mg/L		111	73 - 102		
Endrin			0.00501	0.00569	*	mg/L		114	77 - 107		
Heptachlor			0.00500	0.00554		mg/L		111	34 - 150		
Heptachlor epoxide			0.00500	0.00568	*	mg/L		114	73 - 99		
Methoxychlor			0.00500	0.00504		mg/L		101	80 - 115		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCB Decachlorobiphenyl (Surr)	*74*		*43 - 131*
Tetrachloro-m-xylene	*98*		*44 - 115*

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LB 160-196535/1-D
Matrix: Water
Analysis Batch: 197511

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 197348

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
gamma-BHC (Lindane)	ND		0.00050	0.000015	mg/L		06/25/15 14:37	06/27/15 02:20	1
Endrin	ND		0.00050	0.000050	mg/L		06/25/15 14:37	06/27/15 02:20	1
Heptachlor	ND		0.00050	0.000015	mg/L		06/25/15 14:37	06/27/15 02:20	1
Heptachlor epoxide	ND		0.00050	0.000050	mg/L		06/25/15 14:37	06/27/15 02:20	1
Methoxychlor	ND		0.0010	0.000050	mg/L		06/25/15 14:37	06/27/15 02:20	1
Toxaphene	ND		0.020	0.000050	mg/L		06/25/15 14:37	06/27/15 02:20	1
Technical Chlordane	ND		0.0050	0.00020	mg/L		06/25/15 14:37	06/27/15 02:20	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*73*		*43 - 131*	*06/25/15 14:37*	*06/27/15 02:20*	*1*
Tetrachloro-m-xylene	*89*		*44 - 115*	*06/25/15 14:37*	*06/27/15 02:20*	*1*

Lab Sample ID: 160-12387-B-1-J MS
Matrix: Water
Analysis Batch: 197511

Client Sample ID: Matrix Spike
Prep Type: TCLP
Prep Batch: 197348

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
gamma-BHC (Lindane)	ND	* F1	0.00501	0.00636	F1	mg/L		127	68 - 109
Endrin	ND	* F1	0.00501	0.00576		mg/L		115	59 - 136
Heptachlor	ND		0.00500	0.00499	p	mg/L		100	34 - 150
Heptachlor epoxide	ND	* F1	0.00500	0.00537		mg/L		107	59 - 117
Methoxychlor	ND	F1 F2	0.00500	0.00465		mg/L		93	70 - 128

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*93*		*43 - 131*
Tetrachloro-m-xylene	*67*	*p*	*44 - 115*

Lab Sample ID: 160-12387-B-1-K MSD
Matrix: Water
Analysis Batch: 197511

Client Sample ID: Matrix Spike Duplicate
Prep Type: TCLP
Prep Batch: 197348

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
gamma-BHC (Lindane)	ND	* F1	0.00501	0.00744	F1	mg/L		149	68 - 109	16	20
Endrin	ND	* F1	0.00501	0.00702	F1	mg/L		140	59 - 136	20	20
Heptachlor	ND		0.00500	0.00579	p	mg/L		116	34 - 150	15	20
Heptachlor epoxide	ND	* F1	0.00500	0.00602	F1	mg/L		120	59 - 117	11	20
Methoxychlor	ND	F1 F2	0.00500	0.00656	F1 F2	mg/L		131	70 - 128	34	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*96*		*43 - 131*
Tetrachloro-m-xylene	*105*		*44 - 115*

Method: 8151A - Herbicides (GC)

Lab Sample ID: LB 160-197374/1-A
Matrix: Water
Analysis Batch: 197744

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197374

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	ND		0.040	0.020	mg/L		06/25/15 16:06	06/29/15 09:46	1
Silvex (2,4,5-TP)	ND		0.010	0.0030	mg/L		06/25/15 16:06	06/29/15 09:46	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*96*		*56 - 147*	*06/25/15 16:06*	*06/29/15 09:46*	*1*

Lab Sample ID: LCS 160-197374/2-A
Matrix: Water
Analysis Batch: 197744

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197374

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
2,4-D			0.200	0.272		mg/L		136	46 - 140		
Silvex (2,4,5-TP)			0.0500	0.0584		mg/L		117	42 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*129*		*56 - 147*

Lab Sample ID: 160-12404-1 MS
Matrix: Water
Analysis Batch: 197744

Client Sample ID: TEST 2 STAGE 2 BLEACH
Prep Type: TCLP
Prep Batch: 197374

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
2,4-D	0.093	F1 F2	0.200	0.199		mg/L		53	52 - 150		
Silvex (2,4,5-TP)	ND	F1 F2	0.0500	0.0781	F1	mg/L		156	45 - 150		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*1035*	*X*	*56 - 147*

Lab Sample ID: 160-12404-1 MSD
Matrix: Water
Analysis Batch: 197744

Client Sample ID: TEST 2 STAGE 2 BLEACH
Prep Type: TCLP
Prep Batch: 197374

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4-D	0.093	F1 F2	0.200	0.154	F1 F2	mg/L		30	52 - 150	26	20
Silvex (2,4,5-TP)	ND	F1 F2	0.0500	0.0583	F2	mg/L		117	45 - 150	29	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*788*	*X*	*56 - 147*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 160-196414/4
Matrix: Water
Analysis Batch: 196414

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	0.050	mg/L			06/19/15 19:03	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 160-196414/4
Matrix: Water
Analysis Batch: 196414

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.20	0.020	mg/L			06/19/15 19:03	1

Lab Sample ID: LCS 160-196414/5
Matrix: Water
Analysis Batch: 196414

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	8.00	7.63		mg/L		95	90 - 110
Chloride	2.00	1.92		mg/L		96	90 - 110

Lab Sample ID: MB 160-196415/4
Matrix: Water
Analysis Batch: 196415

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.020	0.0040	mg/L			06/19/15 19:03	1
Nitrite as N	ND		0.020	0.0030	mg/L			06/19/15 19:03	1

Lab Sample ID: LCS 160-196415/5
Matrix: Water
Analysis Batch: 196415

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.400	0.396		mg/L		99	90 - 110
Nitrite as N	0.160	0.149		mg/L		93	90 - 110

Method: 300.0 - Anions, Ion Chromatography - DL

Lab Sample ID: 160-12404-2 MS
Matrix: Water
Analysis Batch: 196414

Client Sample ID: TEST 2 STAGE 1-H2O WASH
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate - DL	73		80.0	152		mg/L		99	90 - 110
Chloride - DL	19		40.0	59.9		mg/L		102	90 - 110

Lab Sample ID: 160-12404-2 DU
Matrix: Water
Analysis Batch: 196414

Client Sample ID: TEST 2 STAGE 1-H2O WASH
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfate - DL	73		72.9		mg/L		0.4	20
Chloride - DL	19		19.1		mg/L		0	20

Method: 300.0 - Anions, Ion Chromatography - DL (Continued)

Lab Sample ID: 160-12404-2 MS
Matrix: Water
Analysis Batch: 196415

Client Sample ID: TEST 2 STAGE 1-H2O WASH
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N - DL	1.4		8.00	9.98		mg/L		107	90 - 110
Nitrite as N - DL	ND	F1	2.00	1.47	F1	mg/L		73	90 - 110

Lab Sample ID: 160-12404-2 DU
Matrix: Water
Analysis Batch: 196415

Client Sample ID: TEST 2 STAGE 1-H2O WASH
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Nitrate as N - DL	1.4		1.38		mg/L		0.9	20
Nitrite as N - DL	ND	F1	ND		mg/L		NC	20

Method: 6010C - Metals (ICP)

Lab Sample ID: LCS 160-197130/2-A
Matrix: Water
Analysis Batch: 198030

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197130

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	2.50	2.34		mg/L		94	80 - 120
Barium	2.50	2.51		mg/L		100	80 - 120
Cadmium	2.50	2.36		mg/L		94	80 - 120
Chromium	2.50	2.50		mg/L		100	80 - 120
Lead	2.50	2.51		mg/L		100	80 - 120
Selenium	1.25	1.18		mg/L		94	80 - 120
Silver	0.500	0.480		mg/L		96	80 - 120

Lab Sample ID: MB 160-197131/1-A
Matrix: Water
Analysis Batch: 198030

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197131

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	3.7	ug/L		06/24/15 14:36	06/30/15 10:24	1
Arsenic	2.60	J	10	1.8	ug/L		06/24/15 14:36	06/30/15 10:24	1
Barium	ND		50	2.1	ug/L		06/24/15 14:36	06/30/15 10:24	1
Boron	25.4	J	50	7.2	ug/L		06/24/15 14:36	06/30/15 10:24	1
Cadmium	ND		5.0	0.34	ug/L		06/24/15 14:36	06/30/15 10:24	1
Calcium	54.1	J	1000	54	ug/L		06/24/15 14:36	06/30/15 10:24	1
Chromium	ND		10	3.4	ug/L		06/24/15 14:36	06/30/15 10:24	1
Copper	ND		25	2.1	ug/L		06/24/15 14:36	06/30/15 10:24	1
Iron	14.0	J	100	13	ug/L		06/24/15 14:36	06/30/15 10:24	1
Lead	1.00	J	10	0.60	ug/L		06/24/15 14:36	06/30/15 10:24	1
Magnesium	ND		1000	51	ug/L		06/24/15 14:36	06/30/15 10:24	1
Manganese	ND		15	1.0	ug/L		06/24/15 14:36	06/30/15 10:24	1
Molybdenum	ND		40	1.9	ug/L		06/24/15 14:36	06/30/15 10:24	1
Nickel	ND		40	2.6	ug/L		06/24/15 14:36	06/30/15 10:24	1
Potassium	ND		5000	460	ug/L		06/24/15 14:36	06/30/15 10:24	1
Selenium	ND		15	2.1	ug/L		06/24/15 14:36	06/30/15 10:24	1
Silver	ND		10	0.99	ug/L		06/24/15 14:36	06/30/15 10:24	1

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

Lab Sample ID: MB 160-197131/1-A
Matrix: Water
Analysis Batch: 198030

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197131

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	ND		1000	110	ug/L		06/24/15 14:36	06/30/15 10:24	1
Strontium	0.400	J	5.0	0.24	ug/L		06/24/15 14:36	06/30/15 10:24	1
Sulfur	ND		5000	270	ug/L		06/24/15 14:36	06/30/15 10:24	1
Zinc	ND		20	8.3	ug/L		06/24/15 14:36	06/30/15 10:24	1

Lab Sample ID: LCS 160-197131/2-A
Matrix: Water
Analysis Batch: 198030

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197131

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	500	474		ug/L		95	80 - 120
Arsenic	1000	944		ug/L		94	80 - 120
Barium	1000	1030		ug/L		103	80 - 120
Boron	2000	2020		ug/L		101	80 - 120
Cadmium	1000	965		ug/L		96	80 - 120
Calcium	10000	10500		ug/L		105	80 - 120
Chromium	1000	1040		ug/L		104	80 - 120
Copper	1000	1010		ug/L		101	80 - 120
Iron	10000	10400		ug/L		104	80 - 120
Lead	1000	1020		ug/L		102	80 - 120
Magnesium	10000	9610		ug/L		96	80 - 120
Manganese	1000	1020		ug/L		102	80 - 120
Molybdenum	500	502		ug/L		100	80 - 120
Nickel	1000	1030		ug/L		103	80 - 120
Potassium	10000	9790		ug/L		98	80 - 120
Selenium	500	473		ug/L		95	80 - 120
Silver	200	201		ug/L		101	80 - 120
Sodium	10000	9850		ug/L		99	80 - 120
Strontium	1000	1040		ug/L		104	80 - 120
Sulfur	10000	9500		ug/L		95	80 - 120
Zinc	1000	975		ug/L		97	80 - 120

Lab Sample ID: 160-12387-G-1-C MS
Matrix: Water
Analysis Batch: 198030

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 197131

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		1000	946		ug/L		95	75 - 125
Arsenic	57	B	2000	1920		ug/L		93	75 - 125
Barium	37	J	2000	2050		ug/L		101	75 - 125
Boron	65	J B	4000	4100		ug/L		101	75 - 125
Cadmium	ND		2000	1900		ug/L		95	75 - 125
Calcium	30000	B	20000	48100		ug/L		90	75 - 125
Chromium	ND		2000	2030		ug/L		101	75 - 125
Copper	ND		2000	1990		ug/L		100	75 - 125
Iron	120	J B	20000	20700		ug/L		103	75 - 125
Lead	7.4	J B	2000	1990		ug/L		99	75 - 125
Magnesium	6500		20000	25500		ug/L		95	75 - 125
Manganese	3.4	J	2000	2020		ug/L		101	75 - 125

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

Lab Sample ID: 160-12387-G-1-C MS
Matrix: Water
Analysis Batch: 198030

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 197131

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Molybdenum	ND		1000	993		ug/L		99	75 - 125
Nickel	ND		2000	2000		ug/L		100	75 - 125
Potassium	5500	J	20000	24800		ug/L		97	75 - 125
Selenium	ND		1000	955		ug/L		96	75 - 125
Silver	ND		400	394		ug/L		98	75 - 125
Sodium	26000		20000	44700		ug/L		93	75 - 125
Strontium	160	B	2000	2210		ug/L		102	75 - 125
Sulfur	34000		20000	51500		ug/L		86	75 - 125
Zinc	570		2000	2290		ug/L		86	75 - 125

Lab Sample ID: 160-12387-G-1-D MSD
Matrix: Water
Analysis Batch: 198030

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 197131

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		1000	938		ug/L		94	75 - 125	1	20
Arsenic	57	B	2000	1910		ug/L		93	75 - 125	0	20
Barium	37	J	2000	2040		ug/L		100	75 - 125	1	20
Boron	65	J B	4000	4070		ug/L		100	75 - 125	1	20
Cadmium	ND		2000	1890		ug/L		95	75 - 125	0	20
Calcium	30000	B	20000	48300		ug/L		91	75 - 125	0	20
Chromium	ND		2000	2030		ug/L		101	75 - 125	0	20
Copper	ND		2000	1990		ug/L		99	75 - 125	0	20
Iron	120	J B	20000	20700		ug/L		103	75 - 125	0	20
Lead	7.4	J B	2000	1980		ug/L		99	75 - 125	0	20
Magnesium	6500		20000	25500		ug/L		95	75 - 125	0	20
Manganese	3.4	J	2000	2010		ug/L		100	75 - 125	0	20
Molybdenum	ND		1000	985		ug/L		99	75 - 125	1	20
Nickel	ND		2000	2000		ug/L		100	75 - 125	0	20
Potassium	5500	J	20000	24400		ug/L		95	75 - 125	2	20
Selenium	ND		1000	958		ug/L		96	75 - 125	0	20
Silver	ND		400	394		ug/L		99	75 - 125	0	20
Sodium	26000		20000	44100		ug/L		90	75 - 125	1	20
Strontium	160	B	2000	2190		ug/L		101	75 - 125	1	20
Sulfur	34000		20000	51800		ug/L		87	75 - 125	1	20
Zinc	570		2000	2280		ug/L		86	75 - 125	0	20

Lab Sample ID: LB 160-196535/1-C
Matrix: Water
Analysis Batch: 198030

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 197130

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	0.0045	mg/L		06/24/15 14:33	06/30/15 10:55	1
Barium	ND		0.13	0.0053	mg/L		06/24/15 14:33	06/30/15 10:55	1
Cadmium	ND		0.013	0.00084	mg/L		06/24/15 14:33	06/30/15 10:55	1
Chromium	ND		0.025	0.0084	mg/L		06/24/15 14:33	06/30/15 10:55	1
Lead	ND		0.25	0.0015	mg/L		06/24/15 14:33	06/30/15 10:55	1
Selenium	ND		0.50	0.0052	mg/L		06/24/15 14:33	06/30/15 10:55	1
Silver	ND		0.025	0.0025	mg/L		06/24/15 14:33	06/30/15 10:55	1

Lab Sample ID: 160-12387-B-1-G MS
Matrix: Water
Analysis Batch: 198030

Client Sample ID: Matrix Spike
Prep Type: TCLP
Prep Batch: 197130

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.051	J	2.50	2.40		mg/L		94	75 - 125
Barium	0.036	J	2.50	2.50		mg/L		99	75 - 125
Cadmium	ND		2.50	2.39		mg/L		95	75 - 125
Chromium	ND		2.50	2.50		mg/L		100	75 - 125
Lead	0.0055	J	2.50	2.53		mg/L		101	75 - 125
Selenium	ND		1.25	1.20		mg/L		96	75 - 125
Silver	ND		0.500	0.494		mg/L		99	75 - 125

Lab Sample ID: 160-12387-B-1-H MSD
Matrix: Water
Analysis Batch: 198030

Client Sample ID: Matrix Spike Duplicate
Prep Type: TCLP
Prep Batch: 197130

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.051	J	2.50	2.42		mg/L		95	75 - 125	1	20
Barium	0.036	J	2.50	2.51		mg/L		99	75 - 125	0	20
Cadmium	ND		2.50	2.39		mg/L		96	75 - 125	0	20
Chromium	ND		2.50	2.49		mg/L		100	75 - 125	0	20
Lead	0.0055	J	2.50	2.54		mg/L		101	75 - 125	0	20
Selenium	ND		1.25	1.21		mg/L		97	75 - 125	1	20
Silver	ND		0.500	0.474		mg/L		95	75 - 125	4	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LCS 160-196842/2-A
Matrix: Water
Analysis Batch: 197063

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196842

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.0250	0.0248		mg/L		99	80 - 120

Lab Sample ID: MB 160-196843/1-A
Matrix: Water
Analysis Batch: 197063

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 196843

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.060	ug/L		06/23/15 08:40	06/23/15 14:15	1

Lab Sample ID: LCS 160-196843/2-A
Matrix: Water
Analysis Batch: 197063

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 196843

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.89		ug/L		98	80 - 120

Lab Sample ID: 160-12415-B-7-C MS
Matrix: Water
Analysis Batch: 197063

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 196843

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		5.00	5.06		ug/L		101	80 - 120

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 160-12415-B-7-D MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 197063 — **Prep Batch: 196843**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		5.00	4.91		ug/L		98	80 - 120	3	20

Lab Sample ID: LB 160-196535/1-B — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: TCLP**
Analysis Batch: 197063 — **Prep Batch: 196842**

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000194	J	0.0010	0.000079	mg/L		06/23/15 08:38	06/23/15 14:00	1

Lab Sample ID: 160-12387-B-1-D MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: TCLP**
Analysis Batch: 197063 — **Prep Batch: 196842**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.0030	B	0.0250	0.0268		mg/L		95	70 - 130

Lab Sample ID: 160-12387-B-1-E MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: TCLP**
Analysis Batch: 197063 — **Prep Batch: 196842**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.0030	B	0.0250	0.0237		mg/L		83	70 - 130	12	20

Method: 1664A - HEM and SGT-HEM

Lab Sample ID: MB 490-260414/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 260421 — **Prep Batch: 260414**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fats, Oils or Grease	ND		4.0	1.4	mg/L		06/29/15 10:17	06/29/15 10:17	1

Lab Sample ID: LCS 490-260414/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 260421 — **Prep Batch: 260414**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fats, Oils or Grease	41.7	39.1		mg/L		94	78 - 114

Lab Sample ID: 490-80857-B-1-A MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 260421 — **Prep Batch: 260414**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fats, Oils or Grease	3.3	J	47.6	42.9		mg/L		83	78 - 114

Method: 1664A - HEM and SGT-HEM (Continued)

Lab Sample ID: MB 490-260778/1-A
Matrix: Water
Analysis Batch: 260780

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 260778

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fats, Oils or Grease	ND		4.0	1.4	mg/L		06/30/15 10:28	06/30/15 10:28	1

Lab Sample ID: LCS 490-260778/2-A
Matrix: Water
Analysis Batch: 260780

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 260778

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fats, Oils or Grease	41.7	40.0		mg/L		96	78 - 114

Lab Sample ID: 490-81006-G-2-A MS
Matrix: Water
Analysis Batch: 260780

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 260778

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fats, Oils or Grease	ND		53.3	46.9		mg/L		88	78 - 114

Method: 335.4 - Cyanide, Total

Lab Sample ID: MB 490-258801/1-A
Matrix: Water
Analysis Batch: 258952

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 258801

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		0.010	0.0070	mg/L		06/23/15 17:52	06/24/15 10:10	1

Lab Sample ID: LCS 490-258801/2-A
Matrix: Water
Analysis Batch: 258952

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 258801

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.100	0.0899		mg/L		90	90 - 110

Lab Sample ID: 590-1080-A-3-B MS
Matrix: Water
Analysis Batch: 258952

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 258801

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.0076	J F1	0.100	ND	F1	mg/L		0	90 - 110

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 490-259920/1-A
Matrix: Water
Analysis Batch: 260047

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 259920

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.10	0.060	mg/L		06/26/15 17:15	06/27/15 07:35	1

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: LCS 490-259920/2-A
Matrix: Water
Analysis Batch: 260047

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 259920

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	5.00	5.21		mg/L		104	90 - 110

Lab Sample ID: 490-80936-A-2-B MS
Matrix: Water
Analysis Batch: 260047

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 259920

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	0.15	F1	5.00	ND	F1	mg/L		0	90 - 110

Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 490-259879/1-A
Matrix: Water
Analysis Batch: 260493

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 259879

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Kjeldahl Nitrogen as N	0.112	J	0.25	0.060	mg/L		06/26/15 15:31	06/28/15 08:54	1

Lab Sample ID: LCS 490-259879/2-A
Matrix: Water
Analysis Batch: 260493

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 259879

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	2.50	2.45		mg/L		98	90 - 110

Lab Sample ID: 490-80936-A-4-B MS
Matrix: Water
Analysis Batch: 260493

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 259879

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	0.70	B	2.50	2.94		mg/L		90	90 - 110

Lab Sample ID: 490-80936-A-4-C MSD
Matrix: Water
Analysis Batch: 260493

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 259879

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Kjeldahl Nitrogen as N	0.70	B	2.50	3.04		mg/L		94	90 - 110	3	20

Method: 365.4 - Phosphorus, Total

Lab Sample ID: MB 490-260993/1-A
Matrix: Water
Analysis Batch: 261310

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 260993

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.10	0.050	mg/L		06/30/15 02:37	07/01/15 12:02	1

Method: 365.4 - Phosphorus, Total (Continued)

Lab Sample ID: LCS 490-260993/2-A
Matrix: Water
Analysis Batch: 261310

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 260993

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	2.00	1.95		mg/L		98	90 - 110

Lab Sample ID: 580-50989-E-1-C MS
Matrix: Water
Analysis Batch: 261310

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 260993

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	0.47		2.00	2.15		mg/L		84	73 - 119

Lab Sample ID: 580-50989-E-1-D MSD
Matrix: Water
Analysis Batch: 261310

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 260993

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phosphorus, Total	0.47		2.00	2.23		mg/L		88	73 - 119	4	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-258384/5
Matrix: Water
Analysis Batch: 258384

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	ND		10	5.0	mg/L			06/22/15 12:32	1
Alkalinity	ND		10	5.0	mg/L			06/22/15 12:32	1

Lab Sample ID: LCS 490-258384/6
Matrix: Water
Analysis Batch: 258384

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	90.2		mg/L		90	90 - 110

Lab Sample ID: LCSD 490-258384/7
Matrix: Water
Analysis Batch: 258384

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity	100	91.0		mg/L		91	90 - 110	1	20

Lab Sample ID: 160-12404-1 DU
Matrix: Water
Analysis Batch: 258384

Client Sample ID: TEST 2 STAGE 2 BLEACH
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Bicarbonate Alkalinity as CaCO3	ND		ND		mg/L		NC	20
Alkalinity	ND		ND		mg/L		NC	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 490-254941/1
Matrix: Water
Analysis Batch: 254941

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	7.0	mg/L			06/23/15 11:00	1

Lab Sample ID: LCS 490-254941/2
Matrix: Water
Analysis Batch: 254941

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			99.9	92.0		mg/L		92	90 - 110		

Lab Sample ID: LCSD 490-254941/3
Matrix: Water
Analysis Batch: 254941

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			99.9	95.0		mg/L		95	90 - 110	3	20

Lab Sample ID: 490-80902-O-7 DU
Matrix: Water
Analysis Batch: 254941

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	90			87.0		mg/L				3	20

Lab Sample ID: 490-80987-H-7 DU
Matrix: Water
Analysis Batch: 254941

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	12000			12100		mg/L				3	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 490-258648/1
Matrix: Water
Analysis Batch: 258648

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.0	0.70	mg/L			06/23/15 13:30	1

Lab Sample ID: LCS 490-258648/2
Matrix: Water
Analysis Batch: 258648

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Suspended Solids			100	102		mg/L		102	90 - 110		

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: 490-80910-D-6 DU
Matrix: Water
Analysis Batch: 258648

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	0.70	J		ND		mg/L				NC	20

Lab Sample ID: 490-81025-L-1 DU
Matrix: Water
Analysis Batch: 258648

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	6.2			1.70	F3	mg/L				114	20

Method: SM 4500 Cl G - Chlorine, Residual

Lab Sample ID: MB 490-260593/1
Matrix: Water
Analysis Batch: 260593

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorine, Total Residual	ND		0.10	0.040	mg/L			06/29/15 15:48	1

Lab Sample ID: LCS 490-260593/2
Matrix: Water
Analysis Batch: 260593

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chlorine, Total Residual			0.200	0.196		mg/L		98	85 - 115		

Lab Sample ID: 160-12349-O-1 DU
Matrix: Water
Analysis Batch: 260593

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chlorine, Total Residual	0.42			0.458		mg/L				10	20

Method: SM 4500 H+ B - pH

Lab Sample ID: 490-81012-B-1 DU
Matrix: Water
Analysis Batch: 258354

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.82			7.820		SU				0	20

Method: SM 4500 S2 F - Sulfide, Total

Lab Sample ID: MB 490-259189/2
Matrix: Water
Analysis Batch: 259189

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide, Dissolved	ND		1.0	0.50	mg/L			06/24/15 20:00	1
Total Sulfide	ND		1.0	0.50	mg/L			06/24/15 20:00	1

Lab Sample ID: LCS 490-259189/3
Matrix: Water
Analysis Batch: 259189

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfide, Dissolved			20.0	19.9		mg/L		99	90 - 110		
Total Sulfide			20.0	19.9		mg/L		99	90 - 110		

Lab Sample ID: 160-12404-2 MS
Matrix: Water
Analysis Batch: 259189

Client Sample ID: TEST 2 STAGE 1-H2O WASH
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfide, Dissolved	5.0		20.0	21.2		mg/L		80	70 - 130		
Sulfide, Dissolved	5.0		20.0	21.2		mg/L		80	70 - 130		
Total Sulfide	5.0		20.0	21.2		mg/L		80	70 - 130		
Total Sulfide	5.0		20.0	21.2		mg/L		80	70 - 130		

Lab Sample ID: 160-12404-2 MSD
Matrix: Water
Analysis Batch: 259189

Client Sample ID: TEST 2 STAGE 1-H2O WASH
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfide, Dissolved	5.0		20.0	21.6		mg/L		82	70 - 130	1	10
Sulfide, Dissolved	5.0		20.0	21.6		mg/L		82	70 - 130	1	10
Total Sulfide	5.0		20.0	21.6		mg/L		82	70 - 130	1	10
Total Sulfide	5.0		20.0	21.6		mg/L		82	70 - 130	1	10

Lab Sample ID: 490-80900-F-4 DU
Matrix: Water
Analysis Batch: 259189

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Sulfide, Dissolved	ND			ND		mg/L				NC	20
Total Sulfide	ND			ND		mg/L				NC	20

Method: SM 4500 SO3 B - Sulfite

Lab Sample ID: MB 490-261075/1
Matrix: Water
Analysis Batch: 261075

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfite	ND		5.0	2.5	mg/L			07/01/15 09:54	1

Method: SM 4500 SO3 B - Sulfite (Continued)

Lab Sample ID: LCS 490-261075/2
Matrix: Water
Analysis Batch: 261075

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfite			19.9	19.6		mg/L		98	90 - 110		

Lab Sample ID: 160-12404-1 MS
Matrix: Water
Analysis Batch: 261075

Client Sample ID: TEST 2 STAGE 2 BLEACH
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfite	28	HF	19.9	46.8		mg/L		96	80 - 120		

Lab Sample ID: 160-12404-1 MSD
Matrix: Water
Analysis Batch: 261075

Client Sample ID: TEST 2 STAGE 2 BLEACH
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfite	28	HF	19.9	47.2		mg/L		98	80 - 120	1	20

Lab Sample ID: 160-12404-2 DU
Matrix: Water
Analysis Batch: 261075

Client Sample ID: TEST 2 STAGE 1-H2O WASH
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Sulfite	10	HF		10.0		mg/L				0	20

Method: SM 5220D - COD

Lab Sample ID: MB 490-260432/14
Matrix: Water
Analysis Batch: 260432

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		20	4.0	mg/L			06/29/15 08:59	1

Lab Sample ID: LCS 490-260432/15
Matrix: Water
Analysis Batch: 260432

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chemical Oxygen Demand			50.0	50.5		mg/L		101	95 - 105		

Lab Sample ID: 490-81308-B-1 DU
Matrix: Water
Analysis Batch: 260432

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chemical Oxygen Demand	24	F1		24.6		mg/L				0.7	20

Method: SM 5220D - COD (Continued)

Lab Sample ID: MB 490-261280/4
Matrix: Water
Analysis Batch: 261280

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		20	4.0	mg/L			07/01/15 15:10	1

Lab Sample ID: LCS 490-261280/5
Matrix: Water
Analysis Batch: 261280

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chemical Oxygen Demand	50.0	51.9		mg/L		104	95 - 105

Lab Sample ID: 490-81626-F-2 MS
Matrix: Water
Analysis Batch: 261280

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chemical Oxygen Demand	15	J F1	50.0	66.6		mg/L		104	95 - 105

Lab Sample ID: 490-81626-F-2 MSD
Matrix: Water
Analysis Batch: 261280

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chemical Oxygen Demand	15	J F1	50.0	59.4	F1	mg/L		89	95 - 105	11	20

Lab Sample ID: 490-81626-F-1 DU
Matrix: Water
Analysis Batch: 261280

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chemical Oxygen Demand	98		95.9		mg/L		2	20

Method: SM5210B - BOD, 5 Day

Lab Sample ID: MB 490-259252/4
Matrix: Water
Analysis Batch: 259252

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Biochemical Oxygen Demand	ND		2.0	2.0	mg/L			06/20/15 12:30	1

Lab Sample ID: LCS 490-259252/2
Matrix: Water
Analysis Batch: 259252

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Biochemical Oxygen Demand	3.96	4.29		mg/L		108	85 - 115

Method: SM5210B - BOD, 5 Day (Continued)

Lab Sample ID: LCSD 490-259252/3
Matrix: Water
Analysis Batch: 259252

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Biochemical Oxygen Demand			3.96	3.72		mg/L		94	85 - 115	14	20

Lab Sample ID: 490-80984-B-1 DU
Matrix: Water
Analysis Batch: 259252

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Biochemical Oxygen Demand	ND			ND		mg/L				NC	20

GC/MS VOA

Leach Batch: 196524

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	1311	
160-12404-1 - DL	TEST 2 STAGE 2 BLEACH	TCLP	Water	1311	
160-12404-1 MS	TEST 2 STAGE 2 BLEACH	TCLP	Water	1311	
160-12404-1 MSD	TEST 2 STAGE 2 BLEACH	TCLP	Water	1311	
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	1311	
160-12404-2 - DL	TEST 2 STAGE 1-H2O WASH	TCLP	Water	1311	
LB 160-196524/1-A	Method Blank	TCLP	Water	1311	

Analysis Batch: 196598

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	8260C	196524
160-12404-1 MS	TEST 2 STAGE 2 BLEACH	TCLP	Water	8260C	196524
160-12404-1 MSD	TEST 2 STAGE 2 BLEACH	TCLP	Water	8260C	196524
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	8260C	196524
160-12404-2 - DL	TEST 2 STAGE 1-H2O WASH	TCLP	Water	8260C	196524
LB 160-196524/1-A	Method Blank	TCLP	Water	8260C	196524

Analysis Batch: 197153

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1 - DL	TEST 2 STAGE 2 BLEACH	TCLP	Water	8260C	196524
160-12404-1 - DL	TEST 2 STAGE 2 BLEACH	Total/NA	Water	8260C	
160-12404-1 - DL2	TEST 2 STAGE 2 BLEACH	Total/NA	Water	8260C	
160-12404-2 - DL	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	8260C	
160-12404-2 - DL2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	8260C	
LCS 160-197153/10	Lab Control Sample	Total/NA	Water	8260C	
LCSD 160-197153/11	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 160-197153/13	Method Blank	Total/NA	Water	8260C	

Analysis Batch: 197849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 160-197849/4 - RA	Lab Control Sample	Total/NA	Water	8260C	

GC/MS Semi VOA

Leach Batch: 196046

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-H-1-N MS	Matrix Spike	TCLP	Water	1311	
160-12349-H-1-O MSD	Matrix Spike Duplicate	TCLP	Water	1311	

Leach Batch: 196535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	1311	
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	1311	

Prep Batch: 197372

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-H-1-N MS	Matrix Spike	TCLP	Water	3510C	196046
160-12349-H-1-O MSD	Matrix Spike Duplicate	TCLP	Water	3510C	196046
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	3510C	196535
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	3510C	196535

GC/MS Semi VOA (Continued)

Prep Batch: 197372 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 160-197372/1-A	Method Blank	Total/NA	Water	3510C	
LCS 160-197372/2-A	Lab Control Sample	Total/NA	Water	3510C	

Prep Batch: 197376

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	3510C	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	3510C	
LCS 160-197376/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 160-197376/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 160-197376/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 197753

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-H-1-N MS	Matrix Spike	TCLP	Water	8270D	197372
160-12349-H-1-O MSD	Matrix Spike Duplicate	TCLP	Water	8270D	197372
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	8270D	197372
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	8270D	197376
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	8270D	197372
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	8270D	197376
LB 160-197372/1-A	Method Blank	Total/NA	Water	8270D	197372
LCS 160-197372/2-A	Lab Control Sample	Total/NA	Water	8270D	197372
LCS 160-197376/2-A	Lab Control Sample	Total/NA	Water	8270D	197376
LCSD 160-197376/3-A	Lab Control Sample Dup	Total/NA	Water	8270D	197376
MB 160-197376/1-A	Method Blank	Total/NA	Water	8270D	197376

GC Semi VOA

Leach Batch: 196535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12387-B-1-J MS	Matrix Spike	TCLP	Water	1311	
160-12387-B-1-K MSD	Matrix Spike Duplicate	TCLP	Water	1311	
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	1311	
160-12404-1 MS	TEST 2 STAGE 2 BLEACH	TCLP	Water	1311	
160-12404-1 MSD	TEST 2 STAGE 2 BLEACH	TCLP	Water	1311	
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	1311	
160-12404-2 - RA	TEST 2 STAGE 1-H2O WASH	TCLP	Water	1311	
LB 160-196535/1-D	Method Blank	TCLP	Water	1311	

Prep Batch: 197348

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12387-B-1-J MS	Matrix Spike	TCLP	Water	3510C	196535
160-12387-B-1-K MSD	Matrix Spike Duplicate	TCLP	Water	3510C	196535
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	3510C	196535
160-12404-2 - RA	TEST 2 STAGE 1-H2O WASH	TCLP	Water	3510C	196535
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	3510C	196535
LB 160-196535/1-D	Method Blank	TCLP	Water	3510C	196535
LCS 160-197348/2-A	Lab Control Sample	Total/NA	Water	3510C	

GC Semi VOA (Continued)

Prep Batch: 197374

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	8151A	196535
160-12404-1 MS	TEST 2 STAGE 2 BLEACH	TCLP	Water	8151A	196535
160-12404-1 MSD	TEST 2 STAGE 2 BLEACH	TCLP	Water	8151A	196535
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	8151A	196535
LB 160-197374/1-A	Method Blank	Total/NA	Water	8151A	
LCS 160-197374/2-A	Lab Control Sample	Total/NA	Water	8151A	

Analysis Batch: 197511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12387-B-1-J MS	Matrix Spike	TCLP	Water	8081B	197348
160-12387-B-1-K MSD	Matrix Spike Duplicate	TCLP	Water	8081B	197348
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	8081B	197348
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	8081B	197348
LB 160-196535/1-D	Method Blank	TCLP	Water	8081B	197348
LCS 160-197348/2-A	Lab Control Sample	Total/NA	Water	8081B	197348

Analysis Batch: 197744

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	8151A	197374
160-12404-1 MS	TEST 2 STAGE 2 BLEACH	TCLP	Water	8151A	197374
160-12404-1 MSD	TEST 2 STAGE 2 BLEACH	TCLP	Water	8151A	197374
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	8151A	197374
LB 160-197374/1-A	Method Blank	Total/NA	Water	8151A	197374
LCS 160-197374/2-A	Lab Control Sample	Total/NA	Water	8151A	197374

Analysis Batch: 198223

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-2 - RA	TEST 2 STAGE 1-H2O WASH	TCLP	Water	8081B	197348

HPLC/IC

Analysis Batch: 196414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1 - DL	TEST 2 STAGE 2 BLEACH	Total/NA	Water	300.0	
160-12404-1 - DL4	TEST 2 STAGE 2 BLEACH	Total/NA	Water	300.0	
160-12404-2 - DL	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	300.0	
160-12404-2 DU - DL	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	300.0	
160-12404-2 MS - DL	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	300.0	
LCS 160-196414/5	Lab Control Sample	Total/NA	Water	300.0	
MB 160-196414/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 196415

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1 - DL2	TEST 2 STAGE 2 BLEACH	Total/NA	Water	300.0	
160-12404-1 - DL3	TEST 2 STAGE 2 BLEACH	Total/NA	Water	300.0	
160-12404-2 - DL	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	300.0	
160-12404-2 DU - DL	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	300.0	
160-12404-2 MS - DL	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	300.0	
LCS 160-196415/5	Lab Control Sample	Total/NA	Water	300.0	
MB 160-196415/4	Method Blank	Total/NA	Water	300.0	

Metals

Leach Batch: 196535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12387-B-1-D MS	Matrix Spike	TCLP	Water	1311	
160-12387-B-1-E MSD	Matrix Spike Duplicate	TCLP	Water	1311	
160-12387-B-1-G MS	Matrix Spike	TCLP	Water	1311	
160-12387-B-1-H MSD	Matrix Spike Duplicate	TCLP	Water	1311	
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	1311	
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	1311	
LB 160-196535/1-B	Method Blank	TCLP	Water	1311	
LB 160-196535/1-C	Method Blank	TCLP	Water	1311	

Prep Batch: 196842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12387-B-1-D MS	Matrix Spike	TCLP	Water	7470A	196535
160-12387-B-1-E MSD	Matrix Spike Duplicate	TCLP	Water	7470A	196535
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	7470A	196535
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	7470A	196535
LB 160-196535/1-B	Method Blank	TCLP	Water	7470A	196535
LCS 160-196842/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 196843

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	7470A	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	7470A	
160-12415-B-7-C MS	Matrix Spike	Total/NA	Water	7470A	
160-12415-B-7-D MSD	Matrix Spike Duplicate	Total/NA	Water	7470A	
LCS 160-196843/2-A	Lab Control Sample	Total/NA	Water	7470A	
MB 160-196843/1-A	Method Blank	Total/NA	Water	7470A	

Analysis Batch: 197063

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12387-B-1-D MS	Matrix Spike	TCLP	Water	7470A	196842
160-12387-B-1-E MSD	Matrix Spike Duplicate	TCLP	Water	7470A	196842
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	7470A	196842
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	7470A	196843
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	7470A	196842
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	7470A	196843
160-12415-B-7-C MS	Matrix Spike	Total/NA	Water	7470A	196843
160-12415-B-7-D MSD	Matrix Spike Duplicate	Total/NA	Water	7470A	196843
LB 160-196535/1-B	Method Blank	TCLP	Water	7470A	196842
LCS 160-196842/2-A	Lab Control Sample	Total/NA	Water	7470A	196842
LCS 160-196843/2-A	Lab Control Sample	Total/NA	Water	7470A	196843
MB 160-196843/1-A	Method Blank	Total/NA	Water	7470A	196843

Prep Batch: 197130

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12387-B-1-G MS	Matrix Spike	TCLP	Water	3010A	196535
160-12387-B-1-H MSD	Matrix Spike Duplicate	TCLP	Water	3010A	196535
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	3010A	196535
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	3010A	196535
LB 160-196535/1-C	Method Blank	TCLP	Water	3010A	196535
LCS 160-197130/2-A	Lab Control Sample	Total/NA	Water	3010A	

Metals (Continued)

Prep Batch: 197131

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12387-G-1-C MS	Matrix Spike	Total/NA	Water	3010A	
160-12387-G-1-D MSD	Matrix Spike Duplicate	Total/NA	Water	3010A	
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	3010A	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	3010A	
LCS 160-197131/2-A	Lab Control Sample	Total/NA	Water	3010A	
MB 160-197131/1-A	Method Blank	Total/NA	Water	3010A	

Analysis Batch: 198030

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12387-B-1-G MS	Matrix Spike	TCLP	Water	6010C	197130
160-12387-B-1-H MSD	Matrix Spike Duplicate	TCLP	Water	6010C	197130
160-12387-G-1-C MS	Matrix Spike	Total/NA	Water	6010C	197131
160-12387-G-1-D MSD	Matrix Spike Duplicate	Total/NA	Water	6010C	197131
160-12404-1	TEST 2 STAGE 2 BLEACH	TCLP	Water	6010C	197130
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	6010C	197131
160-12404-2	TEST 2 STAGE 1-H2O WASH	TCLP	Water	6010C	197130
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	6010C	197131
LB 160-196535/1-C	Method Blank	TCLP	Water	6010C	197130
LCS 160-197130/2-A	Lab Control Sample	Total/NA	Water	6010C	197130
LCS 160-197131/2-A	Lab Control Sample	Total/NA	Water	6010C	197131
MB 160-197131/1-A	Method Blank	Total/NA	Water	6010C	197131

General Chemistry

Analysis Batch: 254941

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	SM 2540C	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	SM 2540C	
490-80902-O-7 DU	Duplicate	Total/NA	Water	SM 2540C	
490-80987-H-7 DU	Duplicate	Total/NA	Water	SM 2540C	
LCS 490-254941/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 490-254941/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
MB 490-254941/1	Method Blank	Total/NA	Water	SM 2540C	

Analysis Batch: 258354

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	SM 4500 H+ B	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	SM 4500 H+ B	
490-81012-B-1 DU	Duplicate	Total/NA	Water	SM 4500 H+ B	
LCS 490-258354/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 258384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	SM 2320B	
160-12404-1 DU	TEST 2 STAGE 2 BLEACH	Total/NA	Water	SM 2320B	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	SM 2320B	
LCS 490-258384/6	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 490-258384/7	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
MB 490-258384/5	Method Blank	Total/NA	Water	SM 2320B	

General Chemistry (Continued)

Analysis Batch: 258648

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	SM 2540D	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	SM 2540D	
490-80910-D-6 DU	Duplicate	Total/NA	Water	SM 2540D	
490-81025-L-1 DU	Duplicate	Total/NA	Water	SM 2540D	
LCS 490-258648/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 490-258648/1	Method Blank	Total/NA	Water	SM 2540D	

Prep Batch: 258801

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	Distill/CN	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	Distill/CN	
590-1080-A-3-B MS	Matrix Spike	Total/NA	Water	Distill/CN	
LCS 490-258801/2-A	Lab Control Sample	Total/NA	Water	Distill/CN	
MB 490-258801/1-A	Method Blank	Total/NA	Water	Distill/CN	

Analysis Batch: 258952

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	335.4	258801
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	335.4	258801
590-1080-A-3-B MS	Matrix Spike	Total/NA	Water	335.4	258801
LCS 490-258801/2-A	Lab Control Sample	Total/NA	Water	335.4	258801
MB 490-258801/1-A	Method Blank	Total/NA	Water	335.4	258801

Analysis Batch: 259189

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	SM 4500 S2 F	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	SM 4500 S2 F	
160-12404-2 MS	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	SM 4500 S2 F	
160-12404-2 MSD	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	SM 4500 S2 F	
490-80900-F-4 DU	Duplicate	Total/NA	Water	SM 4500 S2 F	
LCS 490-259189/3	Lab Control Sample	Total/NA	Water	SM 4500 S2 F	
MB 490-259189/2	Method Blank	Total/NA	Water	SM 4500 S2 F	

Analysis Batch: 259252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	SM5210B	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	SM5210B	
490-80984-B-1 DU	Duplicate	Total/NA	Water	SM5210B	
LCS 490-259252/2	Lab Control Sample	Total/NA	Water	SM5210B	
LCSD 490-259252/3	Lab Control Sample Dup	Total/NA	Water	SM5210B	
MB 490-259252/4	Method Blank	Total/NA	Water	SM5210B	

Prep Batch: 259879

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	351.2	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	351.2	
490-80936-A-4-B MS	Matrix Spike	Total/NA	Water	351.2	
490-80936-A-4-C MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	
LCS 490-259879/2-A	Lab Control Sample	Total/NA	Water	351.2	
MB 490-259879/1-A	Method Blank	Total/NA	Water	351.2	

General Chemistry (Continued)

Prep Batch: 259920

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	Distill/Ammonia	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	Distill/Ammonia	
490-80936-A-2-B MS	Matrix Spike	Total/NA	Water	Distill/Ammonia	
LCS 490-259920/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 490-259920/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 260047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	350.1	259920
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	350.1	259920
490-80936-A-2-B MS	Matrix Spike	Total/NA	Water	350.1	259920
LCS 490-259920/2-A	Lab Control Sample	Total/NA	Water	350.1	259920
MB 490-259920/1-A	Method Blank	Total/NA	Water	350.1	259920

Prep Batch: 260414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	1664A	
490-80857-B-1-A MS	Matrix Spike	Total/NA	Water	1664A	
LCS 490-260414/2-A	Lab Control Sample	Total/NA	Water	1664A	
MB 490-260414/1-A	Method Blank	Total/NA	Water	1664A	

Analysis Batch: 260421

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	1664A	260414
490-80857-B-1-A MS	Matrix Spike	Total/NA	Water	1664A	260414
LCS 490-260414/2-A	Lab Control Sample	Total/NA	Water	1664A	260414
MB 490-260414/1-A	Method Blank	Total/NA	Water	1664A	260414

Analysis Batch: 260432

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	SM 5220D	
490-81308-B-1 DU	Duplicate	Total/NA	Water	SM 5220D	
LCS 490-260432/15	Lab Control Sample	Total/NA	Water	SM 5220D	
MB 490-260432/14	Method Blank	Total/NA	Water	SM 5220D	

Analysis Batch: 260493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	351.2	259879
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	351.2	259879
490-80936-A-4-B MS	Matrix Spike	Total/NA	Water	351.2	259879
490-80936-A-4-C MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	259879
LCS 490-259879/2-A	Lab Control Sample	Total/NA	Water	351.2	259879
MB 490-259879/1-A	Method Blank	Total/NA	Water	351.2	259879

Analysis Batch: 260593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12349-O-1 DU	Duplicate	Total/NA	Water	SM 4500 Cl G	
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	SM 4500 Cl G	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	SM 4500 Cl G	
LCS 490-260593/2	Lab Control Sample	Total/NA	Water	SM 4500 Cl G	
MB 490-260593/1	Method Blank	Total/NA	Water	SM 4500 Cl G	

QC Association Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - SOX Treatment

TestAmerica Job ID: 160-12404-1

Prep Batch: 260778

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	1664A	
490-81006-G-2-A MS	Matrix Spike	Total/NA	Water	1664A	
LCS 490-260778/2-A	Lab Control Sample	Total/NA	Water	1664A	
MB 490-260778/1-A	Method Blank	Total/NA	Water	1664A	

Analysis Batch: 260780

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	1664A	260778
490-81006-G-2-A MS	Matrix Spike	Total/NA	Water	1664A	260778
LCS 490-260778/2-A	Lab Control Sample	Total/NA	Water	1664A	260778
MB 490-260778/1-A	Method Blank	Total/NA	Water	1664A	260778

Prep Batch: 260993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	365.2/365.3/365	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	365.2/365.3/365	
580-50989-E-1-C MS	Matrix Spike	Total/NA	Water	365.2/365.3/365	
580-50989-E-1-D MSD	Matrix Spike Duplicate	Total/NA	Water	365.2/365.3/365	
LCS 490-260993/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	
MB 490-260993/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	

Analysis Batch: 261075

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	SM 4500 SO3 B	
160-12404-1 MS	TEST 2 STAGE 2 BLEACH	Total/NA	Water	SM 4500 SO3 B	
160-12404-1 MSD	TEST 2 STAGE 2 BLEACH	Total/NA	Water	SM 4500 SO3 B	
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	SM 4500 SO3 B	
160-12404-2 DU	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	SM 4500 SO3 B	
LCS 490-261075/2	Lab Control Sample	Total/NA	Water	SM 4500 SO3 B	
MB 490-261075/1	Method Blank	Total/NA	Water	SM 4500 SO3 B	

Analysis Batch: 261280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	SM 5220D	
490-81626-F-1 DU	Duplicate	Total/NA	Water	SM 5220D	
490-81626-F-2 MS	Matrix Spike	Total/NA	Water	SM 5220D	
490-81626-F-2 MSD	Matrix Spike Duplicate	Total/NA	Water	SM 5220D	
LCS 490-261280/5	Lab Control Sample	Total/NA	Water	SM 5220D	
MB 490-261280/4	Method Blank	Total/NA	Water	SM 5220D	

Analysis Batch: 261310

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-12404-1	TEST 2 STAGE 2 BLEACH	Total/NA	Water	365.4	260993
160-12404-2	TEST 2 STAGE 1-H2O WASH	Total/NA	Water	365.4	260993
580-50989-E-1-C MS	Matrix Spike	Total/NA	Water	365.4	260993
580-50989-E-1-D MSD	Matrix Spike Duplicate	Total/NA	Water	365.4	260993
LCS 490-260993/2-A	Lab Control Sample	Total/NA	Water	365.4	260993
MB 490-260993/1-A	Method Blank	Total/NA	Water	365.4	260993

Surrogate Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - SOX Treatment

TestAmerica Job ID: 160-12404-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(78-127)	(75-123)	(80-120)	(80-120)
160-12404-1 - DL	TEST 2 STAGE 2 BLEACH	106	100	99	96
160-12404-1 - DL2	TEST 2 STAGE 2 BLEACH	107	97	103	92
160-12404-2 - DL	TEST 2 STAGE 1-H2O WASH	108	95	102	92
160-12404-2 - DL2	TEST 2 STAGE 1-H2O WASH	103	100	103	97
LCS 160-197153/10	Lab Control Sample	114	99	104	101
LCSD 160-197153/11	Lab Control Sample Dup	111	97	107	98
MB 160-197153/13	Method Blank	113	96	112	96

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(83-117)	(84-120)	(85-115)	(85-115)
LCS 160-197849/4 - RA	Lab Control Sample	91	95	93	99

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	12DCE	TOL	DBFM
Lab Sample ID	Client Sample ID	(84-120)	(83-117)	(85-115)	(85-115)
160-12404-1	TEST 2 STAGE 2 BLEACH	94	100	97	97
160-12404-1 - DL	TEST 2 STAGE 2 BLEACH	97	110	96	106
160-12404-1 MS	TEST 2 STAGE 2 BLEACH	96	93	100	97
160-12404-1 MSD	TEST 2 STAGE 2 BLEACH	93	91	100	94
160-12404-2	TEST 2 STAGE 1-H2O WASH	94	95	98	94
160-12404-2 - DL	TEST 2 STAGE 1-H2O WASH	97	92	96	92
LB 160-196524/1-A	Method Blank	98	102	92	100

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
12DCE = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Surrogate Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - SOX Treatment

TestAmerica Job ID: 160-12404-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	PHL	TPH
Lab Sample ID	Client Sample ID	(47-103)	(30-99)	(10-74)	(31-105)	(10-50)	(68-116)
160-12404-1	TEST 2 STAGE 2 BLEACH	64	68	47	80	37	60 X
160-12404-2	TEST 2 STAGE 1-H2O WASH	58	70	46	137 X	44	60 X
LCS 160-197376/2-A	Lab Control Sample	77	77	52	77	37	70
LCSD 160-197376/3-A	Lab Control Sample Dup	79	80	54	80	38	71
MB 160-197376/1-A	Method Blank	70	78	57	82	42	69

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	PHL	TPH
Lab Sample ID	Client Sample ID	(49-100)	(45-94)	(46-92)	(51-98)	(37-95)	(60-113)
LB 160-197372/1-A	Method Blank	70	79	68	81	56	72
LCS 160-197372/2-A	Lab Control Sample	73	79	66	79	57	73

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	PHL	TPH
Lab Sample ID	Client Sample ID	(49-100)	(45-94)	(46-92)	(51-98)	(37-95)	(60-113)
160-12349-H-1-N MS	Matrix Spike	70	75	52	107 X	13 X	65
160-12349-H-1-O MSD	Matrix Spike Duplicate	71	74	50	104 X	16 X	65
160-12404-1	TEST 2 STAGE 2 BLEACH	0 X	81	6 X	166 X	5 X	73
160-12404-2	TEST 2 STAGE 1-H2O WASH	69	77	150 X	222 X	75	67

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

Surrogate Summary

Client: Republic Services Inc
Project/Site: Bridgeton Landfill - SOX Treatment

TestAmerica Job ID: 160-12404-1

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		DCB2	TCX2
Lab Sample ID	Client Sample ID	(43-131)	(44-115)
LCS 160-197348/2-A	Lab Control Sample	74	98

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Water — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)	
		DCB2	TCX2
Lab Sample ID	Client Sample ID	(43-131)	(44-115)
160-12387-B-1-J MS	Matrix Spike	93	67 p
160-12387-B-1-K MSD	Matrix Spike Duplicate	96	105
160-12404-1	TEST 2 STAGE 2 BLEACH	85	0 X
160-12404-2	TEST 2 STAGE 1-H2O WASH	93	124 X
LB 160-196535/1-D	Method Blank	73	89

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

Method: 8151A - Herbicides (GC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		DCPA1	DCPA2
Lab Sample ID	Client Sample ID	(56-147)	(56-147)
LB 160-197374/1-A	Method Blank	97	96
LCS 160-197374/2-A	Lab Control Sample	132	129

Surrogate Legend

DCPA = 2,4-Dichlorophenylacetic acid

Method: 8151A - Herbicides (GC)

Matrix: Water — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)	
		DCPA1	DCPA2
Lab Sample ID	Client Sample ID	(56-147)	(56-147)
160-12404-1	TEST 2 STAGE 2 BLEACH	1519 X	1496 X
160-12404-1 MS	TEST 2 STAGE 2 BLEACH	917 X	1035 X
160-12404-1 MSD	TEST 2 STAGE 2 BLEACH	771 X	788 X
160-12404-2	TEST 2 STAGE 1-H2O WASH		111

Surrogate Legend

DCPA = 2,4-Dichlorophenylacetic acid