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November 30, 2020

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Mr. Greg Cassidy
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via FedEx

RECEIVED
DEC 04 2020
SITE ASSESSMENT, REMEDIATION, & REVITALIZATION

Reference: Revised Focused Feasibility Study
Former Joslyn Clark, LLC Facility
2013 W. Meeting Street
Lancaster, South Carolina
VCC 13-5875-RP

Dear Greg:

On behalf of Joslyn Clark Controls, LLC (Joslyn Clark), ERM NC, Inc. (ERM) would like to submit a revised *Focused Feasibility Study* for the reference project site. An electronic copy of the report is included on a CD.

The initial *Focused Feasibility Study* was submitted to your department on March 26, 2020. A response letter, dated May 5, 2020, requested further discussion of site risks, site specific implementation information for each technology, adjustments of technology rankings, and estimated costs of each technology. The revised *Focused Feasibility Study* addresses these requests.

If you have any questions, please do not hesitate to contact us at 704-541-8345.

Sincerely,

Rick Tarravechia, P.G.
Partner in Charge

Project Manager

Enclosures

Cc: David Bozaan – Joslyn Clark

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FORTIVE

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Focused Feasibility Study
VCC No. 13-5875-RP

Former Joslyn Clark Controls Facility
2013 W. Meeting Street, Lancaster, South Carolina

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23 November 2020

Project No.:0529667

The business of sustainability

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23 November 2020

Focused Feasibility Study
VCC No. 13-5875-RP

Former Joslyn Clark Controls Facility
2013 W. Meeting Street, Lancaster, South Carolina

Michael Pressley
Project Manager

Rick Tarravechia, P.G.
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CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

1. INTRODUCTION

ERM NC, Inc. (ERM) has prepared this Focused Feasibility Study (FFS) on behalf of Joslyn Clark Controls LLC (Joslyn Clark) to identify, develop and evaluate remedial action alternatives to address groundwater contamination for the former Joslyn Clark facility in Lancaster, South Carolina (Site). The work is being conducted per the requirements of the Voluntary Cleanup Contract (VCC) 13-5875-RP executed October 2, 2013 between the SCDHEC and Joslyn Clark.

The FFS process considers the results of previously completed remedial investigations (RI), field pilot studies, previous groundwater remediation activities and the requirements of the SCDHEC in selecting remedies for impacted media at the Site. This FFS is designed to conform to the applicable requirements in the Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (US EPA 1988) ("EPA Guidance").

1.1 Property Description and Background

The former Joslyn Clark facility is located at 2013 West Meeting Street in Lancaster, Lancaster County, South Carolina approximately three miles west of downtown Lancaster. The general location of the property and the physiographic features of the surrounding area are shown on Figure 1, developed from the United States Geological Survey (USGS) 7.5-minute quadrangle for Lancaster, South Carolina, dated 1974. The approximate coordinates of the Site are: latitude 32.7216 degrees N; longitude 80.82448 degrees W.

The Subject Property consists of 23 acres of land and is developed with two buildings (Lancaster Parcel ID 0066-00-031.00). The manufacturing building was constructed in 1964 and consists of approximately 180,000 square feet of floor space. The warehouse/storage building was constructed in 1967 and consists of approximately 14,400 square feet of floor space. An employee /visitor parking lot are located on the north side of the manufacturing building and trailer parking is located on the southwest side of the manufacturing building. A railroad spur is located in the southwest corner of the Site, which is connected to a rail line that runs along the southern property boundary. The southeast portions of the Site are wooded and the northwest portions are grass-covered. The property is bounded to the east by an apartment complex. Adjacent properties to the south and west are wooded and/or undeveloped. West Meeting Street bounds the Subject Property to the north and development farther north include a mobile home park, and small businesses.

The Subject Property was used to manufacture electrical control equipment for fire safety purposes from 1964 until 2009 when operations ceased. Figure 2 illustrates the general property layout.

The property was vacant from 2009 until 2016 when it was purchased by Makrochem, who uses the Site to transfer carbon black from bulk quantities (e.g., railcars and tankers) to smaller quantities (e.g. super sacks) for warehousing and subsequent distribution to off-Site locations.

Land use in the vicinity of the former Subject Property is a mix of residential, commercial, and wooded undeveloped property. According to Lancaster County, the Subject Property is zoned for industrial activity.

1.2 Former Off-Site Wastewater Lagoon

A summary of the previous environmental assessments is provided below. Of note is the presence of two former off-site wastewater lagoons located near the Site's southwest property line. The lagoons were previously closed under SCDHEC supervision. Closure activities reportedly included excavation and

disposal of sludge and backfilling with clean material during the 1980s. An onsite groundwater monitor well (MW-9) and soil samples adjacent to the former off-site lagoons have detected various contaminants associated with the lagoons. It appears that this “lagoon plume” (as opposed to the Joslyn Clark “building plume”) has affected onsite groundwater and soil in the southwestern most area of the Site. As stated in the Voluntary Cleanup Contract with SCDHEC dated May 14, 2013, “at no time did [Joslyn Clark] ever own or operate the 2.63 acre parcel upon which the former lagoons were located.” Additionally, verbal communication with SCDHEC and ERM’s remedial investigation reports make it clear that contaminants from the former lagoon that have migrated onsite are not the responsibility of Joslyn Clark, and are therefore not included or discussed further in this report. ERM understands that SCDHEC has already had discussions with the current owner and responsible party for the off-site lagoons.

1.3 Summary of Previous Investigations

Investigation	Date, Consultant	Description
Phase I Environmental Site Assessment (ESA) Report	January 2009, ERM	A Phase I ESA was conducted on behalf of Joslyn Clark by ERM. The Phase I ESA identified potential environmental concerns related to former off-Site wastewater lagoons (discussed above), a former onsite metal plating operation, and a former onsite degreasing operation that took place near the northwest corner of the plant, which used trichloroethylene (TCE) as a solvent.
Phase II Site Assessment Report	December 2009, ERM	Phase II ESA activities conducted in 2009 included the installation of 15 soil borings and seven permanent monitor wells (MW-1 through MW-7) to assess areas of potential environmental concern identified in the Phase I ESA. Results showed TCE was detected in several soil samples at low concentrations. TCE was also detected in groundwater samples collected from four monitor wells at concentrations ranging from 7.7 micrograms per liter (µg/L) to 2,700 µg/L, which is above the established South Carolina Maximum Contaminant Level (MCL) for TCE of 5.0 µg/L
Sensitive Receptor Survey (SRS)	January 2011, ERM	The SRS indicated that the closest water supply well to the Site is located at a trailer park approximately 645 feet upgradient from the Site, and according to the property owner the identified well is not in use. The next closest water well is almost 3,500 feet upgradient from the Joslyn Clark Site.
Phase III Site Assessment	February 2012, ERM	Three additional shallow monitor wells (MW-8, MW-9 and MW-10) were installed to further evaluate the horizontal extent of the VOC plume. Two deep wells (MW-3D and MW-10D) were installed to evaluate the vertical extent of VOC impacted groundwater at the Site. Groundwater samples collected during the Phase III activities showed multiple VOCs, with TCE and PCE being the most prevalent. TCE was detected in each Site well except MW-5, MW-10, and MW-10D. MW-9, located adjacent to one of the former off-site lagoons, contained elevated concentrations of TCE and other VOCs. As stated in Section 1.2, assessment and clean-up of impacts from the former lagoons are the responsibility of others.
Passive Soil Gas Survey	November 2012, ERM	60 soil gas points were installed in the northwest portion of the manufacturing building. Twenty-five (25) VOCs were identified in the

Investigation	Date, Consultant	Description
		soil gas samples. The highest VOC concentrations were found at two locations in the northwest portion of the building, in the vicinity of the former wastewater treatment room, and former paint booth and sump (southwest portion of building).
Human Health Risk Assessment (HHRA)	September 2013, ERM	The HHRA indicated there is limited risk/hazard to human health receptors at the Site, with the exception of vapor intrusion risk for Site/ maintenance workers who may be exposed to organic vapors migrating from groundwater, and to a lesser extent construction workers who may contact impacted subsurface soil affected by thallium during future excavation or trenching activities. It should be noted that subsequent indoor air sampling in 2014 and 2015 (discussed below) eliminated the vapor intrusion risk, therefore the only remaining potential risk is direct contact with soil affected by thallium for construction workers. However, thallium is naturally occurring, is not a chemical of concern that was used at the Site, and the HHRA concluded “Potential exposure with thallium is limited, if occurring at all.”
Pre-Remedial Assessment Report	September 2013, ERM	Five soil boings were installed to further investigate areas of elevated soil gas in the building. A temporary shallow well was installed in the building, and a group of shallow, intermediate, and deep wells (MW-11 group) were installed in the former paint booth room.
Feasibility Study (FS) Work Plan	November 2013, ERM	The *FS Work Plan* evaluated various remedial technologies against the EPA criteria for feasibility studies. In-Situ Chemical Oxidization (ISCO) was selected as the technology with the highest potential for success at the Site.
Initial Vapor Intrusion (VI) Assessment	May 2014, ERM	Six sub-slab soil gas samples were collected along with six co-located indoor air samples, plus a seventh stand-alone indoor sample in May 2014. Four soil gas samples exceeded a published Regional Screening Level (RSL). TCE was the most prevalent VOC detected, and was detected in each sub-slab sample at concentrations ranging from 6.4 to 28,000 µg/m^3. The sub slab soil gas RSL threshold is 30 µg/m^3. Trace concentrations of TCE was detected in six of the seven indoor air samples at concentrations below the laboratory’s reporting limit.
ISCO Pilot Test Work Plan & Addendum	April and May, 2014	A Work Plan and Addendum were prepared to detail an ISCO pilot test inside the building at MW-3, where the highest VOC concentrations were detected in shallow groundwater.
ISCO Injection Pilot Test	July 2014 (Event) September 2015 (Report), ERM	The ISCO injection pilot test was performed during June 3 through July 2, 2014. Approximately 2,000 gallons of 5% sodium permanganate solution were injected across four well near MW-3. Post injection monitoring was performed on a quarterly basis thereafter. TCE concentrations in MW-3 decreased from over 3,000 µg/L to less than 3 µg/L at the 270 day mark before a slight rebound to 13.9 µg/L was noted at the end of the one year study period.

Investigation	Date, Consultant	Description
Downgradient Well Pair Installation (On-Site)	April 2015	A shallow and deep well nested pair (MW-12 and MW-12D) were installed along the southern property boundary to further characterize the VOC plume.
Additional VI Assessment	May 2015, ERM	A second VI study was performed at the manufacturing building during February 2015, which was a seasonal "worst case scenario" with sub slab and indoor air sample at the same locations as the May 2014 event. Detected soil gas compounds were similar to those detected in May 2014. TCE continued to be the most prevalent VOC detected with concentrations in soil gas ranging from 1.4 to 15,000 µg/m^3. However, concentrations of TCE and other VOCs in soil gas showed a 50% reduction since the May 2014 event. TCE was detected in five of the seven indoor air samples at concentrations ranging from 0.672 µg/m^3 to 2.54 µg/m^3. These concentrations were below the industrial RSL for TCE, which is 3.0 µg/m^3. Therefore, there is no risk from indoor air and the vapor intrusion pathway is closed.
Monitor Well Installation and Site Sampling	June 2018, ERM	Two intermediate and one shallow well were installed in December 2017 to further characterize the plume. A Site-wide sampling event took place in February 2018.
Monitor Well Installation and Site Sampling	July 2019, ERM	An off-Site well pair were installed (MW-15 and MW-15D) in March 2019 to further characterize the plume. A Site-wide sampling event took place in April 2019.
Groundwater Monitoring Reports	April 2020	Site-wide groundwater monitoring events were conducted in December 2019 and May 2020.
Human Health Risk Assessment (HHRA)	October 2020	The HHRA evaluated new soil, soil gas, indoor air, and groundwater data collected since the previous HHRA in 2013. The results of the HHRA indicate that there is no unacceptable risk/hazard to human health receptors at the site, or on the property downgradient.

2. SITE CHARACTERISTICS

2.1 Topography

The Site property generally slopes to the southeast and southwest towards two off-Site drainage features. One feature is located approximately 500 feet southeast of the eastern property boundary and the second is located approximately 1,100 feet west of the western property boundary. Both drainage features discharge into Cane Creek, which is located approximately one mile south-southeast of the Subject Property.

2.2 Receptor Survey

The Lancaster Water and Sewer District supplies potable water to the area surrounding the subject facility. In 2011, a receptor survey conducted by ERM noted that twelve water supply wells were

identified within the study area, i.e. within 1.0 mile (5,280 feet) of the Subject Property's center (see Figure 3). The closest well to the Site is located approximately 645 feet north (hydraulically upgradient to the subject Site) at 2048 West Meeting Street, and is reportedly not in use. There are no impacted or threatened water supply wells in proximity to the contaminant plume.

Cedar Pines Lake is approximately 5,280 feet north and upgradient of the subject Site. The lake is fed from a tributary of Cane Creek, which flows south to southwest into the Catawba River. An unnamed pond is located 2,600 feet southeast of the Site's southeastern property corner (side gradient from the Site). There are no known surface water intakes within one mile of the Site. The VOC plume has been delineated vertically and laterally downgradient, as discussed in Section 4.2, which shows that there is no risk of discharge of the VOC plume to any surface water bodies. Based on these results, there is no risk of discharge of the VOC plume to any surface water bodies, and no known use of groundwater or surface water at or near the Site that would be impacted by the release.

2.3 Conceptual Site Hydrogeological Model

The Site is located within the Western Piedmont Physiographic Province of South Carolina. According to the Geologic Map of South Carolina (1997) and *The Geology of the Carolinas, Horton and Zullo, 1991*, the Lancaster area is located within the Charlotte Belt and is specifically underlain by mica gneiss.

The shallow subsurface consists of saprolite, a layer of weathered and variably decomposed bedrock that is an orangish-brown, fine-grained, sandy silt. The saprolite thickness varies across the site, but generally extends to depths of 50 to 110 feet below land surface (bls). The saprolite grades to a partially weathered rock (PWR) zone (transition zone) which occurs between the saprolite and underlying competent bedrock. PWR is a tan siltstone that is present at 50-75 feet bls beneath the building and along the southern property boundary, but it appears to be absent or at depths of greater than 110 feet midway between the building and the southern property line. Additionally, PWR is absent at the MW-15 offsite location, where the saprolite grades directly into competent bedrock at approximately 70 feet below grade. Competent bedrock was encountered at 143 feet beneath the manufacturing building (at MW-11D) and approximately 108 ft bls along the southern property boundary (at MW-12D).

The conceptual model for the Site is based on the hydrogeologic model for the Piedmont and Blue Ridge Regions as described by LeGrand and Mondorff (1952), LeGrand (1967), and Heath (1984). This model indicates that the occurrence and movement of groundwater in the Piedmont province is within two separate, but interconnected, water bearing zones. A shallow water-bearing zone generally occurs within the saprolite zone, and a deeper aquifer zone occurs within the underlying bedrock.

Groundwater in the shallow saprolite zone occurs in the interstitial pore space of the saprolite. The depth to groundwater in the saprolitic zone at the subject Site ranges from 42 to approximately 50 feet below land surface (bls). Subsurface investigation activities at the Site indicate that the saprolite aquifer zone (which includes PWR) extends from depths of 42 feet to 143 feet (approximately 101 feet of saturated zone). Groundwater flow in the saprolite and PWR zones is governed by water table conditions. This means that groundwater will flow under unconfined conditions and generally mimic topography. Therefore, groundwater movement will be from upland areas (recharge zones) to nearby surface streams (discharge zones, such as Cane Creek and its tributaries, farther to the southeast). Contaminant transport of VOCs typically follows the advective flow of groundwater. Groundwater in all wells (shallow and deep) at the Site flow to the south-southwest, towards Cane Creek, which is approximately 4,800 feet south-southwest of the southern property border at its closest point.

The hydraulic conductivity of the aquifer was determined using data from slug tests for monitor wells MW-3, MW-7, MW-11, MW-11I, and MW-11D. The data from the slug tests were analyzed using the Bouwer and Rice solution. Hydraulic conductivities determined from the rising head slug tests ranged from 0.0189 feet per day to 0.5111 feet per day in the shallow wells, 0.3481 feet per day in the intermediate well, and 1.1640 feet per day in the deep well. The results of the hydraulic conductivity tests are as follows:

Well Location	Hydraulic Conductivity (Feet/day)
MW-3	0.0281
MW-7	0.1104
MW-11	0.7391
MW-11I	0.4555
MW-11D	1.4373

Hydraulic gradients were calculated across the Site, along the southern flow path. As determined in the table below, the May 2020 hydraulic gradient is 0.0058 feet/foot.

Hydraulic Gradient – May 2020

Well ID	Reference Elevation	Depth to Water	Head Elevation	Head Change	Distance Change	Hydraulic Gradient
	(ft amsl)	(ft)	(ft)	(ft)	(ft)	(ft/ft)
MW-1	547.41	41.73	505.68	8.67	1,523	0.0057
MW-10	533.20	36.19	497.01			

amsl = above mean sea level

The average linear velocity for the saprolite aquifer at the Site was calculated according to following formula (Fetter, Jr., C.W., *Applied Hydrogeology*, Bell & Howell Co., Columbus, Ohio, 1985):

$$v = \frac{q}{n} = -\frac{K}{n}\left(\frac{dh}{dl}\right)$$

Using the geometric mean hydraulic conductivity (K) of 0.1319 feet per day for the saprolite wells (MW-3, MW-7, and MW-11), assuming an effective porosity (*n*) of 0.25 for silty sand, and a gradient (dh/dl) of 0.0057 (as measured between MW-1 and MW-10), the average linear velocity for the saprolite aquifer at the Site is 0.003 feet per day (1 foot per year).

Groundwater flow direction in the shallow and deeper aquifers is shown on Figures 4 and 5, respectively.

2.4 Source Area

During the course of the remedial investigation activities, three possible sources of the onsite TCE affected groundwater were identified. The first two source areas are suspected to involve a former TCE aboveground storage tank (AST) or possible degreaser of unknown capacity. The location of the tank/degreaser was not remembered by facility personnel during interviews in 2009, except that it was somewhere in the northwestern portion of the building. A discussion of these three areas is presented below:

Monitor Well MW-3: The first area is in the vicinity of monitor well MW-3, which until the ISCO pilot test (see Section 3 below) consistently exhibited the highest TCE concentrations in groundwater (2,700 to 3,200 µg/L). This well was installed adjacent to the former metals plating area (northwest portion of the building). A soil sample in this area (SB-3) contained 0.043 mg/kg TCE.

Soil Gas Sample SG-2: The second area is also in the northwestern portion of the building, around a single soil gas sample (SG-2, see Section 4.3), which detected elevated VOCs in soil gas. Soil samples in this area did not detect TCE or its daughter products, but 696 µg/L TCE was present in a direct push (GP-18) groundwater sample installed in the same location.

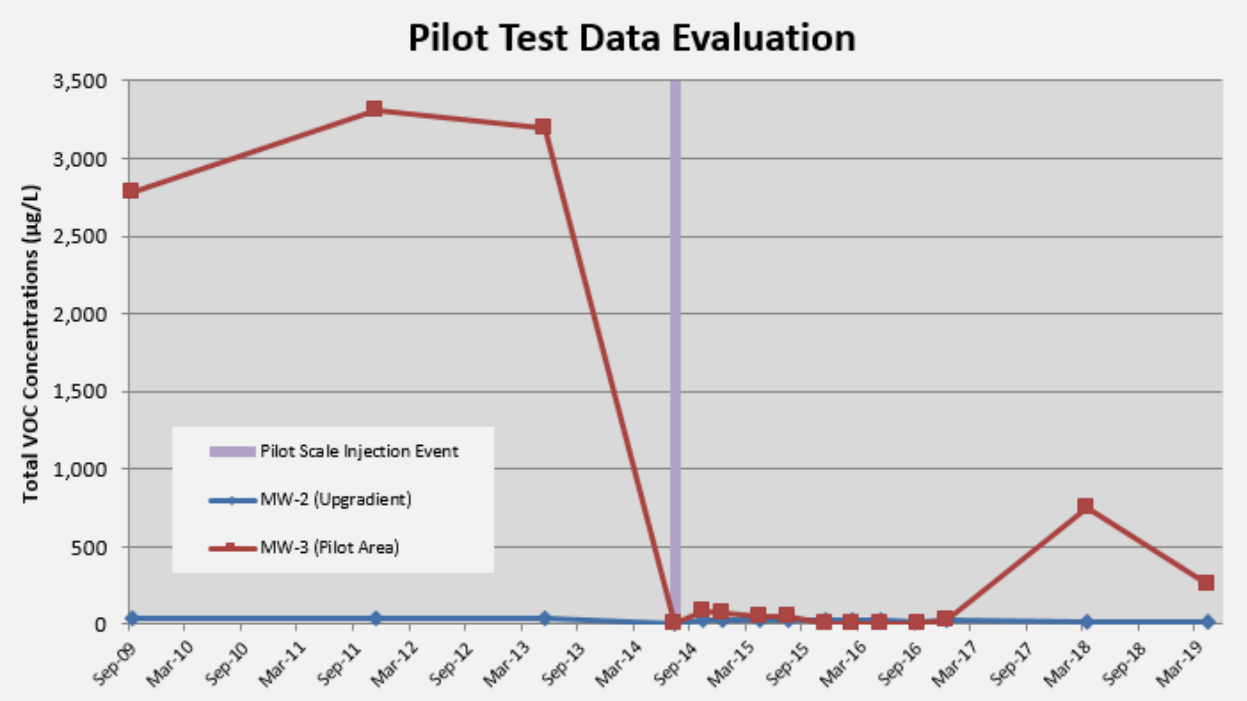
Former Paint Booth and Sump: The third area is in the southwestern portion of the building, in the former paint boot and cleaning line sump area. Multiple soil gas points installed in this area exhibited the highest soil gas concentrations for TCE and other VOCs. TCE was not detected in soil, although low levels of 1,4-dioxane were detected. Shallow groundwater contained up to 951 µg/L TCE; while up to 242 µg/L TCE was present at this location in the upper bedrock aquifer at 143 feet.

Based on all the lines of evidence, the former paint booth/sump area and the MW-3 area were thought to be the most significant sources of VOC mass for the reasons outlined above. As noted below in Section 3.1, an in-situ chemical oxidation pilot test was conducted in the MW-3 area. Based on the success of that study (over 90 percent sustained reduction in MW-3 over a five year period), no further remediation is recommended in that area. Therefore, future remediation efforts will focus on the former paint booth and sump area (see Section 5.4). It is anticipated that some additional assessment work to better define the source area may be conducted prior to implementation of the remedial technology.

3. SUMMARY OF PREVIOUS REMEDIAL ACTIVITIES

3.1 In-Situ Chemical Oxidation (ISCO) Pilot Test

As discussed in Section 1.3, a pre-remedial pilot test was conducted inside the manufacturing facility from June 3 through July 2, 2014. The results of the pilot test were submitted to SCDHEC in a report entitled *Pilot Test Results and Monitor Well Installation Report* dated September 15, 2015 (see Appendix A). The pilot test was conducted to evaluate the effectiveness of in-situ chemical oxidation in the saprolite aquifer to remediate source area mass. Approximately 2,000 gallons of 5% sodium permanganate solution were injected across four injection wells installed near MW-3. Post injection monitoring was performed on a quarterly basis thereafter. TCE concentrations in MW-3 decreased from 3,200 µg/L to less than 3 µg/L at the 270 day mark and 13.9 µg/L at the end of the one year study period. Five years following the injection, the TCE concentrations appear to be holding steady at 254 µg/L, which shows over ninety percent reduction of TCE mass with very limited rebound. A TCE concentration over time trend-graph for MW-3 is shown below.



The radius of injection influence during the pilot test was measured at over 15.5 feet, as evidenced by a strong purple color in MW-3 (9 feet from the injection point) and a light pink or purple hue in OW-1 (15.5 feet from the injection point). The presence of oxidant in MW-3 and OW-1 located downgradient of the injection wells indicates that delivery of the oxidant was achieved in the target shallow aquifer zone. In addition, manganese and sodium concentrations within the pilot test area wells showed marked increases, also indicating good distribution of oxidant in the pilot test area. The results of the pilot test indicate that ISCO using sodium permanganate is a viable remediation technique for the Joslyn Clark site.

4. NATURE AND EXTENT OF CONTAMINANTS

4.1 Soil

Unsaturated soil investigation activities took place between 2009 and 2011. Eighteen borings have been advanced at the Site to evaluate eight potential source areas. The borings were advanced to depths ranging from 4 feet bls to 47 feet bls, depending on the area of concern. Analyses of soil samples collected from the soil borings indicated that TCE was present in soil samples collected near the former metal plating area, the former degreasing operation, and the former hazardous waste storage shed on the Subject Property. TCE concentrations ranged from trace level (estimated concentrations below the reporting limit) to above the EPA Screening Level for Protection of Groundwater. None of the concentrations exceeded the health-based residential or industrial standards. Therefore, no further assessment or remediation of soil is planned. A summary of the maximum soil concentrations is presented below.

Summary of Soil Maximum Contaminant Concentrations (mg/kg)

Compound	Protection of Groundwater – Screening Level (mg/kg)	Maximum Concentration (mg/kg)
Trichloroethene	0.00061	0.043
cis-1,2-Dichloroethene	0.11	0.086
Xylenes (total)	0.23	0.097

Data from March 2009 soil sampling event.

Soil analytical results from 2009 to 2013 are presented in Tables 1 and 2 and the soil sampling locations are shown on Figure 6.

4.2 Groundwater

Based on the most recent sampling results (May 2020), COCs that remain in groundwater above SC MCLs include:

Summary of Groundwater Maximum Contaminant Concentrations (µg/L)

Compound	MCL Groundwater Standard (µg/L)	Maximum Concentration (µg/L)
Trichloroethene	5	320 (MW-11)
Tetrachloroethene	5	14 (MW-12D)
cis-1,2-Dichloroethene	70	3.9 (MW-13 I)
1,1-dichloroethene	7	37 (MW-11)
1,1-dichloroethane	Not Established (2.7 – tap water)	3.4 (MW-3)

Data from May 2020 groundwater sampling event.

The VOC-affected groundwater originates in the northwest portion of the manufacturing building and extends southward towards the southern property boundary. As discussed in Section 2.4, the source area is the former paint booth and sump area located in the southwestern portion of the building.

The highest TCE concentrations in groundwater are in the former paint booth and sump area (source area). The bulk of the source area VOC mass is in the shallow aquifer (320 µg/L) with lower concentrations (190 µg/L) in the bedrock. The May 2020 groundwater TCE analytical results for the shallow saprolite aquifer indicate that the plume, as defined by the 5 ug/L isoconcentration line, extends almost to the downgradient property boundary, as shown on Figure 7. The TCE plume within fractured bedrock, as defined by the 5 ug/L isoconcentration line, extends approximately 400 feet south of the property boundary and onto an undeveloped parcel as shown on Figure 8. A cross-section transect map is provided as Figure 9 and cross-sections A-A' and B-B', including TCE isoconcentration lines, are presented in Figures 10 and 11, respectively. Historical groundwater analytical data from 2013 through May 2020 is presented in Table 3.

4.3 Vapor Intrusion Evaluation

Soil vapor has been assessed in the former manufacturing building through a passive soil gas survey in 2012, a sub-slab and indoor sampling event in 2014, and then a follow-up sub-slab sampling event in

2015. The passive soil gas investigation included 60 soil gas points that were installed in the northwest portion of the manufacturing building. A map showing relative TCE concentrations (in nanograms) is shown on Figure 12.

In order to evaluate the potential for vapor intrusion in the building, six sub-slab soil gas samples were collected along with six co-located indoor air samples, plus a seventh standalone indoor sample in the office area. These samples were collected during May 2014 (sample locations are shown on Figure 13). A follow-up sub-slab and indoor air sampling event took place in February 2015, which was a seasonal "worst case scenario" with sub-slab and indoor air sample at the same locations as the May 2014 event. VI sample results from both events are summarized in Table 4 (sub-slab results) and Table 5 (indoor air results). Indoor air concentrations of TCE were below the RSL for Industrial Air, indicating that vapor intrusion is not a risk for workers at the Site.

4.4 Summary of Site Risks

Human health and risk assessments have been prepared in 2013 and 2020 to evaluate potential health impacts for current and future occupants of the former Joslyn Clark facility. Both carcinogenic and non-carcinogenic hazards were evaluated as part of the risk assessment. The primary risk at the Site is exposure of humans to affected groundwater. However, there is currently no use of groundwater in the plume area and this risk will be administratively mitigated in the future through the use of institutional controls prohibiting the use of groundwater for drinking or irrigation without the approval of SCDHEC. The potential for human receptors to be in contact with compounds of concern is unlikely based on the depth at which groundwater is present. Therefore, the results of the HHRA indicate that there is no unacceptable risk/hazard to human health receptors at the former Joslyn Clark facility. Further, using data collected in 2019 and 2020 from off-site downgradient monitoring wells, there is no unacceptable risk for hypothetical site workers who may conduct subsurface excavation/trenching activities or work in buildings constructed offsite under future conditions.

5. SUMMARY OF REMEDIAL ACTION OBJECTIVES AND REQUIREMENTS

The remedial alternative development process is initiated by developing remedial action objectives (RAOs) and identifying general response actions that address the RAOs and then performing an initial screening of potentially applicable remedial technologies. Potentially Applicable or Relevant and Appropriate Requirements (ARARs) are also presented in this section of the FFS as part of this initial screening process.

5.1 Applicable or Relevant and Appropriate Requirements

The selected remedy for remedial actions must attain or exceed the ARARs in environmental and public health laws. Identification of ARARs must be done on a Site-specific basis. A list of statutes and regulations that are being used in this FFS as ARARs for the remediation project is included in Table 6.

5.2 Remedial Action Objectives

Groundwater at the Site has been impacted with VOCs, primarily TCE and PCE, and the associated daughter products 1,1-dichlorothene (DCE) and cDCE (collectively, the “constituents of concern” or “COCs”) at concentrations that exceed the applicable standards. No impacts to unsaturated soil were identified at concentrations above the residential RSLs. Based on the receptors, media, exposure pathways and COCs identified at the Site, the primary Remedial Action Objectives (RAOs) were established:

- Remediate groundwater to prevent human consumption of groundwater that contains COCs in concentrations above the federal and state MCLs or other applicable or relevant and appropriate risk-based human health criteria;
- Reduce the contaminant mass in the source area and downgradient through the implementation of active remedial measures; and
- Monitor groundwater quality in the affected portion of the aquifer to determine if the plume is stable, increasing, or decreasing in response to remedial efforts.

While the ultimate source area groundwater remedial objective, consistent with prevailing regulations, is to meet the MCL, this goal is not likely to be achieved at the vast majority of chlorinated VOC sites in the source zones and “exclusive reliance on this goal inhibits the application of source depletion technologies because achieving this goal is generally beyond the capabilities of available in-situ technologies in most geologic settings” (USEPA, 2003). According to USEPA, 2008, “…well-implemented in situ remediation projects are likely to reduce source zone groundwater concentrations by about one to possibly two orders of magnitude (90 – 99% reduction) from pretreatment levels.” As such, a more appropriate source area groundwater remedial goal, based on an approach which has been accepted by USEPA (ITRC, 2010), is to reduce the mass discharge of contaminated groundwater from the source area by ninety-percent. The performance of these RAOs will be assessed against applicable remedial goals.

5.3 General Response Actions

A general response action (GRA) is a coarse or broad form of remedial option that is proposed and then refined into specific technologies or process options as the feasibility process proceeds. A summary of the different types of GRAs and examples of technologies that represent each action are included in the following table.

General Response Action	Description	Example
No Action (NA)	The no action response provides a baseline for evaluating the remedial alternatives available as required.	N/A
Institutional Controls (IC)	Non-engineered administrative or legal controls that limit land or resource use and are considered a limited action remedial alternative.	■ Deed restrictions ■ Groundwater use restrictions ■ Soil disturbance restrictions
Monitoring (M)	Monitoring groundwater is a limited remedial action alternative that would provide data to assess the occurrence of monitored natural attenuation (MNA) of contamination at a Site. Monitoring would verify the effectiveness of the natural attenuation processes and show that remediation of a groundwater aquifer can occur within a reasonable time frame without active treatment.	■ Monitored Natural Attenuation
Containment/ Engineering Controls	Containment response actions are used to isolate the contaminated media and to restrict migration of contaminants. Since containment response actions do not have a treatment component, they do not reduce the concentration or volume of contaminants.	■ Engineered caps ■ Physical contaminant including slurry walls
Active Restoration - Extraction, Treatment, Discharge	Reducing COC concentrations in soils or groundwater to levels below clean-up criteria by extracting soils or groundwater to the surface, removing the contaminants, and discharging or disposing of the clean media by various methods.	■ Soil excavation ■ Air sparge/soil vapor extraction ■ Hydraulic control (groundwater pump and treat)
Active Restoration – In Situ Treatment	Reducing COC concentrations in soil and groundwater by treatment in place.	■ In-situ bioremediation ■ In-situ chemical oxidation ■ Zero valent iron

Remediation technologies that fall within the GRA categories that were considered for use at this Site are outlined in Section 6.2.

5.4 Estimated Areas and Volume of Affected Media

The estimated areas and volumes of impacted media that exceed the regulatory standards were calculated based on the data collected as part of the remedial investigation and are presented in the table below. The treatment area is shown on Figure 14.

Areas and Volumes of Affected Media

Media	Estimated Area (Sq. Ft)	Estimated Volume (Cu. Yds.)	Comment
Unsaturated Soil	N/A	N/A	Soil samples collected in the manufacturing building were below industrial standards and mostly below residential standards.
Groundwater	2,500	11,100	Includes affected groundwater with VOC concentrations exceeding SC water quality standards.

5.5 Preliminary Remediation Goals

Preliminary remedial goals (PRGs) must be established for each constituent in soil, groundwater, and surface water that requires remediation. Groundwater PRGs are based on the Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act. Surface water PRGs are based on the South Carolina Water Quality Standards for the protection of human health and aquatic life. Where separate numeric criteria exist for a constituent, the most stringent of the criteria is applied and listed. Although the PRGs are established on regulatory standards (e.g. ARARs), the final acceptable exposure levels are determined based on the evaluation of expected exposures and associated risks for each alternative. The regulatory standards by affected media are presented below.

Preliminary Remedial Goals for Groundwater

Compound	Drinking Water MCL Standard[1]
Tetrachloroethene	5
Trichloroethene	5
cis 1,2-Dichloroethene	70
1,1-Dichloroethene	7
1,1-Dichloroethane	2.7*

MCL = Maximum Contaminant Level – standards set by USEPA for drinking water quality.

*MCL not established, tapwater recommendation used instead

5.6 Summary of Remediation Strategy

The proposed strategy for remediation at this Site is to protect potential receptors, reduce the overall contaminant mass at the Site, and reduce the overall risk associated with the Site through implementation of active remediation measures according to the following:

- **Source Area Remediation:** Source area remediation efforts will target the area of release where TCE is currently present at the highest concentrations. Once contaminant concentrations in the source area have been treated and the contaminant flux out of the source area is minimized, it is expected that naturally occurring attenuation will result in stable or decreasing contaminant concentrations in the downgradient areas not targeted by active treatment. The effectiveness of natural attenuation will be evaluated though performance monitoring.

- **Monitored natural attenuation (MNA):** will be evaluated following completion of active remediation measures in the source area to document and track the decreasing contaminant concentration trends throughout the plume. Natural attenuation is the reduction in concentrations of COCs in groundwater over time and distance due to naturally occurring physical, chemical, and biological processes. Natural attenuation includes both destructive (e.g., biodegradation, abiotic degradation) and non-destructive (e.g., dispersion, dilution, adsorption, volatilization) mechanisms.

5.7 Remediation Problem Statement

The following table provides a summary of the remediation problem statement for source area remediation.

Remediation Problem Statement

Parameter	Site Specific Description
Main COC	TCE
Highest COC Concentration	The highest TCE concentration in groundwater is 320 µg/L in monitoring well MW-11. Prior to the ISCO pilot test, the highest concentration of TCE detected at the site was 3,120 µg/L in monitoring well MW-3
Depth to water	Approximately 40 ft bgs
Depth to competent bedrock	Approximately 160 ft bgs
Location of Treatment Area	Inside active manufacturing building
Thickness of Saturated Treatment Area	Approximately 120 ft
Soil Type/Permeability	Sand silt and clay mixture with an estimated permeability coefficient of 10^{-6} cm/second
Groundwater characteristics	Aerobic groundwater (DO ~ 6 mg/L and ORP > 150 mV) and a neutral pH (between 5 and 7)

The site specific data provided in the table above were used to eliminate technologies that could not be effectively implemented under site specific conditions from further consideration during the Preliminary Screening Process (Section 6.0) and evaluate the potential efficacy of retained remediation technologies in the detailed screening (Section 7.0).

5.8 Feasibility Study Screening Process

In accordance with SCDHEC procedures, the feasibility study (FS) process outlined by USEPA, 1998 was used as general guidance for evaluating potential remedial options. Site-specific hydrogeologic conditions and the nature of COCs present at the Site were used to identify potential corrective action technologies. A scoring process has been applied to each set of potential corrective action alternatives to aid in the identification of the most technologically feasible and economically practicable alternatives.

The feasibility study screening process for this Site has been divided into the following two phases:

1. **Preliminary Screening Process:** Remediation technologies are screened based on their ability to be successfully implemented for the Site-specific problem statement and under Site-specific conditions for each area requiring active remediation measures. For this Site, remediation

technologies were screened based on their ability to be successfully implemented in both the source area, as well as downgradient of the source.

2. **Detailed Screening Process:** The remediation technologies identified during the preliminary screening process for both the source area and the stream protection area are grouped together into Site wide remedial alternatives and then compared to the EPA screening criteria.

The preliminary screen process is detailed in Section 6.0 for both potential source area treatment technologies, as well as stream protection treatment technologies. The remediation technologies retained as part of the preliminary screening process are grouped into Site wide remediation alternatives and the detailed analysis of the developed remediation alternatives is provided in Section 7.0.

6. PRELIMINARY SCREENING OF REMEDIATION TECHNOLOGIES

6.1 Description of Preliminary Screening Process

During the preliminary screening process, technologies are screened based on implementability in Site-specific conditions. The general categories for Site-specific conditions used for screening are listed below.

Preliminary Screening Criteria	Site Specific Criteria Used for Evaluation
Would or would not be effective for the volume or area of contaminated media that requires remediation	Depth to groundwater Depth to confining unit
Would or would not be an effective method for clean-up for Site COCs	Constituents of concern
Would or would not be feasible based on Site conditions	Geology/mixed permeability pH of groundwater DO/ORP of groundwater
Could or could not be effectively administered	Contaminant trends Technology specific parameters Application specific parameters

Technologies that can be implemented under the Site-specific conditions are retained for further evaluation. This phase of the feasibility study process does not differentiate between technologies that may be more successful or appropriate than other technologies. The technologies that were not retained for further consideration at the Site were eliminated based on incompatibility with site specific conditions are summarized in the following table.

Summary of Technologies Not Retained for Groundwater Treatment

Remediation Technology	Reason Technology Was Not Retained
Anaerobic Bioremediation – Sulfate Reduction	The site specific COCs (primarily TCE) cannot be effectively treated by sulfate reducing bacteria.
Aerobic Bioremediation	The site specific COCs (TCE) cannot be effectively treated by aerobic bacteria.
Phytoremediation	The existing building structure and active nature of the facility (the proposed treatment area is inside the building) prohibits implementation

Air Sparge/Soil Vapor Extraction	The thickness of the saturated treatment area (over 100 ft of saturated aquifer) and the fine-grain nature of site soils (low permeability) prohibit effective implementation of this technology.
Thermal Remediation	Thermal remediation is typically and most effectively implemented at sites where high concentrations of contaminants indicative of free product are present in the subsurface. The highest concentration of TCE present at this site is less than 0.03% of the aqueous solubility for TCE indicating that free product is not present and the technology selected should be appropriate for remediation of a low concentration dilute groundwater plume.

6.2 Remediation Technologies Retained for Detailed Analysis

Eleven technologies to treat groundwater impacts were considered for implementation in the source area as part of the feasibility process. Six technologies were retained for further consideration during the detailed screening process. The technologies that were not retained for further consideration could not be effectively implemented or were not appropriate for implementation in the source area under Site-specific conditions. The technologies that were retained for further consideration are listed below.

- Anaerobic Bioremediation (Reductive Dechlorination)
- In-Situ Chemical Oxidation (ISCO)
- Hydraulic Containment
- Zero Valent Iron
- Monitored Natural
- No Action

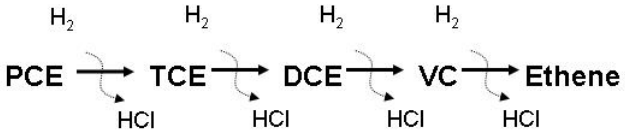
The technologies listed above were retained for further detailed evaluation against the nine EPA screening criteria. In addition to those technologies listed above, SC DHEC requires that No Action and Monitored Natural Attenuation be evaluated against the nine EPA screening criteria at every site. A description of the technologies that were retained for the detailed screening is provided in Section 7.0.

7. DESCRIPTION OF RETAINED TECHNOLOGIES

7.1 Anaerobic Bioremediation (Chlorinated Ethenes)

7.1.1 Description of the Technology

The chlorinated ethenes PCE and TCE can be biologically transformed by dehalorespiring bacteria into non-chlorinated organic compounds under anaerobic conditions. Dehalorespiring bacteria sequentially replace chlorine atoms in chlorinated ethenes with hydrogen. This process is referred to as reductive dechlorination. This reaction provides energy for growth to the bacteria and reduces chlorinated compounds to naturally occurring non-chlorinated organic compounds such as ethene and ethane. The transformation of PCE to ethene by dehalorespiring bacteria is depicted below.



Biological transformation (reductive dechlorination) of chlorinated ethenes

Simple organic compounds, such as lactate, can be added to the subsurface to stimulate the growth of dehalorespiring bacteria and consequently promote the reduction of chlorinated ethenes. These organic compounds serve as "food" for the dehalorespiring bacteria, providing a source of energy and carbon for the bacteria.

Several strains of bacteria are capable of transforming PCE and TCE to the lesser chlorinated daughter products cis-DCE and vinyl chloride (VC), however, Dehalococcoides species (DHC) bacteria must be present to degrade vinyl chloride to ethene. DHC bacteria are not always abundantly present in the subsurface, but can be added with the carbon substrate during injection to promote complete degradation of PCE and TCE to ethene.

The carbon substrate required to drive the reactions can be delivered to the subsurface either through permanent injection wells or direct push injection points. During the injection process, reagents are delivered radially from the injection well to develop a carbon-amended radius of influence (ROI) and are then carried downgradient through advective groundwater flow. Biological consumption and dilution reduce the strength of the injected carbon, which is measured as total organic carbon (TOC), downgradient of the injection well. Therefore, periodic injections are required to maintain excess TOC within the injection zone. Injection solution strength and injection frequency are key design parameters that ensure optimum TOC concentrations are maintained within the treatment zone.

7.1.2 Site Specific Evaluation

Several indicators are used to predict the potential success of anaerobic bioremediation. These indicators include DO, ORP, pH, TOC, and the presence of anaerobic degradation products in groundwater. The parameters DO, ORP, pH, and TOC should be within the operating ranges indicated below in order for anaerobic biodegradation to occur.

Parameter	Optimal Operating Range	Source Area Concentrations (Shallow/Intermediate Depths)
Dissolved Oxygen	Less than 2 mg/L	Greater than 6 mg/L
ORP	Less than 0	Greater than 150
pH	Between 5 and 7	Between 5 and 7
TOC	Greater than 20 mg/L	< 1 mg/L (3.9 mg/L in MW-11D)

The lack of naturally occurring carbon and the aerobic nature of the shallow (and intermediate depth) aquifer in the source area indicate that enhanced bioremediation may not be the best remedial option for the source area. Also, the lack of widespread TCE daughter products in groundwater at the Site indicates that bioremediation is not occurring naturally under the current Site conditions, and therefore biostimulation will likely take a prolonged timeframe to effectively implement.

A preliminary conceptual design was developed for implementation of anaerobic bioremediation in the source area at the Site. A summary of the design parameters, the estimate duration of active remediation, and the estimated cost for implementation is provided in the following table.

Anaerobic Bioremediation Conceptual Design Parameters

Design Parameter	Conceptual Design Value
Number of Injection Wells	12
Injectant	2,000 gallons of a 20% wt/wt carbon solution per well
Number of Injection Events	6
Post Remediation Controls	MNA would be required to treat the downgradient plume, Institutional Controls, including groundwater use restrictions at a minimum, would be implemented to reduce risk
Duration of Active Remedy	7 - 8 years
Time Required to Meet Groundwater Standards Throughout the Plume	> 10 years
Estimated Cost for Implementation*	$1.7M
Remedy Certainty	Moderate to Low Successful implementation of bioremediation is dependent on the ability of DHC to thrive. The aerobic aquifer, low TOC, and lack of anaerobic bioremediation daughter products indicates that anaerobic bioremediation is not naturally occurring at this site. Implementing bioremediation under this conditions can be challenging.

*Cost is for active remediation only and does not include on-going groundwater monitoring

7.2 In-Situ Chemical Oxidation (ISCO)

7.2.1 Description of the Technology

Chemical oxidation is a direct chemical reaction involving the application or injection of oxidants into groundwater to destroy or chemically transform the contaminants. When a material is oxidized it is converted to a higher valence state. Typically with organic chemicals (carbon based) this results in their conversion to carbon dioxide (CO_2) and water (H_2O).

There are a number of oxidants that can be used to remediate VOCs. They are, in order of decreasing oxidative strength, ozone, persulfate, hydrogen peroxide, and permanganate. Of these oxidants, persulfate and permanganate are the most widely used and are generally commercially available.

An effective technique to deliver the oxidant involves injection of the oxidant solution into the aquifer via a direct push rig or permanent wells, thus the reaction will occur in-situ. As such, this remedial approach is often referred to as in-situ chemical oxidation (ISCO).

Oxidants injected in the subsurface will react with any organic compounds encountered, including contaminants and naturally occurring organic matter. The background oxidant demand, known as the soil oxidant demand (SOD) is measured prior to oxidant delivery so that sufficient oxidant can be delivered to

the subsurface to oxidize both the naturally occurring organic matter and the contaminants targeted by ISCO.

7.2.2 Site Specific Evaluation

As discussed in Section 3.1, an onsite pilot test was conducted that successfully demonstrated that ISCO can be implemented under the site-specific conditions. A reduction of over 90 percent of the contaminant mass was achieved with very limited rebound over a five year period.

A preliminary conceptual design was developed for implementation of ISCO in the source area at the Site. A summary of the design parameters, the estimate duration of active remediation, and the estimated cost for implementation is provided in the following table.

ISCO Conceptual Design Parameters

Design Parameter	Conceptual Design Value
Number of Injection Wells	12 wells
Injectant	2,000 gallons of 5% wt/wt sodium permanganate
Number of Injection Events	5
Post Remediation Controls	MNA would be required to treat the downgradient plume, Institutional Controls, including groundwater use restrictions at a minimum, would be implemented to reduce risk
Duration of Active Remedy	5 – 6 years
Time Required to Meet Groundwater Standards Throughout the Plume	> 10 years
Estimated Cost for Implementation*	$1.1M
Remedy Certainty	High Pilot testing data collected for this technology at this Site indicate that ISCO can be effectively implemented at this Site.

*Cost is for active remediation only and does not include on-going groundwater monitoring

7.3 Hydraulic Containment

7.3.1 Description of the Technology

Hydraulic containment involves installing a series of groundwater extraction wells perpendicular to groundwater flow in a configuration that allows capture of the COC plume and prevents further downgradient migration. The main components of a hydraulic containment system (i.e., groundwater-pump-and-treat technology) include groundwater extraction, groundwater treatment and discharge of treated water.

Groundwater extraction wells are installed within or downgradient of affected areas to intercept the dissolved-phase COC plume. The extracted groundwater would then be treated, if necessary to achieve discharge limits, by a number of processes, including air stripping, activated carbon, or

chemical/ultraviolet oxidation. The treated groundwater is discharged to surface water or the local publically owned treatment works (POTW) or re-injected into the aquifer under respective permits. Hydraulic containment is a proven technology that is effective at reducing off-site COC migration; however, its effectiveness at reducing COC concentrations and corresponding mass is limited. The reason it is limited is that the mass transfer rate of COCs from the sorbed phase to the dissolved-phase where it can be captured by groundwater extraction is low, and COC concentrations tend to drop during operation and rebound following shutting off the system.

7.3.2 Site Specific Evaluation

Implementation of hydraulic containment at this Site would include installation of groundwater extraction wells along the downgradient boundary of the Site to prevent off-site migration of the contaminant plume. A groundwater extraction well could also be placed in the source area to reduce migration of contaminant mass from the source area to the downgradient portions of the Site. In order to install the extraction well in the source area, power to drive the pumps and piping to transport the extracted groundwater would have to be installed within the active manufacturing facility.

A preliminary conceptual design was developed for implementation of ISCO in the source area at the Site. A summary of the design parameters, the estimate duration of active remediation, and the estimated cost for implementation is provided in the following table.

Hydraulic Containment Conceptual Design Parameters

Design Parameter	Conceptual Design Value
Number of Extraction Wells	12
Post Remediation Controls	MNA would be required to treat the downgradient plume, Institutional Controls, including groundwater use restrictions at a minimum, would be implemented to reduce risk
Duration of Active Remedy	10 years
Time Required to Meet Groundwater Standards Throughout the Plume	> 10 years
Estimated Cost for Implementation*	$2.2M
Remedy Certainty	High Hydraulic containment is a proven and established technology.

*Cost is for active remediation only and does not include on-going groundwater monitoring

7.4 Zero Valent Iron (ZVI)

7.4.1 Description of the Technology

Zero valent iron (ZVI) involves the introduction of iron particles to act as a bulk reducing agent to chemically reduce chlorinated ethenes via electron transfer. The process involves a contact reaction whereby the chlorinated ethenes dissolved in groundwater come into contact with the iron surface. Iron corrosion also produces free hydrogen, which is involved in the electron transfer process during biological reductive dechlorination. ZVI can be delivered to the subsurface either through soil blending or via pressurized injection. Because the ZVI amendment is a slurry, pressurized injection frequently results in incomplete distribution in the subsurface and consequently areas where limited to no treatment is

occurring. ZVI soil blending can occur with either soil mixing tooling on an excavator arm, which can reach depths of up to 40 feet below ground surface, or via large diameter auger blending, which can reach depths of up to 100 ft bgs.

7.4.2 Site Specific Evaluation

The active manufacturing facility present at the Site would not allow for use of large diameter auger blending and the treatment depth is too deep for soil blending with an excavator arm. Consequently, ZVI application at this Site, if implemented, would be limited to pressurized injection.

A preliminary conceptual design was developed for implementation of ZVI in the source area at the Site. A summary of the design parameters, the estimate duration of active remediation, and the estimated cost for implementation is provided in the following table.

ZVI Conceptual Design Parameters

Design Parameter	Conceptual Design Value
Number of Injection Points	73
Injectant	18,000 lbs ZVI per point
Number of Injection Events	1
Post Remediation Controls	MNA would be required to treat the downgradient plume, Institutional Controls, including groundwater use restrictions at a minimum, would be implemented to reduce risk
Duration of Active Remedy	6 months
Time Required to Meet Groundwater Standards Throughout the Plume	> 10 years
Estimated Cost for Implementation*	$6.3M
Remedy Certainty	Low Pressurized injection of a ZVI slurry over a vertical depth of 120 feet of saturated aquifer would result in incomplete distribution of ZVI in the treatment area. The effectiveness of the remedy relies on contact between the ZVI and the contaminant mass. Incomplete distribution of ZVI in the subsurface will result in pockets in the aquifer were contaminant mass can migrate without treatment.

*Cost is for active remediation only and does not include on-going groundwater monitoring

7.5 Monitored Natural Attenuation

7.5.1 Description of the Technology

Natural subsurface processes such as dilution, dispersion, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials will bring about the decrease in COC concentrations over time. Monitoring would verify the effectiveness of the natural attenuation processes and show that remediation of a groundwater aquifer can occur within a reasonable time frame without active treatment. The natural attenuation processes include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume,

or concentration of contamination in groundwater. This technology is only appropriate when the source mass has been removed.

7.5.2 Site Specific Evaluation

MNA is most effective when the source area contaminant mass has been treated. A reduction in source area contaminant mass has been achieved at this Site as a result of the ISCO pilot test, however the pilot test treatment area did not encompass the entire source area and it is likely that some source area contaminant mass remains in place.

A preliminary conceptual design was developed for implementation of MNA at the Site. A summary of the design parameters, the estimate duration of active remediation, and the estimated cost for implementation is provided in the following table.

MNA Conceptual Design Parameters

Design Parameter	Conceptual Design Value
Post Remediation Controls	MNA would be required to treat the downgradient plume, Institutional Controls, including groundwater use restrictions at a minimum, would be implemented to reduce risk
Time Required to Meet Groundwater Standards Throughout the Plume	>10 years
Estimated Cost for Implementation*	$0.5M
Remedy Certainty	Moderate to Low MNA is most effective when the source area contaminant mass has been removed from the site.

*Costs for MNA are limited to annual groundwater monitoring

7.6 No Action

7.6.1 Description of the Technology

Under this alternative, no action would be taken to remediate affected media. Re-assessments would be conducted annually. This practice is commensurate with the CERCLA process.

7.6.2 Site Specific Evaluation

No action, as a remedial alternative, is required by the National Contingency Plan to be carried through the screening process in order to provide a baseline for comparison of the site remedial action alternatives. The no action alternative will not reduce exposure of receptors to the site's contaminants, and will not be effective in reducing contaminant volume, mobility, and toxicity at the Site.

There are no capital costs or ongoing operations and maintenance costs associated with the no action alternative because no response actions are associated with this alternative.

8. SCREENING OF REMEDIAL ALTERNATIVES

8.1 Detailed Screening Process

The second phase of the feasibility study assigns a numerical rating to each of the technologies that were retained for consideration during the preliminary screening process based on the nine EPA criteria for feasibility studies. The nine EPA criteria are listed and described below.

EPA Criteria	Description
Overall Protection of Human Health and the Environment	Each technology was evaluated to determine whether its implementation would achieve adequate protection of human health and the environment. The evaluation focused on how potential risks of exposure to impacted groundwater and surface water will be addressed by each alternative and how the risks will be controlled, reduced, or eliminated through treatment.
Compliance with Applicable or Relevant and Appropriate Requirements	Each alternative was evaluated to determine whether it would meet the ARARs, as identified during the remedial investigation. For the purposes of this FFS, compliance with CERCLA and SCDHEC regulatory requirements are evaluated. ARARs are summarized on Table 6.
Long Term Effectiveness and Permanence	This criterion evaluates the residual risk likely to remain at the Site following the implementation and completion of each alternative. It specifically evaluates the risk posed by treatment residuals and/or untreated wastes that will remain at the Site, taking into account the carcinogenic and non-carcinogenic effects, toxicity, mobility, expected volume, and likely exposure pathways. This factor assesses the adequacy and suitability of controls, if any, that are used to manage treatment residuals or untreated wastes that remain at the conclusion of remediation efforts. It may include an assessment of containment systems and institutional controls to determine if they are sufficient to ensure that any exposure to human and environmental receptors is within protective levels. This factor also addresses the long-term reliability of management controls for providing continued protection from residuals. It includes the assessment of the potential need to replace technical components of the alternative, such as a cap, a slurry wall, or a treatment system; and the potential exposure pathway and the risks posed should the remedial action need replacement.
Reduction of Toxicity, Mobility, or Volume Through Treatment	Remedial alternatives were evaluated to determine the extent to which they will reduce risk through permanently removing the mass of hazardous substances, significantly reducing toxicity through stabilization (reduction in mobility), and/or reduction in the volume of the contaminated media (soil/source area excavation).
Short Term Effectiveness	The short-term effectiveness of each alternative was evaluated to determine the potential impacts to human health and the environment during the construction, implementation, and operation phases. Consideration will be given to protection of workers and the community from hazards caused by the alternative.
Implementability	An evaluation of the technical and administrative feasibility of each alternative was conducted through an analysis of the known limitations of the technology, the ability to monitor the progress of the technology, the availability of required materials, and the amount of agency coordination required for full implementation (permits, easements, etc.).

EPA Criteria	Description
Cost	A comprehensive evaluation of the total cost, including capital expenditures, engineering, licensing, operation and maintenance, and Site rehabilitation associated with each alternative was made to determine which alternative is the most implementable and cost effective.
Community Acceptance	Community acceptance will be evaluated by SC DHEC and, therefore, was not included in the following evaluation.
State Acceptance	State acceptance will be evaluated by SC DHEC and, therefore, was not included in the following evaluation.

The overall rating for the technology was taken as the sum of the ratings for each criteria. Two of the criteria, community acceptance and state acceptance, will be evaluated by SC DHEC and consequently were not included in this evaluation. The remaining seven EPA criteria which receive a rating have a maximum score of 10 per criteria resulting in a maximum score possible for the seven criteria that are evaluated in this document of 70. The rating system for each ranking question is summarized below.

Summary of Ranking System

ALL TERMS EXCEPT COST		COST	
1 =	Very poor relative to other technologies	1 =	Very high relative to other technologies
2 =	Poor relative to other technologies	2 =	High relative to other technologies
3 =	Moderate relative to other technologies	3 =	Moderate relative to other technologies
4 =	Favorable relative to other technologies	4 =	Low relative to other technologies
5 =	Very favorable relative to other technologies	5 =	Very low relative to other technologies

8.2 Remediation Alternatives Analysis

Each of the source area treatment technologies retained as part of the preliminary screening process for consideration were evaluated against the EPA criteria developed for feasibility study analysis. The results are summarized in the following table and a discussion of the ratings is provided below.

EPA Performance Criteria	No Action	ZVI	MNA	Hydraulic Containment	Bioremediation	ISCO
Overall protection of human health and the environment						
The treatment technology protects the Site specific primary exposure pathways	1	2	1	2	2	3
The treatment technology limits or eliminates short term or cross-media impacts	1	3	1	2	3	3
Compliance with Applicable or Relevant and Appropriate Requirements						

EPA Performance Criteria	No Action	ZVI	MNA	Hydraulic Containment	Bioremediation	ISCO
The alternative is capable of meeting the chemical specific ARARs (surface water, groundwater, and air emission standards)	1	3	1	3	3	3
The alternative is capable of meeting the action and location specific ARARs (protection of wetlands, historic preservation act, UIC permit, OSHA)	3	3	3	3	3	3
Long Term Effectiveness and Permanence						
Potential residual risk for untreated contamination	1	2	1	2	2	4
Adequacy and reliability of required controls required following remediation	1	3	1	2	3	3
Reduction of Toxicity, Mobility, or Volume Through Treatment						
Does the treatment technology reduce the toxicity, mobility or volume of the contamination?	1	2	1	2	2	4
Is the treatment technology irreversible?	1	3	1	2	3	3
Short Term Effectiveness						
Will there be significant additional risks to the community, workers, or the environment as a result of implementing this technology?	4	3	4	3	3	3
Time until remedial response objectives are achieved	2	3	2	2	3	4
Implementability						
Ability to construct and operate technology	5	2	5	2	3	3
Availability of vendors and specialists	5	3	5	3	3	3
Cost						
Capital costs	5	2	5	2	3	4
Operation and maintenance costs	5	3	4	2	3	3
TOTAL	**36**	**37**	***35***	**32**	**39**	**46**

Overall Protection of Human Health and the Environment

ISCO received the highest score for protection of site specific exposure pathways because the technology has been successfully pilot tested at the Site and has been shown to result in a sustained decrease of contaminant concentrations. Bioremediation received a moderate score for protecting the primary exposure pathway because, although it is possible for bioremediation to be effectively implemented at the Site, the intrinsic Site conditions are not favorable for bioremediation and no data has been collected to demonstrate that the bioremediation would successfully convert PCE and TCE through cDCE and VC to non-regulated end products (e.g. ethene and/or ethane). ZVI received a moderate score for protecting primary exposure pathways because the delivery method required for implementation of

ZVI at this site, pressurized injection, frequently results incomplete distribution of ZVI and pockets of untreated contaminant mass. Hydraulic containment also received a moderate score for protection of site specific exposure pathways because, although hydraulic containment will limit the migration of the contaminant plume it is unlikely to result in long term decrease in source area contaminant concentration.

ISCO, ZVI, and bioremediation received the same score for limiting short term or cross medial impacts because they all treat contaminant mass in-situ, limiting the potential for cross media impacts. Hydraulic containment received a lower score for limiting short term or cross media impacts because it requires ex-situ transfer of contaminant mass that could result in a release to another media.

No action and MNA received the lowest ranking for overall protection of human health and the environment because contaminant mass is not removed or destroyed and the risk for exposure is not mitigated.

Compliance with Applicable or Relevant and Appropriate Requirements

All of the alternatives listed would require a period of natural attenuation for the groundwater downgradient of the treatment area to reach regulatory limits, and consequently, all of the alternatives received the same score for meeting the chemical specific ARARs, with the exception of No Action and MNA. The No Action and MNA alternative received the lowest score because regulatory limits would not be achieved in any portion of the plume during implementation.

All of the technologies listed would comply with the action and location-specific ARARs and, consequently, all of the alternatives received the same score for that category.

Long Term Effectiveness and Permanence

ISCO received the highest score for long term effectiveness and permanence because the pilot test demonstrated that ISCO will result in a sustained decrease in contaminant concentrations.

ZVI received a moderate score because ZVI delivery through pressurized injection is inconsistent and frequently results in pockets of untreated contaminant mass. Hydraulic containment also received a moderate score because although groundwater extraction removes some contaminant mass, contaminant concentrations frequently rebound following discontinuation of a hydraulic containment system.

Bioremediation received a moderate score for potential residual risk for untreated contaminant because the natural occurring aerobic aquifer would need to be “flipped” to anaerobic conditions for anaerobic bioremediation to successfully implemented. In addition, site specific implementation has not been gathered to demonstrate that bioremediation could be effectively implemented at the Site to convert parent products to non-regulated daughter products. The low score is a reflection of the potential for bioremediation activities to stall at cDCE or VC, resulting in a decrease in the concentration of the parent compounds (PCE and TCE) but an increase in the concentration of regulated daughter products (cDCE and VC).

ISCO, ZVI, and bioremediation received the same score for the adequacy and reliability of required controls following remediation because, once the active remediation period is complete, neither technology requires long term controls. Hydraulic containment received a lower score for adequacy and reliability of required controls it is a long term remediation system that will likely require operation for a period of more than 20 years.

The No Action and MNA alternatives received the lowest score because the source mass is not removed or destroyed and consequently the long-term risks associated with impacts remain.

Reduction of Toxicity, Mobility, or Volume through Treatment

ISCO received the highest score for reduction in toxicity, mobility or volume of contamination because it has been demonstrated to effectively treat contaminant mass at the Site, and because during the oxidation process contaminants are converted to non-regulated by products.

Bioremediation received a lower score because of the potential for incomplete conversion of parent products to non-regulated daughter products (cDCE and VC). ZVI also received a lower score due to the potential for pockets of untreated contaminant mass to remain in the subsurface as a result of non-uniform amendment delivery during pressurized injection.

ISCO, ZVI, and bioremediation received the same score for irreversibility. When effective, the process for mass reduction for all three technologies is irreversible. Hydraulic containment received a lower score because contaminant concentrations frequently rebound or remain constant following system shutdown.

The No Action and MNA alternatives received a lower ranking than the other technologies because contaminant source mass is allowed to remain intact within the subsurface.

Short Term Effectiveness

No Action and MNA received a higher score for short term increase in risk to the community, workers, or the environment because neither technology requires disturbance of the subsurface, handling of chemicals, use of machinery, or construction activities.

ISCO, ZVI, bioremediation, and hydraulic containment received the same moderate score for significant additional risks because none of the technologies result in a short term increase in risk to the community, workers, or the environment as a result of their implementation.

ISCO received the highest score for time until remedial response objectives are achieved because it has the shortest active remediation implementation periods. ZVI and bioremediation received the second highest score for time until remedial response objectives are achieved because the certainty associated with these technologies is lower than that associated with ISCO at this site, and as a result the active remediation periods will be extended for these technologies.

No Action, MNA, and hydraulic containment received the lowest scores for time until remedial response objectives are achieved because none of the technologies result in treatment of the contaminant mass in the source area.

Implementability

ISCO and bioremediation received the same score for implementability because they both require a similar in-situ injection infrastructure, and neither require any specialty subcontractors of vendors to implement. Hydraulic containment received a lower score for implementability because it involves in construction of an above ground treatment system in addition to the subsurface infrastructure. ZVI received a lower score for implementability because it would require specialized injection equipment to open the pore space in the subsurface to accept the injection slurry and frequently results in amendment surfacing.

The No Action and MNA alternatives received the highest rating for each category because implementation of the No Action and MNA alternatives do not require any construction activity of use of vendors or subcontractors.

Cost

The cost criterion includes estimated initial capital costs and annual operation and maintenance costs. Cost estimates are expected to be accurate within a range of -30% to +50%. Estimates were calculated for the expected minimum and maximum number of years of operation and maintenance. Assumptions for the remedial technology cost estimates are presented in Appendix B.

ISCO received the highest score for cost because it is the lowest cost alternative. Bioremediation received the second highest score for cost because although similar in-situ injection infrastructure is required for ISCO and bioremediation, bioremediation is expected to require more injection events to than ISCO and is consequently more expensive to implement than ISCO.

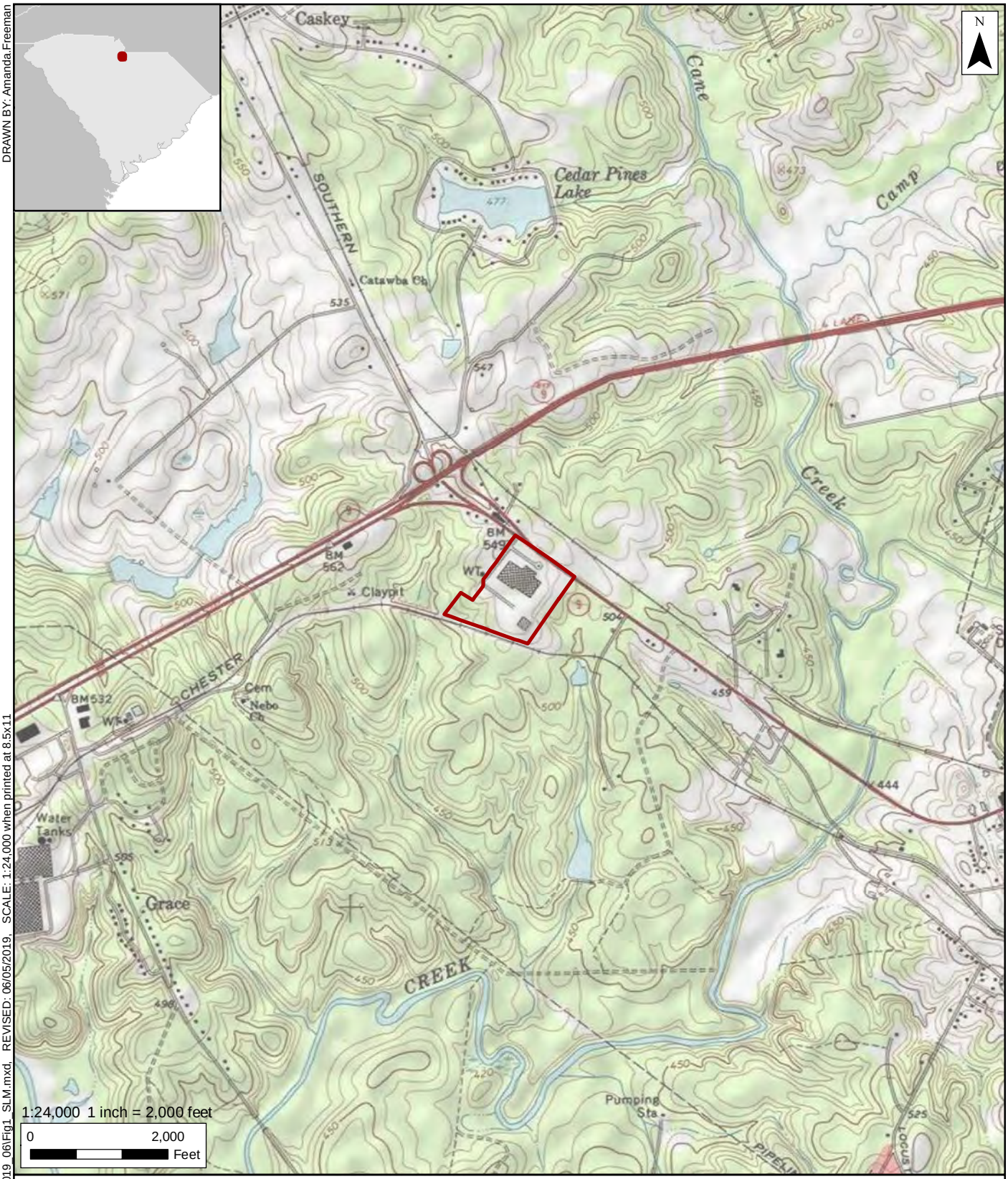
Hydraulic containment received a lower score for cost because it requires a measurable capital expenditure to design and construct the system, and also requires monthly operation and maintenance during system operation. ZVI also received a lower score for capital cost due to the smaller radius of influence associated with ZVI injection points when compared to ISCO or bioremediation and the equipment required for installation. However, ZVI received a moderate score for operation and maintenance because operation and maintenance is limited to repeat injections to improve technology performance.

The No Action alternative does not require any capital or O&M expenditure and consequently received the highest cost rating. MNA received the second highest score for cost because the only cost incurred during the implementation of MNA is for routine groundwater monitoring.

8.3 Conclusions

Based on the results of the feasibility study, ISCO received the highest rating when compared to the EPA criteria.

FIGURES



DRAWN BY: Amanda.Freeman

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Legend

Site

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Figure 1

Site Location Map

Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster, Lancaster County, SC

Source: Copyright:© 2013 National Geographic Society, i-cubed

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet

DRAWN BY: Amanda.Freeman

SCALE: 1:3,000 when printed at 11x17

REVISED: 06/07/2019

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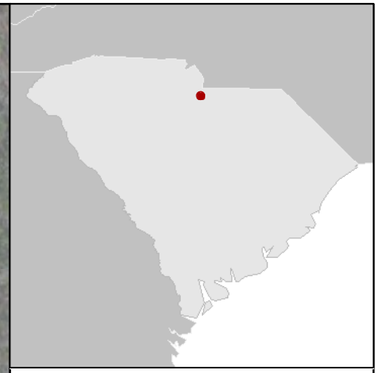


Legend

- Site
- Parcels
- Former Off-Site Lagoons
- Shallow Monitor Well
- Intermediate Monitor Well
- Deep Monitor Well
- Bedrock Monitor Well
- Observation Well
- Injection Well

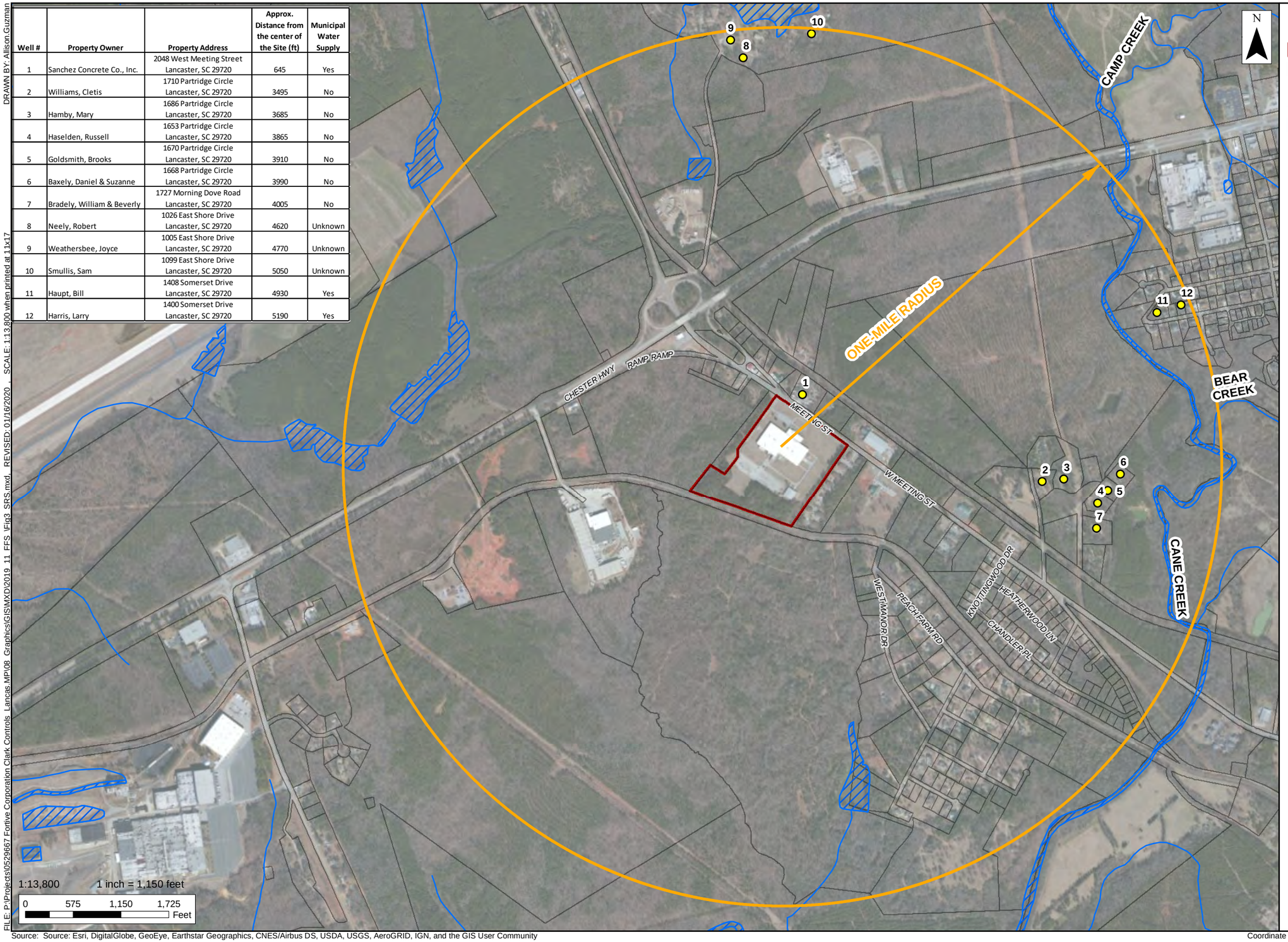
Figure 2
Site Map
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

Environmental Resources Management
www.erm.com

Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet

Well #	Property Owner	Property Address	Approx. Distance from the center of the Site (ft)	Municipal Water Supply
1	Sanchez Concrete Co., Inc.	2048 West Meeting Street Lancaster, SC 29720	645	Yes
2	Williams, Cletis	1710 Partridge Circle Lancaster, SC 29720	3495	No
3	Hamby, Mary	1686 Partridge Circle Lancaster, SC 29720	3685	No
4	Haselden, Russell	1653 Partridge Circle Lancaster, SC 29720	3865	No
5	Goldsmith, Brooks	1670 Partridge Circle Lancaster, SC 29720	3910	No
6	Baxely, Daniel & Suzanne	1668 Partridge Circle Lancaster, SC 29720	3990	No
7	Bradely, William & Beverly	1727 Morning Dove Road Lancaster, SC 29720	4005	No
8	Neely, Robert	1026 East Shore Drive Lancaster, SC 29720	4620	Unknown
9	Weathersbee, Joyce	1005 East Shore Drive Lancaster, SC 29720	4770	Unknown
10	Smullis, Sam	1099 East Shore Drive Lancaster, SC 29720	5050	Unknown
11	Haupt, Bill	1408 Somerset Drive Lancaster, SC 29720	4930	Yes
12	Harris, Larry	1400 Somerset Drive Lancaster, SC 29720	5190	Yes



Site
Parcels
Water Supply Well
Surface Water Body (Stream)
Surface Water Body (Lake)

Note: Properties listes as "Unknown" contain a readily obervable well; however, it could not be determined if the properties are also supplied with a a municipal source. Property pwners have not responded to inquires.

Figure 3
Site Receptor Survey Map
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

Environmental Resources Management
www.erm.com

Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet

DRAWN BY: Allison.Guzman
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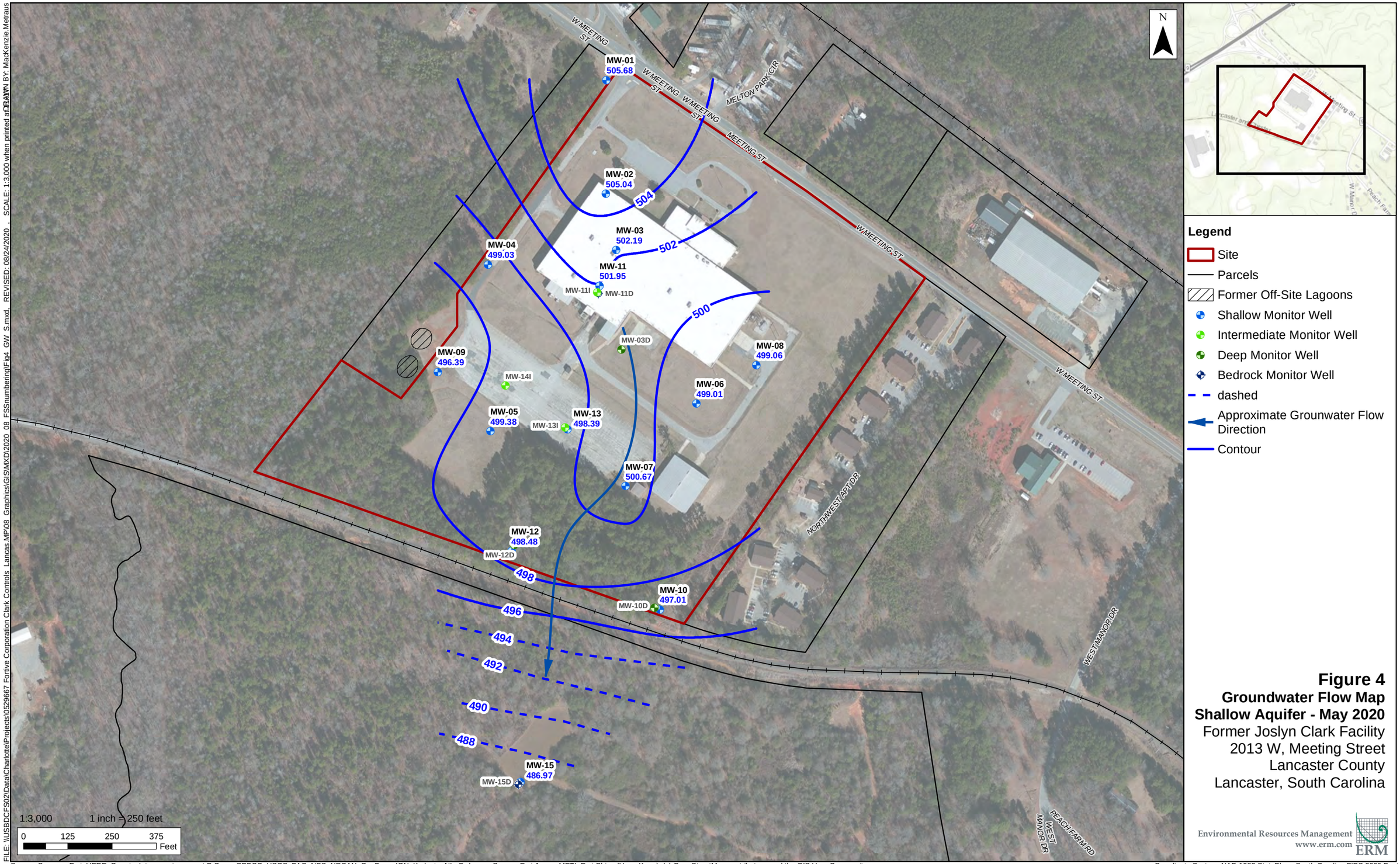


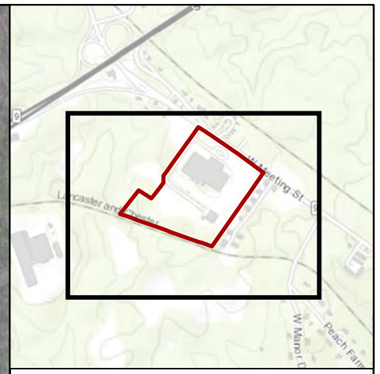
Figure 4
Groundwater Flow Map
Shallow Aquifer - May 2020
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

Environmental Resources Management
www.erm.com

FILE: \\USBDCFS02\Data\CharlotteProjects\0529667 Fortive Corporation Clark Controls Lancas MP\08 Graphics\GIS\MXD\2020_08 FSSnumberingUpd GW S.mxd, REVISED: 08/24/2020 , SCALE: 1:3,000 when printed at 24 x 36 DRAWN BY: MacKenzie.Metraus

Source: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet



Legend

- Site
- Parcels
- Former Off-Site Lagoons
- Shallow Monitor Well
- Intermediate Monitor Well
- Deep Monitor Well
- Bedrock Monitor Well
- Predicted Groundwater Contour
- Approximate Grounwater Flow Direction
- Groundwater Contour

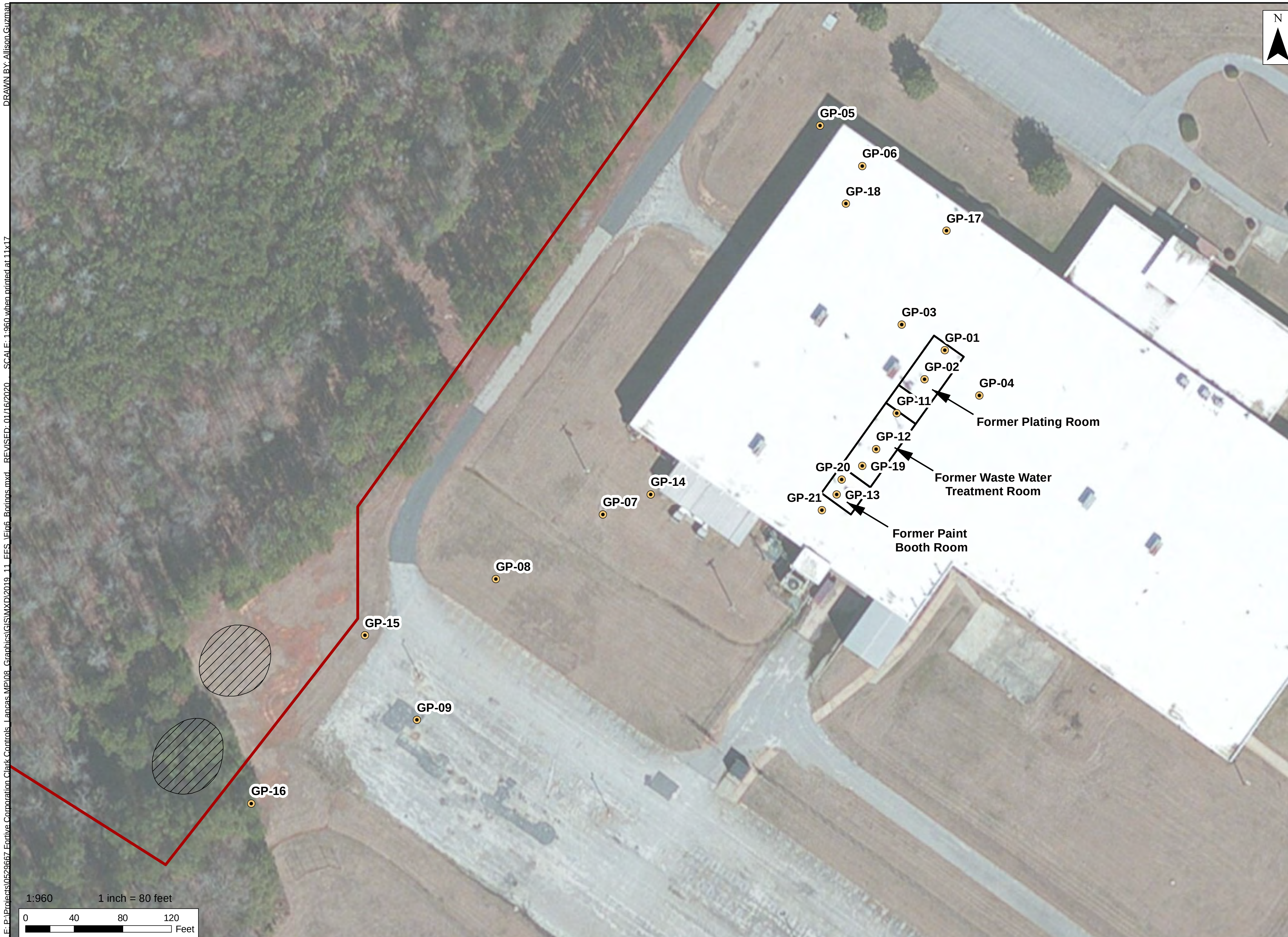
Figure 5
Groundwater Flow Map
Deep Aquifer - May 2020
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

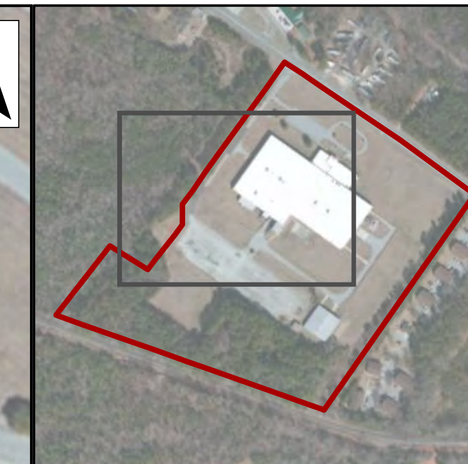
Environmental Resources Management
www.erm.com

FILE: \\USBDCFS02\Data\Charlotte\Projects\0529667 Fortive Corporation Clark Controls Lancas.MP\08 Graphics\GIS\MXD\2020_08 FSSnumberingTip5 GW_D.mxd, REVISED: 09/11/2020 , SCALE: 1:3,000 when printed at 22 X 17 DRAWN BY: MacKenzie.Metraus

Source: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet





Legend

- Site
- Former Off-Site Lagoons
- Soil Boring Location

Figure 6
Soil Boring Locations Map
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

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Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet

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Legend

- Site
- Parcels
- Former Off-Site Lagoons
- Shallow Monitor Well
- Intermediate Monitor Well
- Deep Monitor Well
- Bedrock Monitor Well

TCE Isoconcentration Contours

- > 100 ug/L
- 50 - 100 ug/L
- 5 - 50 ug/L

Notes
TCE - Trichloroethene
ug/L - micrograms per liter

Figure 7
TCE Isoconcentration Map
Shallow Aquifer - May 2020

Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

Environmental Resources Management
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Source: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet

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Legend

- Site
- Parcels
- Former Off-Site Lagoons
- Shallow Monitor Well
- Intermediate Monitor Well
- Deep Monitor Well
- Bedrock Monitor Well

TCE Isoconcentration Contours

- > 100 ug/L
- 50 - 100 ug/L
- 5 - 50 ug/L

Notes
TCE - Trichloroethene
ug/L - micrograms per liter

Figure 8
TCE Isoconcentration Map Deep Aquifer - May 2020

Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

Environmental Resources Management
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FILE: \\USBDCFS02\Data\Charlotte\Projects\0529667 Fortive Corporation Clark Controls Lancas.MP\08 Graphics\GIS\MXD\2020 06 FSSnumberingVFig8 TCE D.mxd, REVISED: 09/11/2020 , SCALE: 1:3,000 when printed at 22"x34" DRAWN BY: MacKenzie.Metraus

Source: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet

Legend

- Site
- Parcels
- Former Off-Site Lagoons
- Shallow Monitor Well
- Intermediate Monitor Well
- Deep Monitor Well
- Bedrock Monitor Well
- Cross Section Transects

Figure 9

Cross Section Transect Map

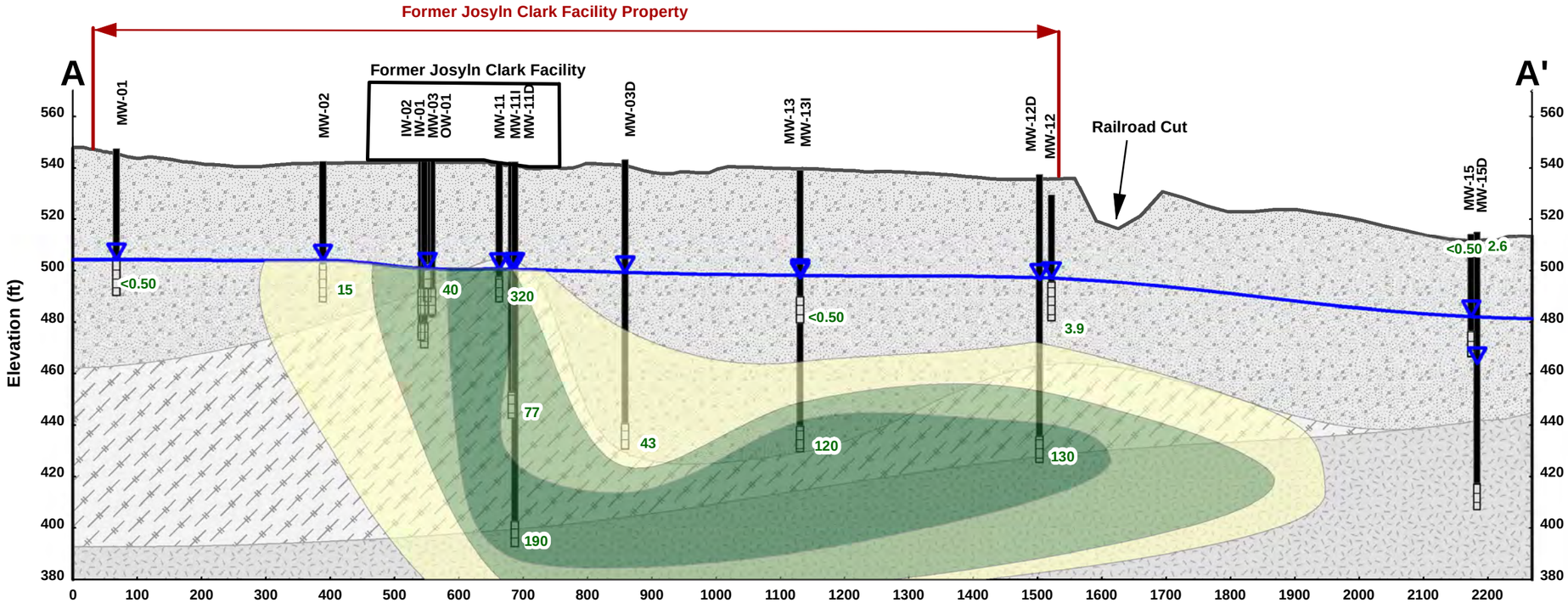
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

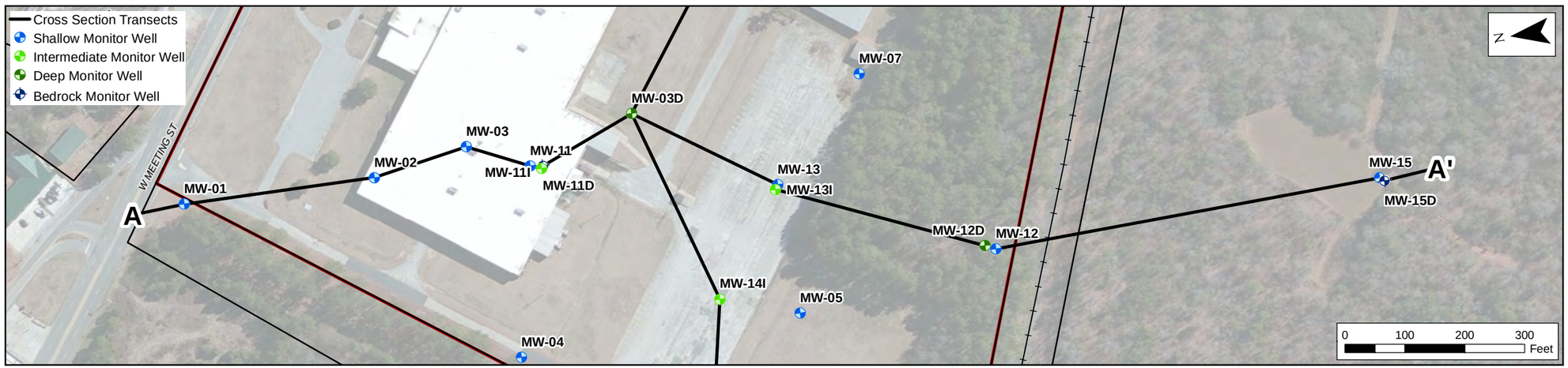
Environmental Resources Management
www.erm.com

Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet

Notes:
Vertical Exaggeration = 4:1
1 inch = 200 feet





Approximate Water Level

Well Details
- Casing
- Screen

Lithology
- Saprolite
- Partially Weathered Rock
- Bedrock

TCE Isoconcentration Contour
- > 100 ug/L
- 50 - 100 ug/L
- 5 - 50 ug/L

Notes
745 - TCE Concentration (May 2020)
TCE - Trichloroethene
ug/L - micrograms per liter

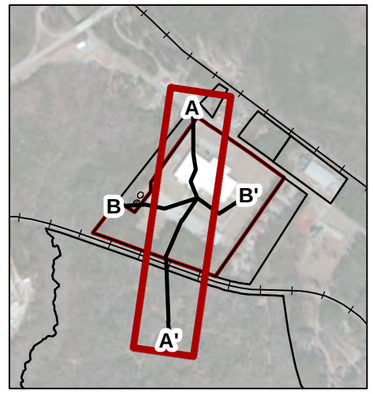


Figure 10
Cross Section A-A'
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

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Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet

DRAWN BY: MacKenzie.Metraus

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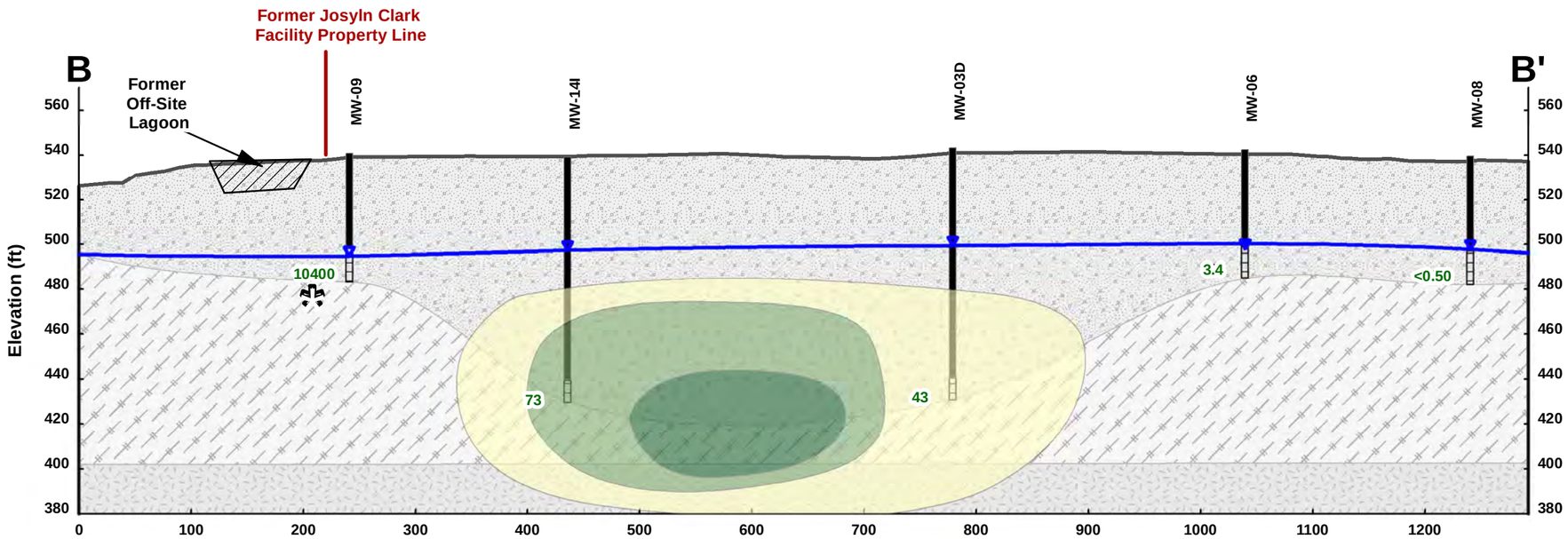
Notes:
Vertical Exaggeration = 2:1
1 inch = 120 feet



Approximate Water Level

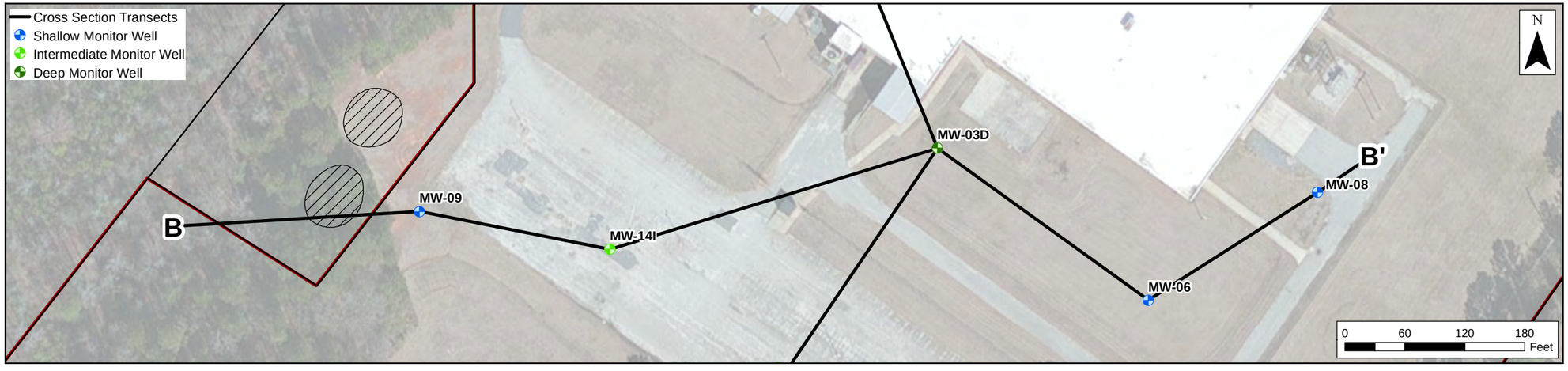
Well Details
- Casing
- Screen

Lithology
- Saprolite
- Partially Weathered Rock
- Bedrock

TCE Isoconcentration Contour
- > 100 ug/L
- 50 - 100 ug/L
- 5 - 50 ug/L

Notes
72.8 - TCE Concentration (May 2020)
TCE - Trichloroethene
ug/L - micrograms per liter

- VOCs in MW-09 are associated with off-site former lagoons. TCE data from November 2019.



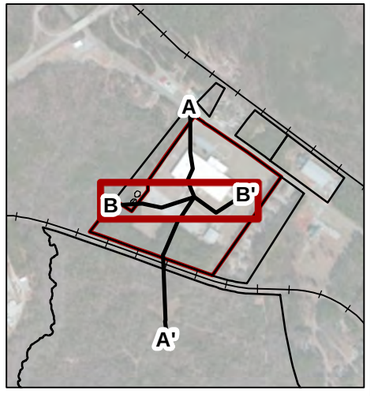


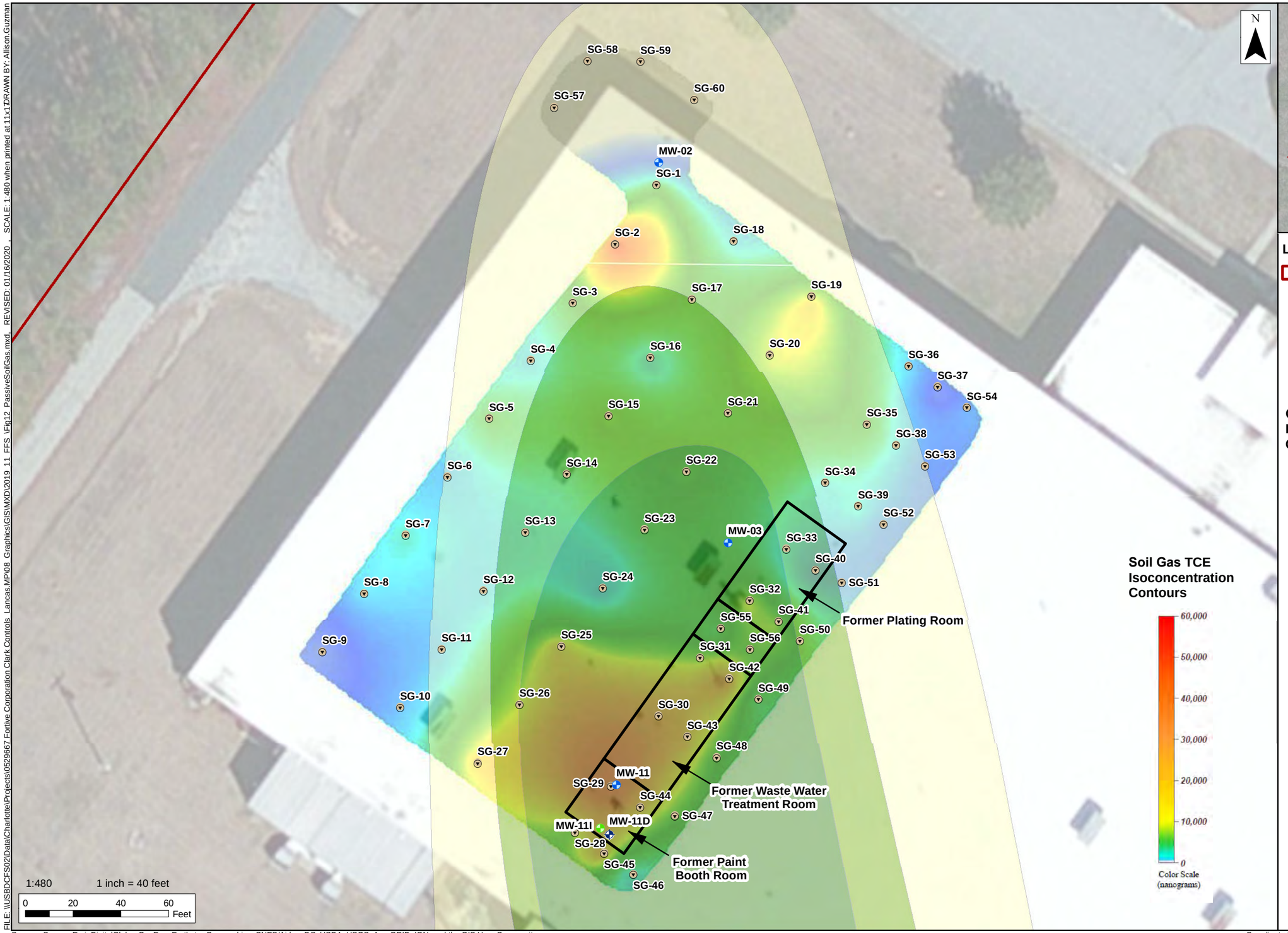
Figure 11
Cross Section B-B'
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

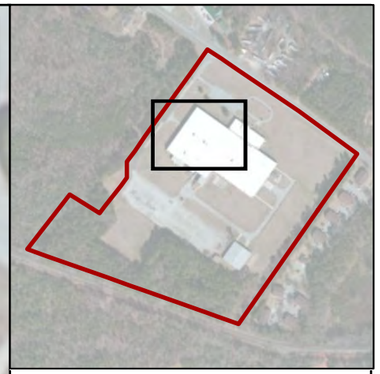
Environmental Resources Management
www.erm.com

Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet

FILE: \\USBDCFS02\Data\Charlotte\Projects\0529667 Fortive Corporation Clark Controls Lancas.MP\08 Graphics\GIS\MXD\2019 11 FFS \Fig12 PassiveSoilGas.mxd REVISED: 01/16/2020 , SCALE: 1:480 when printed at 11x17 DRAWN BY: Allison.Guzman





Legend

- Site
- Bedrock Monitor Well
- Intermediate Monitor Well
- Shallow Monitor Well
- Passive Soil-Gas Sample Location

Groundwater TCE Isoconcentration Contours

- > 100 ug/L
- 5 - 50 ug/L
- 50 - 100 ug/L

Soil Gas TCE Isoconcentration Contours

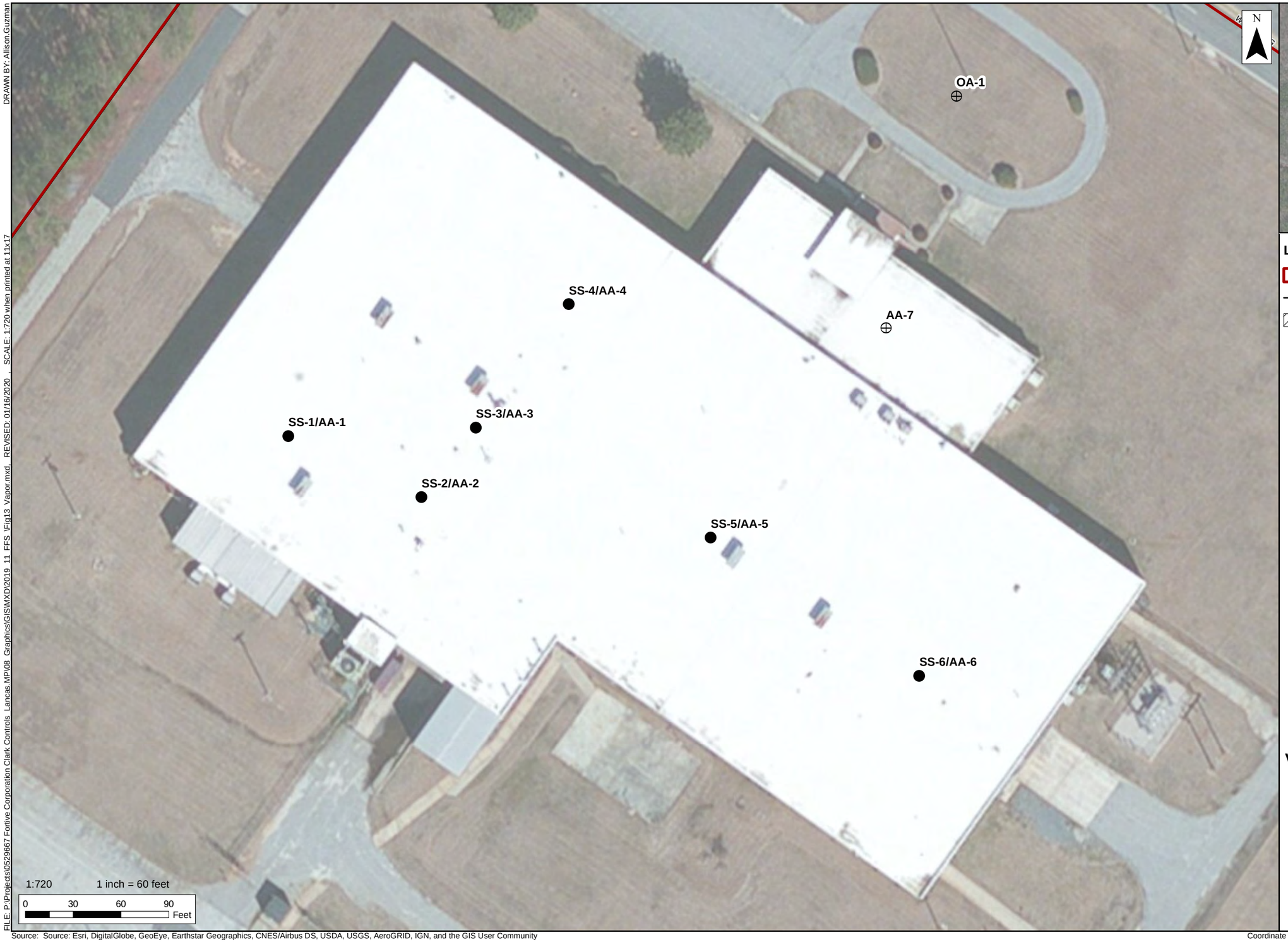
Figure 12

Passive Soil Gas Survey
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

Environmental Resources Management
www.erm.com

Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet



Legend

- Site
- Parcels
- Former Off-Site Lagoons
- Air Sample Only
- Co-Located Soil Gas & Indoor Air Sample

Figure 13
Vapor Intrusion Assessment
Sample Location Map
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

Environmental Resources Management
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ERM

Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet

DRAWN BY: Allison.Guzman

SCALE: 1:720 when printed at 11x17

REVISED: 01/16/2020

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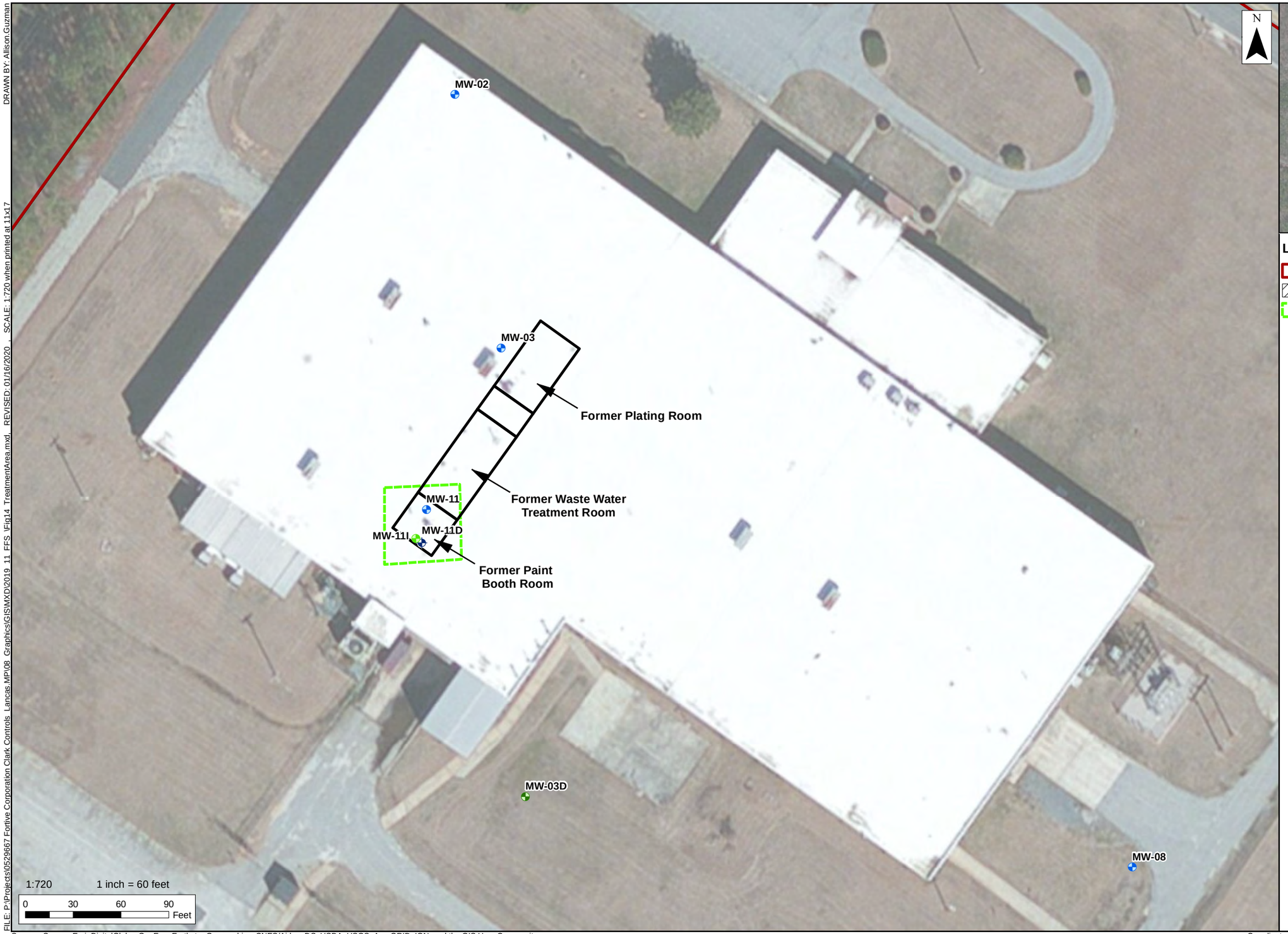

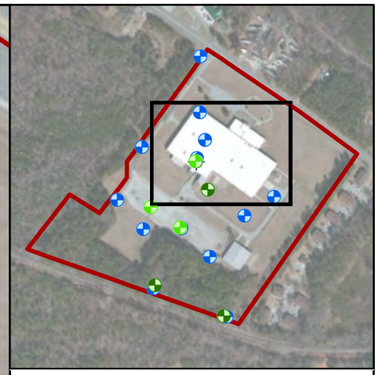

Legend

- Site
- Former Off-Site Lagoons
- Treatment Area
- Shallow Monitor Well
- Intermediate Monitor Well
- Deep Monitor Well
- Bedrock Monitor Well

Figure 14
Source Area Treatment Map
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster County
Lancaster, South Carolina

Environmental Resources Management
www.erm.com

Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet

TABLES

TABLE 1
SOIL ANALYTICAL RESULTS - 2009 VOCs, SVOCs, AND METALS
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

					VOCs by EPA Method 8260B (mg/kg)				SVOCs by EPA Method 8270C (mg/kg)	Metals by EPA 6010C (mg/kg)										
Sample ID	**Date**	**Potential Source Area**	**Total Depth of Boring (ft)**	**Sample Collection Depth (ft)**	cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene	Total Xylenes	All Compounds	Arsenic	Antimony	Beryllium	Cadmium	Chromium (Total)	Copper	Lead	Nickel	Silver	Thallium	Zinc
GP-1	4/7/2009	Plating Area	39	0-4	ND	ND	ND	ND	ND	ND	0.62	0.43	0.28	76	120	7.2	ND	8.8	ND	200
				16-20	0.086	ND	ND	ND	ND	ND	ND	0.60	0.33	1.1	3.6	3.0	ND	ND	ND	36
				35-39	ND	ND	ND	ND	ND	ND	ND	1.3	0.36	6.7	19	2.0	ND	0.48	ND	35
GP-2	4/7/2009	Plating Area	35	0-4	ND	ND	ND	ND	ND	ND	ND	0.64	0.97	49	24	4.3	2.4	0.96	ND	170
				16-20	ND	ND	ND	0.0074	ND	0.95	ND	0.76	0.33	160	16	1.1	4.3	3.2	ND	21
				32-35	ND	ND	ND	ND	ND	ND	ND	1.0	0.47	14	3.6	2.8	4.5	0.34	ND	27
GP-3	4/7/2009	Plating Area	40	4-8	ND	ND	ND	ND	ND	ND	ND	0.88	0.23	1.4	0.7	7.0	ND	ND	ND	27
				12-16	ND	ND	ND	ND	ND	ND	ND	0.79	0.29	1.6	ND	6.0	ND	ND	ND	22
				36-40	ND	ND	**0.043**	ND	ND	0.72	ND	1.6	0.43	0.65	ND	24	ND	ND	ND	34
GP-4	4/8/2009	Plating Area	40	8-10	ND	ND	ND	ND	ND	ND	ND	0.37	0.11	33	2.8	2.8	ND	0.6	ND	13
				24-26	ND	ND	ND	ND	ND	0.65	ND	0.39	ND	1.6	0.58	0.71	ND	ND	ND	10
				38-40	ND	ND	ND	ND	ND	0.78	ND	0.86	0.15	3.0	2.4	2.2	ND	ND	ND	18
GP-5	4/7/2009	TCE AST Area	40	0-4	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
				24-28	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
				36-40	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-6	4/8/2009	TCE AST Area	40	4-5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
				14-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
				36-38	ND	ND	**0.017**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EPA Screening Level - Protection of Groundwater - Risk Based					0.11	0.000052	0.00061	0.23	Varies	0.0013	0.66	58	1	NE	51	NE	48	1.6	0.17	680
EPA Screening Level - Residential					780	0.57	2.8	600	Varies	0.39	31	160	70	280	3,100	400	1,600	390	5.1	23,000
EPA Screening Level - Industrial					10,000	2.7	14	2600	Varies	1.6	410	2,000	810	1400	41,000	800	20,000	5,100	66	310,000

TABLE 1
SOIL ANALYTICAL RESULTS - 2009 VOCs, SVOCs, AND METALS
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

					VOCs by EPA Method 8260B (mg/kg)				SVOCs by EPA Method 8270C (mg/kg)	Metals by EPA 6010C (mg/kg)										
Sample ID	**Date**	**Potential Source Area**	**Total Depth of Boring (ft)**	**Sample Collection Depth (ft)**	cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene	Total Xylenes	All Compounds	Arsenic	Antimony	Beryllium	Cadmium	Chromium (Total)	Copper	Lead	Nickel	Silver	Thallium	Zinc
GP-7	4/8/2009	Wastewater Discharge Line	8	6-8	ND	ND	ND	ND	ND	ND	ND	0.59	0.5	4.4	3.7	8.8	5.2	0.53	ND	19
GP-8	4/8/2009	Wastewater Discharge Line	8	6-8	ND	ND	ND	ND	ND	1.2	ND	1.5	ND	110	56	36	39	3.4	ND	30
GP-10	4/8/2009	Hazardous Waste Storage Area	12	6-8	ND	ND	**0.0067**	ND	ND	1.6	ND	0.39	ND	16	17	16	4.1	1.1	ND	21
GP-11	4/8/2009	Plating / Wastewater Treatment Area	40	4-6	ND	ND	ND	0.097	ND	0.71	ND	0.95	0.47	28	11	15	11	0.4	3.3	29
				18-20	ND	ND	ND	ND	ND	ND	ND	0.66	0.14	6	3.3	6.3	2.2	ND	ND	29
				38-40	ND	ND	ND	ND	ND	ND	ND	0.69	ND	7.2	1.7	2.8	ND	ND	ND	19
GP-12	4/8/2009	Wastewater Treatment Area	37	8-10	ND	ND	ND	ND	ND	ND	ND	0.40	0.12	0.79	1.7	3.6	ND	0.28	ND	12
				24-26	ND	ND	ND	ND	ND	ND	ND	0.58	ND	4.3	0.58	1.3	ND	ND	ND	18
				35-37	ND	ND	ND	ND	ND	ND	ND	0.66	0.15	1.2	0.6	0.78	ND	0.29	ND	16
GP-13	4/8/2009	Paint Booth	38	8-10	ND	ND	ND	ND	ND	ND	ND	0.49	0.11	1	1.2	3.7	ND	ND	ND	21
				24-26	ND	ND	ND	ND	ND	0.67	ND	0.75	0.17	2.6	1.2	1.2	ND	ND	ND	18
				36-38	ND	ND	ND	ND	ND	ND	ND	0.78	0.22	0.45	ND	1.2	ND	ND	ND	11
BG-1	4/7/2009	Background	4	0-4	NA	NA	NA	NA	NA	4.5	ND	0.44	ND	13	8.1	13	4.4	1.2	ND	18
BG-2	4/7/2009	Background	4	0-4	NA	NA	NA	NA	NA	0.84	ND	0.54	0.19	0.8	7.5	3.9	2.6	0.39	ND	29
EPA Screening Level - Protection of Groundwater - Risk Based					0.11	0.000052	0.00061	0.23	Varies	0.0013	0.66	58	1.4	NE	51	NE	48	1.6	0.17	680
EPA Screening Level - Residential					780	0.57	2.8	600	Varies	0.39	31	160	70	280	3,100	400	1,600	390	5.1	23,000
EPA Screening Level - Industrial					10,000	2.7	14	2,600	Varies	1.6	410	2,000	810	1400	41,000	800	20,000	5,100	66	310,000

Notes:
mg/kg = Milograms/kilogram, or ppm
ND = Not Detected; NA=Not analyzed; NE = Not Established; N/A = Not applicable
BOLD values indicate an exceedance of a published regulatory threshold
EPA Screening Level - Regional Screening Levels for Chemical Contaminants at Superfund Sites, September 12, 2008

TABLE 2A
SOIL ANALYTICAL RESULTS - 2011 VOCs and PAHs
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

					Volatile Organic Compounds by EPA Method 8260B (mg/kg)						PAHs by EPA Method 8270D (mg/kg)
Sample ID	**Date**	**Potential Source Area**	**Total Depth of Boring (ft)**	**Sample Collection Depth (ft)**	Chloroform	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene	1,1,2-Trichloroethane	Various Compounds
GP-14	10/10/2011	Wastewater Discharge Line	8	6-8	ND	ND	ND	ND	ND	ND	ND
GP-15	10/10/2011	Wastewater Discharge Line	8	6-8	ND	ND	ND	ND	ND	ND	NA
GP-16	10/10/2011	Wastewater Lagoon Area	40	10-12	ND	ND	ND	ND	**0.0038 J**	ND	ND
				26-28	**0.002 J**	ND	0.01	**0.025**	**0.290**	**0.0019 J**	ND
				26-28 (Dup-1)	ND	ND	ND	**0.82 J**	ND	ND	ND
				38-40	**0.0058 J**	0.0078	**0.037**	**0.120**	**2.0**	**0.0045 J**	ND
EPA Screening Level - Protection of Groundwater - Risk Based					0.000053	0.12	0.0021	0.000049	0.00072	0.000078	Varies
EPA Screening Level - Residential					0.29	240	160	0.55	2.8	1.1	Varies
EPA Screening Level - Industrial					1.5	1,100	2,000	2.6	14	5.3	Varies

Notes:
BOLD values indicate an exceedance of a published regulatory threshold
EPA Screening Level - Regional Screening Levels for Chemical Contaminants at Superfund Sites, June 2011
mg/kg = Milograms/kilogram, or ppm
ND = Not Detected; NA=Not analyzed; NE = Not Established; N/A = Not applicable
PAHs = Polycyclic Aromatic Hydrocarbons
J = Estimated concentration between minimum detection limit and minimum reporting limit
B = Compound detected in method blank
** Protection of Groundwater - Maxium Contaminant Limit

TABLE 2B
SOIL ANALYTICAL RESULTS - 2011 METALS
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

Sample ID	Date	Potential Source Area	Total Depth of Boring (ft)	Sample Collection Depth (ft)	Metals by EPA Method 6010C (mg/kg)																			EPA Method 7471B (mg/kg)
					Aluminum	Antimony	Arsenic	Barium	Beryllium	Calcium	Chromium (total)	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Selenium	Sodium	Silver	Thallium	Vanadium	Zinc	Mercury
GP-14	10/10/2011	Wastewater Discharge Line	8	6-8	10,000	ND	ND	9.5	0.30	ND	1.7	**1.5 J**	3.2	**22,000**	4.3 B	440	39	3.2	420	ND	29 BJ	ND	ND	30	9.9	ND
GP-15	10/10/2011	Wastewater Discharge Line	8	6-8	17,000	ND	**0.84 J**	13	1.3	ND	2.7	**1.3 J**	9.6	**35,000**	8.1 B	310 J	53	2.2 J	240 J	ND	ND	0.15 J	ND	98	21	ND
GP-16	10/10/2011	Wastewater Lagoon Area	40	10-12	11,000	ND	**0.65 J**	14	0.31	ND	0.9	**1.2 J**	4.2	**33,000**	9.7 B	570	**140**	1.0 J	500	ND	ND	0.072 J	ND	46	19	ND
				26-28	34,000	2.5 BJ	ND	100	0.72 J	ND	ND	**16**	1.5 J	**25,000**	5.7 BJ	3,000	**820**	3.8 J	2,600 J	ND	ND	ND	ND	32	47	ND
				26-28 (Dup-1)	27,000	4.3 BJ	**2.6 J**	150	0.81 J	ND	ND	**55**	1.3 J	**28,000**	**15 B**	2,700 J	**1,800**	2.7 J	2,900 J	**4.2 J**	ND	ND	**7.6 J**	34	54	ND
				38-40	26,000	ND	**4.2 J**	230	1.5 J	720 BJ	ND	**20**	5.2	**31,000**	**15 B**	4,100	**2,500**	7.4 J	2,700 J	ND	ND	ND	ND	38	82	0.037 J
EPA Screening Level - Protection of Groundwater - Risk Based					55,000	0.66	0.0013	300	58	NE	NE	0.49	51	640	14**	NE	57	48	NE	0.95	100	1.6	0.026	180	680	0.033
EPA Screening Level - Residential					77,000	31	0.39	15,000	160	NE	280	23	3,100	55,000	400	NE	1,800	1,600	NE	390	NE	390	0.78	390	23,000	10
EPA Screening Level - Industrial					990,000	410	1.6	190,000	2,000	NE	1,400	300	41,000	72,000	800	NE	23,000	20,000	NE	5,100	NE	5,100	10	5,200	310,000	43

Notes:
BOLD values indicate an exceedance of a published regulatory threshold
EPA Screening Level - Regional Screening Levels for Chemical Contaminants at Superfund Sites, June 2011
mg/kg = Milograms/kilogram, or ppm
ND = Not Detected; NA=Not analyzed; NE = Not Established; N/A = Not applicable
J = Estimated concentration between minimum detection limit and minimum reporting limit
B = Compound detected in method blank
** Protection of Groundwater - Maxium Contaminant Limit

TABLE 2C
SOIL ANALYTICAL RESULTS - 2013 VOCs, SVOCs, AND METALS
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

					VOCs by EPA Method 8260B (mg/kg)	1,4-Dioxane by EPA Method 8270D (mg/kg)	Metals by EPA Method 6010C (mg/kg)				
Sample ID	**Date**	**Total Depth of Boring (ft)**	**ColorTech Reading (ppm)**	**Sample Collection Depth (ft)**	Acetone	1,4-Dioxane	Chromium (total)	Copper	Lead	Zinc	Mercury
GP-17	4/8/2013	20	0	3-5	0.00131	**0.404**	0.77	ND	14.0	**51.5**	ND
			0	13-15	ND	**0.481**	ND	ND	5.02	**46.2**	ND
GP-18	4/8/2013	20	0	3-5	ND	**0.776**	ND	**3.66**	6.51	21.1	0.031
			0	13-15	0.00763	**0.578**	ND	ND	1.59	**50.2**	ND
GP-19	4/8/2013	20	0.1	3-5	ND	**0.623**	1.19	ND	4.20	5.25	ND
			0.1	13-15	ND	**0.916**	ND	ND	4.30	5.18	ND
GP-20	4/8/2013	20	0.1	3-5	0.00156	**0.970**	1.04	ND	4.27	16.8	ND
			0.1	13-15	0.0028	**0.821**	1.22	ND	1.75	10.9	ND
GP-21	4/8/2013	20	0	3-5	0.00329	**0.992**	2.54	2.05	6.26	10.5	ND
			0.1	13-15	ND	**0.723**	ND	ND	**66.6**	11.1	ND
EPA Screening Level - Protection of Groundwater - Risk Based					0.24	0.00014	NE	2.2	NE	29	0.0033
EPA Screening Level - Protection of Groundwater - MCL Based					NE	NE	180,000	46	14	NE	0.1
EPA Screening Level - Residential					6,100	4.9	12,000 *	310	400	2,300	1
EPA Screening Level - Industrial					63,000	17	150,000 *	4,100	800	31,000	4

Notes:
BOLD values indicate an exceedance of a published regulatory threshold
EPA Region 9 Screening Level - Regional Screening Levels for Chemical Contaminants at Superfund Sites, May 2013
mg/kg = Milligrams/kilogram, or ppm; * = Screening level for chromium III (none published for total chromium)
MCL= Maximum Contaminant Limit; ND = Not Detected; NE = Not Established

TABLE 3
HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOCs
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

		Volatile Organic Compounds by EPA Method 8260 (µg/L)														
Sample ID	Sample Date	Acetone	2-Butanone (MEK)	Bromodichloromethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	1,1,2-Trichloroethane	Trichloroethene	Dibromochloromethane	Ethylbenzene	Xylene (total)
Regional Screening Level - Tapwater		14000	5600	0.13	0.22	2.7	280	0.17	36	11.4	11	0.28	0.49	0.17	1.5	190
MCL		NE	NE	80	80	NE	7	5	70	5	5	5	5	80	700	10,000
MW-1	5/3/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2015	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/28/2018	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/23/2019	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-2	5/2/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**34.5**	<1.0	<1.0	<1.0
	10/2/2014	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**29.7**	<1.00	0.448J	4.21
	12/29/2014	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**24.5**	<1.00	<1.00	<1.00
	4/2/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.53	<1.00	<1.00	**28.1**	<1.00	<1.00	<1.00
	7/7/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**27.6**	<1.00	<1.00	<1.00
	11/24/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**23.3**	<1.00	<1.00	<1.00
	2/25/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**23.5**	<1.00	<1.00	<1.00
	5/31/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**22.6**	<1.00	<1.00	<1.00
	9/1/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**19.8**	<1.00	<1.00	<1.00
	12/6/2016	1.51	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**25.6**	<1.00	<1.00	<1.00
	3/1/2018	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**19.4**	<1.00	<1.00	<1.00
	4/26/2019	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**20.3**	<1.00	<1.00	<1.00
MW-3	5/2/2013	<20	<20	<20	<20	<20	**22.4**	<20	<20	<20	**54**	<20	**3,120**	<20	<20	<20
	10/2/2014	56.5	4.56	<1.00	1.73	9.05	<1.00	0.358J	<1.00	<1.00	0.533J	1.54	**7.25**	<1.00	<1.00	<1.00
	12/29/2014	51.5	3.63	<1.00	1.8	9.08	<1.00	<1.00	<1.00	<1.00	<1.00	1.9	3.51	<1.00	<1.00	<1.00
	4/2/2015	35.2	1.2	<1.00	1.29	6.79	<1.00	<1.00	<1.00	2.3	<1.00	1.02	2.25	<1.00	<1.00	<1.00
	7/8/2015	15.2	<1.00	<1.00	1.16	5.79	<1.00	0.381J	<1.00	<1.00	0.504J	1.08	**13.9**	<1.00	<1.00	0.418J
	11/24/2015	19.4	<1.00	<1.00	1.49	7.24	<1.00	<1.00	<1.00	<1.00	<1.00	1.51	<1.00	<1.00	<1.00	<1.00
	2/25/2016	12.6	<1.00	<1.00	1.14	5.78	<1.00	<1.00	<1.00	<1.00	<1.00	1.09	<1.00	<1.00	<1.00	<1.00
	5/31/2016	<1.00	<1.00	<1.00	<1.00	4.45	<1.00	<1.00	<1.00	<1.00	1.20	<1.00	<1.00	<1.00	<1.00	<1.00
	9/1/2016	<1.00	<1.00	<1.00	<1.00	4.10	<1.00	<1.00	<1.00	<1.00	1.26	<1.00	1.60	<1.00	<1.00	<1.00
	12/6/2016	4.28	<1.00	<1.00	<1.00	4.09	<1.00	<1.00	<1.00	<1.00	1.22	<1.00	**24.2**	<1.00	<1.00	<1.00
	3/1/2018	<1.00	<1.00	<1.00	<1.00	17.6	<1.00	<1.00	<1.00	<1.00	**18.9**	**6.44**	**753**	<1.00	<1.00	<1.00
	4/26/2019	<5.00	<5.00	<5.00	<5.00	4.27	<5.00	<5.00	<5.00	<5.00	**6.30**	<5.00	**254**	<5.00	<5.00	<5.00

Notes:

BOLD values indicate an exceedence of EPA MCLs, November 2018
ug/l = Micrograms/liter; All analytical results expressed in ug/L
B = Detected in Method blank
J = Less than practical quantification level but equal to or greater than minimum detection limit
EPA = Environmental Protection Agency
MCL = Maximum Contaminant Level
ND = Not Detected; NA=Not analyzed; NE = Not Established; N/A = Not applicable

TABLE 3
HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOCs
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

		Volatile Organic Compounds by EPA Method 8260 (µg/L)														
Sample ID	Sample Date	Acetone	2-Butanone (MEK)	Bromodichloromethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	1,1,2-Trichloroethane	Trichloroethene	Dibromochloromethane	Ethylbenzene	Xylene (total)
Regional Screening Level - Tapwater		14000	5600	0.13	0.22	2.7	280	0.17	36	11.4	11	0.28	0.49	0.17	1.5	190
MCL		NE	NE	80	80	NE	7	5	70	5	5	5	5	80	700	10,000
MW-3D	5/2/2013	<1.0	<1.0	<1.0	<1.0	<1.0	2.11	<1.0	<1.0	<1.0	<1.0	<1.0	**39.7**	<1.0	<1.0	<1.0
	7/7/2015	<1.0	<1.0	<1.0	0.566J	<1.0	3.88	<1.0	<1.0	<1.0	0.827J	<1.0	**29.0**	<1.0	<1.0	<1.0
	3/1/2018	<1.0	<1.0	<1.0	<1.0	<1.0	1.29	<1.0	<1.0	<1.0	<1.0	<1.0	**30.5**	<1.0	<1.0	<1.0
	4/26/2019	<1.0	<1.0	<1.0	<1.0	<1.0	1.52	<1.0	<1.0	<1.0	<1.0	<1.0	**37.5**	<1.0	<1.0	<1.0
MW-4	5/3/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	2/28/2018	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.87	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MW-5	5/2/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	2/28/2018	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.98	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	4/22/2019	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MW-6	5/3/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**6.83**	<1.0	<1.0	<1.0
	7/7/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	0.867J	<1.00	<1.00	<1.00
	3/1/2018	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**5.57**	<1.00	<1.00	<1.00
	4/26/2019	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**4.01**	<1.00	<1.00	<1.00
MW-7	5/3/2013	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**9.27**	<5.0	**366**	<5.0	<5.0	<5.0
	7/7/2015	<2.00	<2.00	<2.00	2.70	<2.00	<2.00	<2.00	5.51	<2.00	**11.8**	<2.00	**364**	<2.00	<2.00	<2.00
	3/1/2018	<2.00	<2.00	<2.00	2.76	<2.00	<2.00	<2.00	5.64	<2.00	**10.9**	<2.00	**318**	<2.00	<2.00	<2.00
	4/23/2019	<2.00	<2.00	<2.00	1.50	<2.00	<2.00	<2.00	4.55	<2.00	**4.5**	<2.00	**205**	<2.00	<2.00	<2.00
MW-8	5/3/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/7/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	0.360J	<1.00	<1.00	<1.00
	3/1/2018	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.15	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	4/26/2019	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00

Notes:

BOLD values indicate an exceedence of EPA MCLs, November 2018
ug/l = Micrograms/liter; All analytical results expressed in ug/L
B = Detected in Method blank
J = Less than practical quantification level but equal to or greater than minimum detection limit
EPA = Environmental Protection Agency
MCL = Maximum Contaminant Level
ND = Not Detected; NA=Not analyzed; NE = Not Established; N/A = Not applicable

TABLE 3
HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOCs
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

		Volatile Organic Compounds by EPA Method 8260 (µg/L)														
Sample ID	Sample Date	Acetone	2-Butanone (MEK)	Bromodichloromethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	1,1,2-Trichloroethane	Trichloroethene	Dibromochloromethane	Ethylbenzene	Xylene (total)
Regional Screening Level - Tapwater		14,000	5,600	0.13	0.22	2.7	280	0.17	36	11.4	11	0.28	0.49	0.17	1.5	190
MCL		NE	NE	80	80	NE	7	5	70	5	5	5	5	80	700	10,000
MW-9	05/03/13	<200	<200	<200	<200	<200	**303**	<200	**249**	<200	**1,360**	<200	**16,900**	<200	<200	<200
	07/08/15	<100	<100	<100	56.5J	<100	**216**	<100	**459**	<100	**1,000**	<100	**16,500**	<100	<100	<100
	02/28/18	<100	<100	<100	<100	<100	<100	<100	**346**	<100	**741**	<100	**11,700**	<100	<100	<100
	04/22/19	<100	<100	<100	<100	<100	**198**	<100	**359**	<100	**1,530**	<100	**16,100**	<100	<100	<100
MW-10	05/03/13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	02/28/18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	07/07/15	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	0.916J	<1.00	<1.00	<1.00
	04/26/19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MW-10D	05/02/13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	07/07/15	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	02/28/18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	04/26/19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.00	<1.00	<1.00	<1.00
MW-11	05/02/13	<5.0	<5.0	<5.0	<5.0	<5.0	**155**	<5.0	<5.0	<5.0	**34.5**	<5.0	**951**	<5.0	<5.0	<5.0
	06/26/13	<5.0	<5.0	<5.0	<5.0	<5.0	**87.1**	<5.0	64.8	<5.0	**12.0**	<5.0	**394**	<5.0	<5.0	<5.0
	07/07/15	<5.0	<5.0	<5.0	<5.0	<5.0	**105**	<5.0	11.1	<5.0	**22.8**	<5.0	**480**	<5.0	<5.0	<5.0
	03/01/18	<10.0	<10.0	<10.0	<10.0	<10.0	**138**	<10.0	<10.0	<10.0	**53.4**	<10.0	**1,310**	<10.0	<10.0	<10.0
	04/24/19	<5.0	<5.0	<5.0	<5.0	<5.0	**58.4**	<5.0	<5.0	<5.0	**9.94**	<5.0	**374**	<5.0	<5.0	<5.0
MW-11I	05/02/13	<1.0	<1.0	<1.0	<1.0	<1.0	1.66	<1.0	<1.0	1.73	<1.0	<1.0	**131**	<1.0	<1.0	<1.0
	06/26/13	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	**213**	<2.0	<2.0	<2.0
	07/07/15	<2.0	<2.0	<2.0	<2.0	<2.0	0.947J	<2.0	<2.0	<2.0	1.21J	<2.0	**204**	<2.0	<2.0	<2.0
	03/01/18	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.29	<1.0	**136**	<1.0	<1.0	<1.0
	04/26/19	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**98.5**	<1.0	<1.0	<1.0
MW-11D	05/02/13	3.11	<1.0	<1.0	1.15	<1.0	<1.0	<1.0	<1.0	1.23	<1.0	<1.0	**97.9**	<1.0	<1.0	<1.0
	06/26/13	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	**167**	<2.0	<2.0	<2.0
	07/07/15	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	1.16J	<2.00	**242**	<2.00	<2.00	<2.00
	03/01/18	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	**238**	<2.00	<2.00	<2.00
	04/26/19	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	**215**	<2.00	<2.00	<2.00

Notes:

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TABLE 3
HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOCs
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

		Volatile Organic Compounds by EPA Method 8260 (µg/L)														
Sample ID	Sample Date	Acetone	2-Butanone (MEK)	Bromodichloromethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	1,1,2-Trichloroethane	Trichloroethene	Dibromochloromethane	Ethylbenzene	Xylene (total)
Regional Screening Level - Tapwater		14,000	5,600	0.13	0.22	2.7	280	0.17	36	11.4	11	0.28	0.49	0.17	1.5	190
MCL		NE	NE	80	80	NE	7	5	70	5	5	5	5	80	700	10000
MW-12	07/06/15	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	0.418J	<1.00	4.35	<1.00	<1.00	<1.00
	11/24/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**10.7**	<1.00	<1.00	<1.00
	2/25/2016	<1.00	<1.00	<1.00	<1.00	<1.00	1.12	<1.00	<1.00	<1.00	2.82	<1.00	**16.6**	<1.00	<1.00	<1.00
	2/28/2018	<1.00	<1.00	<1.00	<1.00	<1.00	2.69	<1.00	1.10	<1.00	4.44	<1.00	**38.4**	<1.00	<1.00	<1.00
	4/26/2019	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.17	<1.00	**12.1**	<1.00	<1.00	<1.00
MW-12D	07/06/15	<1.00	<1.00	<1.00	0.632J	<1.00	**12.3**	0.905J	3.81	<1.00	**16.2**	<1.00	**146**	<1.00	<1.00	<1.00
	11/24/2015	<1.00	<1.00	<1.00	<1.00	1.05	**9.94**	<1.00	4.21	<1.00	**14.1**	<1.00	**140**	<1.00	<1.00	<1.00
	2/25/2016	<1.00	<1.00	<1.00	<1.00	<1.00	**8.73**	<1.00	3.50	1.09	**13.5**	<1.00	**111**	<1.00	<1.00	<1.00
	2/28/2018	<1.00	<1.00	<1.00	<1.00	<1.00	**9.51**	<1.00	3.83	<1.00	**15.5**	<1.00	**149**	<1.00	<1.00	<1.00
	4/26/2019	<1.00	<1.00	<1.00	<1.00	<1.00	**8.40**	<1.00	3.24	<1.00	**16.1**	<1.00	**148**	<1.00	<1.00	<1.00
MW-13	03/28/18	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
	04/22/19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MW-13I	3/28/2018	<1.00	<1.00	<1.00	<1.00	<1.00	5.07	3.02	2.63	1.05	**7.59**	<1.00	**70.4**	<1.00	<1.00	<1.00
	4/22/2019	<1.00	<1.00	<1.00	<1.00	<1.00	5.02	3.95	3.40	<1.00	**8.81**	<1.00	**99.7**	<1.00	<1.00	<1.00
MW-14I	2/28/2018	<1.00	<1.00	<1.00	<1.00	<1.00	2.23	<1.00	<1.00	<1.00	**3.19**	<1.00	**47.1**	<1.00	<1.00	<1.00
	4/22/2019	<1.00	<1.00	<1.00	<1.00	<1.00	2.51	<1.00	1.13	<1.00	**3.40**	<1.00	**66.5**	<1.00	<1.00	<1.00
MW-15	04/23/19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MW-15D	04/23/19	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**5.03**	<1.00	<1.00	<1.00

Notes:

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TABLE 3
HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOCs
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

		Volatile Organic Compounds by EPA Method 8260 (µg/L)														
Sample ID	Sample Date	Acetone	2-Butanone (MEK)	Bromodichloromethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	1,1,2-Trichloroethane	Trichloroethene	Dibromochloromethane	Ethylbenzene	Xylene (total)
Regional Screening Level - Tapwater		14,000	5,600	0.13	0.22	2.7	280	0.17	36	11.4	11	0.28	0.49	0.17	1.5	190
MCL		NE	NE	80	80	NE	7	5	70	5	5	5	5	80	700	10,000
OW-1	10/02/14	<5.00	<5.00	<5.00	<5.00	7.14	5.26	<5.00	<5.00	4.71J	**10.1**	<5.00	**650**	<5.00	<5.00	<5.00
	12/29/14	<5.00	<5.00	<5.00	<5.00	8.58	3.14J	<5.00	<5.00	<5.00	**15.7**	<5.00	**493**	<5.00	<5.00	<5.00
	04/02/15	<5.00	<5.00	<5.00	<5.00	7.64	3.09J	<5.00	<5.00	**5.58**	**15.1**	<5.00	**392**	<5.00	<5.00	<5.00
	07/08/15	<5.00	<5.00	<5.00	<5.00	6.29	<5.00	<5.00	1.86J	<5.00	**12.7**	<5.00	**514**	<5.00	<5.00	<5.00
	11/24/15	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	**13.3**	<10.0	**767**	<10.0	<10.0	<10.0
	02/25/16	<10.0	<10.0	<10.0	<10.0	5.63	<10.0	<10.0	<10.0	<10.0	**18.0**	<10.0	**518**	<10.0	<10.0	<10.0
	05/31/16	<10.0	<10.0	<10.0	<10.0	4.09	3.78	<10.0	<10.0	<10.0	**9.80**	<10.0	**508**	<10.0	<10.0	<10.0
	09/01/16	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**11.0**	<5.00	**543**	<5.0	<5.0	<5.0
	12/06/16	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	**17.5**	<10.0	**934**	<10.0	<10.0	<10.0
	03/01/18	<5.0	<5.0	<5.0	<5.0	7.00	6.25	<5.0	<5.0	<5.0	**18.7**	<5.0	**909**	<5.0	<5.0	<5.0
	04/26/19	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**315**	<5.0	<5.0	<5.0
IW-1A	07/08/15	<1.0	<1.0	0.348J	0.829J	1.44	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	03/01/18	<1.0	<1.0	<1.0	<1.0	1.29	<1.0	<1.0	<1.0	<1.0	1.63	<1.0	**80.2**	<1.0	<1.0	<1.0
	04/24/19	<1.0	<1.0	<1.0	<1.0	1.32	<1.0	<1.0	<1.0	<1.0	1.11	<1.0	**123**	<1.0	<1.0	<1.0
IW-1B	07/08/15	<1.0	<1.0	<1.0	1.03	1.19	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	03/01/18	13.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	04/24/19	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**25.8**	<1.0	<1.0	<1.0
IW-2A	07/08/15	<1.0	<1.0	<1.0	<1.0	1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
IW-2B	07/08/15	8.44	<1.0	0.631J	1.33	0.786J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.275J	<1.00	<1.00
GP-18	04/09/13	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	**696**	<10	<10	<10

Notes:

BOLD values indicate an exceedence of EPA MCLs, November 2018

ug/l = Micrograms/liter; All analytical results expressed in ug/L

B = Detected in Method blank

J = Less than practical quantification level but equal to or greater than minimum detection limit

EPA = Environmental Protection Agency

MCL = Maximum Contaminant Level

ND = Not Detected; NA=Not analyzed; NE = Not Established; N/A = Not applicable

TABLE 4
SUB-SLAB SOIL GAS ANALYTICAL RESULTS
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

		VOCs in Air by EPA Method TO-15 (µg/m^3)																						
Sample ID	**Date**	Acetone	Benzene	2-Butanone	Carbon Disulfide	Chloroform	Chloromethane	Dichlorodifluoromethane	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Ethanol	Ethylbenzene	4-Ethyltoluene	2-Propanol	Freon 113	Hexane	Methylene Chloride	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Trichlorofluoromethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	m,p-Xylene	o-Xylene
SS-1	5/9/2014	<110	<15	<54	<57	**16 J**	<94	NA	3.1 J	69	<18	<34	<20	<22	<45	<35	<16	<160	79	<25	**6,400**	NA	<22	<22	<20	<20
	2/19/2015	31J	<13	<29	<31	**<20**	<8.3	<34	<16	24J	<16	30J	<17	<20	<25	<77	<14	<14	28J	<22	**2,100**	<22	<20	<20	<17	<17
SS-2	5/9/2014	<530	**<72**	<260	<280	**97 J**	**<460**	NA	17 J	660	170	<170	<97	<110	<220	<170	<79	<780	490	<120	**28,000**	NA	**<110**	<110	<97	<97
	2/19/2015	940J	**<130**	<290	620J	**<200**	<83	<340	**<160**	350J	<160	1,100	**<170**	<200	<250	<770	1,400	450J	410J	<220	**15,000**	<220	**<200**	<200	<170	<170
SS-3	5/9/2014	67 J	<15	<54	<57	**240**	<94	NA	**97**	94	<18	<34	<20	62	35 J	<35	<16	<160	110	250	**6,700**	NA	100	32	25	340
	2/19/2015	62	<6.4	<15	<16	**170**	<4.1	<25	44	67	<7.9	18J	<8.7	<9.8	<12	<38	<7	<6.9	46J	130	**3,100**	<11	<9.8	<9.8	<8.7	14J
SS-4	5/9/2014	64	1.1J	14J	<23	**14**	<38	NA	19	28	<7.2	36	<7.9	<9.0	91	<14	<6.4	<64	38	<10	**2,400**	NA	<9.0	<9.0	<7.9	<7.9
	2/19/2015	48	<6.4	<15	<16	**<9.8**	<4.1	<25	<7.9	<7.9	<7.9	19	<8.7	<9.8	<12	<38	<7	<6.9	24J	<11	**580**	<11	<9.8	<9.8	<8.7	<8.7
SS-5	5/9/2014	22	0.51J	5.2J	<11	1.8 J	<18	NA	<3.6	<3.5	<3.5	8.5	<3.9	<4.4	24	<6.8	<3.2	<31	6.1	<4.9	100	NA	1.0 J	<4.4	1.4 J	<3.9
	2/19/2015	110	1.6J	22	<1.6	<0.98	1.1J	2.7J	<0.81	<0.79	<0.79	32	0.88J	<0.98	16	<3.8	<0.70	<0.69	2.4J	<1.1	29	1.3J	3.8J	1.4J	7.5	2.6J
SS-6	5/9/2014	18 J	<2.8	<10	<11	<4.4	<18	NA	<3.6	<3.5	<3.5	6.0 J	<3.9	<4.4	6.8 J	<6.8	<3.2	<31	14	<4.9	6.4	NA	0.75 J	<4.4	1.5 J	<3.9
	2/19/2015	54	<0.64	6.9	1.6	<0.98	<0.41	2.7J	<0.81	<0.79	0.80J	26	4.9	<0.98	54	<3.8	<0.70	<0.69	54	<1.1	1.4J	1.3J	<0.98	<0.98	19	5.7
Target Sub-Slab Soil Gas Concentration (µg/m3) @ TCR = 1E-06 or HI=1		4,510,000	7	730,000	102,000	18	13,100	14,600	256	29,200	NE	NE	164	NE	29,200	NE	102,000	40,900	1,570	730,000	100	3,100	8,760	8,760	14,600	14,600

Notes:
BOLD values indicate an exceedance of a published regulatory threshold
Target Sub-Slab Concenrations from EPA VISL Calculator, Commerical Exposure, December 2019
µg/m^3 = micrograms per cubic meter
< = Not Detected above laboratory detection limit; NE = Not Established

TABLE 5
INDOOR AIR ANALYTICAL RESULTS
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

		VOCs in Air by EPA Method TO-15 SIM (µg/m^3)																							
Sample ID	**Date**	Acetone	Benzene	Carbon Tetrachloride	Chloroform	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Ethanol	Ethylbenzene	Freon 113	2-Propanol	Hexane	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	m,p-Xylene	o-Xylene
OA-1	5/9/2014	14 J	<3	<5.9	<4.6	<5.6	<5.6	<5.6	<3.8	<3.7	<3.8	<3.7	<3.7	4.4 J	<4	<7.2	<9.2	1.7 J	<6.3	<3.5	<5.1	<5.0	<4.6	<4.6	<4.1	<4.1
	2/18/2015	NA	0.425	0.377	<0.0977	<0.120	<0.120	<0.120	<0.0809	<0.0793	<0.0809	<0.0793	<0.0793	NA	0.108J	0.469	NA	NA	<0.139	0.251	<0.109	<0.107	NA	NA	0.230J	0.126J
AA-1	5/9/2014	20 J	<2.9	<5.8	<4.5	<5.5	<5.5	<5.5	<3.7	<3.6	<3.7	<3.6	<3.6	6.5 J	<4	<7	<9.0	1.8 J	<6.2	<3.5	<5.0	**3.5 J**	0.74 J	<4.5	<4.0	<4.0
	2/18/2015	NA	1.08	0.391	<0.0977	<0.120	<0.120	<0.120	<0.0809	<0.0793	<0.0809	<0.0793	<0.0793	NA	0.939J	0.493	NA	NA	<0.136	0.567	<0.109	1.27	NA	NA	0.234J	0.125J
AA-2	5/9/2014	11 J	<2.8	<5.6	<4.4	<5.4	<5.4	<5.4	<3.6	<3.5	<3.6	<3.5	<3.5	<6.7	<3.9	<6.8	<8.8	1.2 J	<6.1	<3.5	<4.9	**3.3 J**	<4.4	<4.4	<3.9	<3.9
	2/18/2015	NA	1.28	0.409	<0.0977	0.421	0.368	0.394	<0.0809	<0.0793	**0.581**	<0.0793	<0.0793	NA	2.44	0.499	NA	NA	0.364	1.43	<0.109	2.54	NA	NA	5.26	3.60
AA-3	5/9/2014	15 J	<3	<5.9	<4.6	<5.6	<5.6	<5.6	<3.8	<3.7	<3.8	<3.7	<3.7	<7.0	<4	<7.2	<9.2	1.2 J	<6.3	<3.5	<5.1	2.3 J	<4.6	<4.6	<4.1	<4.1
	2/18/2015	NA	<0.0639	<0.126	<0.0977	<0.120	<0.120	<0.120	<0.0809	<0.0793	<0.0809	<0.0793	<0.0793	NA	<0.868	<0.153	NA	NA	<0.136	<0.0754	<0.109	<0.107	NA	NA	<0.0868	<0.0868
AA-4	5/9/2014	18 J	<2.9	<2.9	<5.8	<4.5	<5.5	<5.5	<5.5	<3.7	<3.6	<3.7	<3.6	<3.6	<4	<7	<9.0	0.84 J	<6.2	<3.5	<5.0	2.2 J	<4.5	<4.5	<4.0	<4.0
	2/18/2015	NA	0.89	0.366	<0.0977	<0.120	<0.120	<0.120	<0.0809	<0.0793	0.456	<0.0793	<0.0793	NA	0.3	0.456	NA	NA	<0.136	0.576	<0.109	1.41	NA	NA	0.791	0.432
AA-5	5/9/2014	19 J	<2.9	<2.9	<5.8	<4.5	<5.5	<5.5	<5.5	<3.7	<3.6	<3.7	<3.6	4.0 J	<4	<7	<9.0	4.5	<6.2	<3.5	<5.0	1.4 J	NA	NA	<4.0	<4.0
	2/18/2015	NA	0.998	0.382	<0.0977	<0.120	<0.120	0.135J	<0.0809	<0.0793	0.442	<0.0793	<0.0793	NA	0.827	0.477	NA	NA	0.141J	0.847	<0.109	1.43	NA	NA	2.32	1.17
AA-6	5/9/2014	17 J	<2.8	<5.6	<4.5	<5.4	<5.4	<5.4	<3.7	<3.6	<3.6	<3.6	<3.5	<6.9	<3.9	<6.8	2.8 J	0.69 J	<6.2	<3.5	<5.0	1.7 J	<4.5	<4.5	<4.0	<4.0
	2/18/2015	NA	0.77	0.384	<0.0977	0.166J	0.147J	0.170J	<0.0809	<0.0793	0.252	<0.0793	0.356	NA	0.931	0.478	NA	NA	<0.136	0.795	<0.109	0.74	NA	NA	2.64	1.28
AA-7	5/9/2014	17 J	<2.8	<5.6	<4.4	<5.4	<5.4	<5.4	<3.6	<3.5	<3.6	<3.5	<3.5	3.7 J	<3.9	<6.8	<8.8	0.83 J	<6.1	<3.5	<4.9	<4.8	<4.4	<4.4	<3.9	<3.9
	2/18/2015	NA	0.831	0.392	<0.0977	<0.120	<0.120	<0.120	<0.0809	<0.0793	0.207	<0.0793	<0.0793	NA	0.150J	0.504	NA	NA	<0.136	0.504	<0.109	0.672	NA	NA	0.408J	0.191J
Regional Screening Level (RSL) for Industrial Air (µg/m3) @ TCR = 1E-06 or HI=1		140,000	1.6	2	0.53	880	NE	1.1	7.7	880	0.47	NE	NE	NE	4.9	NE	880	3,100	47	22,000	22,000	3	260	260	440	440

BOLD values indicate an exceedance of a published regulatory threshold
EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2019
µg/m^3 = micrograms per cubic meter
< = Not Detected above laboratory detection limit; NE = Not Established
NA = Not Analyzed (not included in analtyical list due to SIM method)

Table 6
Summary of Potential ARARs and TBCs
Former Joslyn Clark Controls Facility
Lancaster, South Carolina

Citation	Description	Potential Applicability
Chemical-specific ARARs		
40 CFR Part 141	National Primary Drinking Water Regulations	Standards for Groundwater
SC R. 61-58.5	Maximum Contaminant Levels in Drinking Water	Standards for Groundwater
SC R.61-68	SCDHEC Water Classifications and Standards for Surface Waters and Groundwater (specifically R.61-68H(4) which empowers SCDHEC to require owners and operators of contaminated sites to restore the groundwater quality to a level that maintains and supports the existing and classified uses, and R.61-68H(9) to (11), which establishes groundwater quality standards, based on classification).	Quality Standards for Groundwater
40 CFR Part 264, Subpart X	VOC emission requirements	Air stripping and carbon adsorption
SC R. 61-79.264	VOC emission requirements	Air stripping and carbon adsorption
Location-specific TBCs		
36 CFR Part 65	National Archaeological and Historical Preservation Act	Remedial actions that may be located on areas previously undisturbed and may threaten significant scientific, prehistoric, historic, or archaeological data
36 CFR Part 800	National Historic Preservation Act	Remedial actions that may be located within areas owned
Executive Order 11900	Protection of Wetlands	Remedial actions that may be located in wetland areas or cause a disturbance of wetlands

Table 6
Summary of Potential ARARs and TBCs
Former Joslyn Clark Controls Facility
Lancaster, South Carolina

Citation	Description	Potential Applicability
50 CFR Parts 17, 402, 424, and 450	Endangered Species Act	Remedial actions that may be located in endangered species habitats or cause a disturbance of habitats
Action Specific ARARs		
33 USC 1313 and 40 CFR Part 122 -125 (NPDES regulations)	Clean Water Act	Actions involving groundwater treatment and discharges
40 CFR Parts 50, 52, 60, 61	Clean Air Act	Air emissions from treatment facilities
40 CFR Parts 144 to 146 And SCR.61-87	Underground Injection Control Regulations	Action which result in the injection of fluids into the subsurface
29 CFR 1910 and 1926	Occupational Safety and Health Act	All activities conducted on site
SC R. 61-9	SCDHEC Water Pollution Control Permits	Actions involving groundwater treatment and discharges to waters of the state (including groundwater via land application)
SC R. 61-62	SCDHEC Air Pollution Control Regulations	Actions resulting in air emissions
40 CFR parts 239 to 282	Resource Conservation and Recovery Act (RCRA)	Actions involving clean up and management of solid and hazardous waste
42 U.S.C. § 9601	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)	Federal law designed to clean up sites contaminated with hazardous substances and pollutants

APPENDIX A – ISCO PILOT TEST REPORT

ERM NC, Inc.

15720 Brixham Hill Avenue
Suite 120
Charlotte, NC 28277
Tele: 704-541-8345
Fax:704-624-7928
www.erm.com

September 10, 2015

Mr. Lucas Berresford
SCDHEC – State Voluntary Cleanup Section
Bureau of Land & Waste Management
2600 Bull Street
Columbia, SC 29201
803-896-4071

Subject: In-Situ Chemical Oxidation Pilot Test and Monitor Well Installation Report
Joslyn Clark Controls, LLC Facility
2013 West Meeting Street
Lancaster County, South Carolina

Dear Mr. Berresford:

On behalf of Joslyn Clark Controls, LLC, ERM NC, Inc. (ERM) is pleased to present one hard copy and one electronic copy of the In-Situ Chemical Oxidation Pilot Test and monitor Well Installation Report for the above referenced site. A copy of this report is also being submitted to Mr. Christopher Wargo at the UIC Section.

Should you have any questions or comments, feel free to contact us at (704) 541-8345.

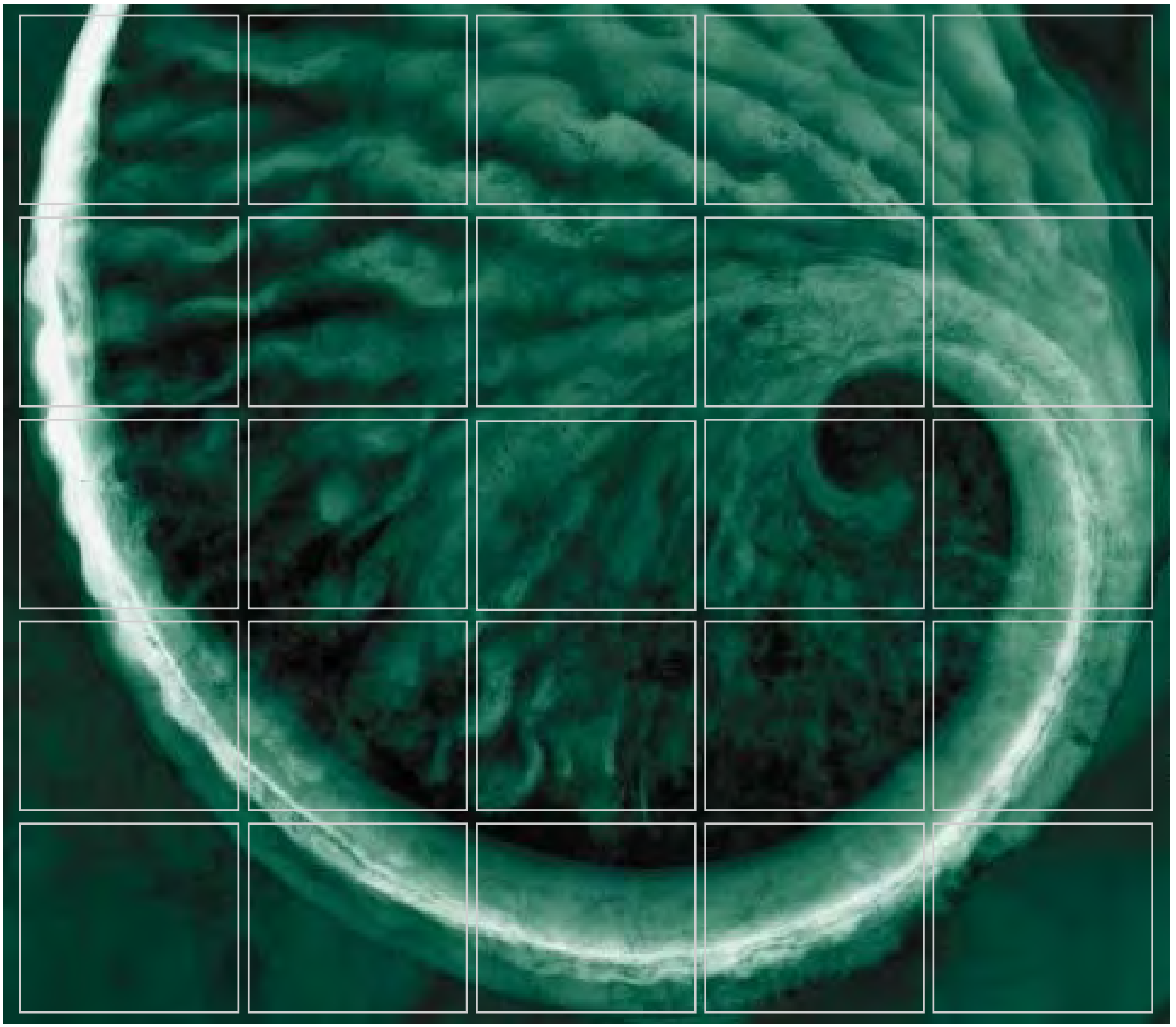
Sincerely,

Rick Tarravechia, P.G.
Partner in Charge

RICHARD J. TARRAVECHIA REGISTERED NO. 2060 SOUTH CAROLINA PROFESSIONAL GEOLOGIST

Michael Pressley, P.G.
Project Manager

cc: Mr. Carl Grabinski – Joslyn Clark Controls
cc: Mr. Christopher Wargo – SCDHEC UIC Section



Joslyn Clark Controls, LLC

Pilot Test Results and Monitor Well Installation Report
September 10, 2015

Joslyn Clark Controls, LLC Facility
2013 W. Meeting Street
Lancaster, South Carolina

Delivering sustainable solutions in a more competitive world

ERM

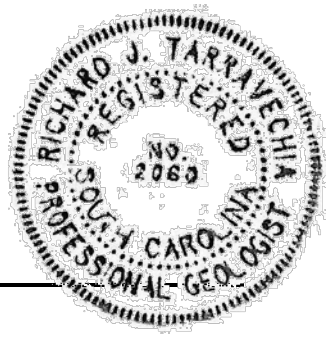
Joslyn Clark Controls, LLC

Pilot Test Results and Monitor Well Installation Report

Joslyn Clark Controls, LLC Facility
2013 W. Meeting Street
Lancaster, South Carolina
VCC 13-5875-RP

September 10, 2015

Project No. 0253066



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Principal-in-Charge

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ERM

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

1,4D	1, 4-dioxane
DCA	dichloroethane
DCE	dichloroethene
ERM	ERM NC, Inc.
ESA	Environmental Site Assessment
FS	Feasibility Study
HHRA	Human Health Risk Assessment
ISCO	In-Situ Chemical Oxidation
Joslyn Clark	Joslyn Clark Controls, LLC
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
PCE	tetrachloroethene
QA	Quality Assurance
RI	Remedial Investigation
RSL	Risk Screening Level
SCDHEC	South Carolina Department of Health and Environmental Control
SGS	soil gas survey
SRS	sensitive receptor survey
TCA	trichloroethane
TCE	trichloroethene
UIC	Underground Injection Control
µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
VCC	Voluntary Cleanup Contract
VI	vapor intrusion
VOC	volatile organic compound

1.0 INTRODUCTION

This *Pilot Test Results and Monitor Well Installation* report was prepared by ERM NC, Inc. (ERM) on behalf of Joslyn Clark Controls, LLC (Joslyn Clark) for the Joslyn Clark facility (Site) located at 2013 W. Meeting Street, Lancaster, Lancaster County, South Carolina (see Figure 1). The *In-Situ Chemical Oxidation (ISCO) Pilot Test Work Plan* (ERM April 2014) was approved by South Carolina Department of Health and Environmental Control (SCDHEC) per the requirements of the Voluntary Cleanup Contract (VCC) 13-5875-RP executed October 2, 2013 between the SCDHEC and Joslyn Clark. The purpose of this report is to document the results of the Pilot Test conducted at the Site.

1.1 SITE DESCRIPTION AND BACKGROUND

The subject property consists of 23 acres of land and is developed with two buildings. The now vacant former manufacturing building was constructed in 1964 and consists of approximately 180,000 square feet of floor space. The now vacant former warehouse/storage building was constructed in 1967 and consists of approximately 14,400 square feet of floor space. The subject property has been used to manufacture electrical control equipment for fire safety purposes since its construction in 1964. Figure 2 illustrates the general property layout.

The principal raw materials for manufacturing onsite included sheet metal, copper wire, pre-manufactured metal and plastic components, electrostatic paint, and oil-based paint. Joslyn Clark's primary production activities included the fabrication of metal cabinets, which were finished with various electrical, plastic, and metal components purchased from other off-site manufacturers. The Joslyn Clark facility had been a regulated source of air emissions, industrial wastewater discharge, and a generator of hazardous waste.

1.2 ENVIRONMENTAL INVESTIGATION HISTORY

Previous site assessment and remediation activities have included:

- A *Phase I Environmental Site Assessment* (ESA) was conducted by ERM in January 2009 that identified potential environmental concerns related to a former metal plating operation and a former degreasing operation which used trichloroethene (TCE) as a solvent.
- *Phase II ESA* activities conducted in 2009 which included the installation of 15 soil borings and seven permanent groundwater monitoring wells (MW-1 through MW-7) to assess areas of potential environmental concern identified in the *Phase 1 ESA*. Based on results of the *Phase II ESA*, TCE was detected in several soil samples at low concentrations. TCE was also detected in four monitoring wells at concentrations ranging from 7.7 micrograms per liter (µg/L)

to 2,700 µg/L, which is above the established South Carolina Maximum Contaminant Level (MCL) for TCE of 5.0 µg/L.

- During January of 2011, Joslyn Clark conducted a sensitive receptor survey (SRS). The SRS indicated that the closest water supply well to the site was located at a residential trailer park about 645 feet upgradient from the Joslyn Clark site and according to the property owner, was not in use. The next closest water well was almost 3,500 feet from the Joslyn Clark site, also in the general upgradient direction.
- *Phase III ESA* activities were conducted in 2011 to further delineate the volatile organic compound (VOC) plume in groundwater and collect additional soil samples. Three additional shallow monitoring wells (MW-8, MW-9 and MW-10) were installed to further evaluate the horizontal extent of the VOC plume. Two deep wells (MW-3D and MW-10D) were installed to evaluate the vertical extent of the VOC impacted groundwater at the site. Groundwater samples collected during the *Phase III* activities showed multiple chlorinated compounds, with TCE and tetrachloroethene (PCE) being the most prevalent.
- A passive soil gas survey (SGS) was initiated on November 27-29, 2012 with the installation of 60 soil gas points in the northwest portion of the manufacturing building. Twenty-five (25) VOCs were identified in the soil gas samples. The highest VOC concentrations were found at the two locations in the northwest portion of the building, in the vicinity of the former wastewater treatment room, and the former paint booth and sump (southwestern portion of the building).
- During March and April 2013, ERM conducted a *Remedial Investigation* (RI) at the facility to further characterize the source of the observed TCE plume originating inside the building and to collect additional information to facilitate subsequent groundwater remediation activities. Activities included the installation of five soil borings, one temporary well and three permanent monitoring wells inside the building (MW-11, MW-11I, and MW-11D). The results of these RI activities included:
    - The passive soil gas study indicated that tetrachloroethylene (PCE) and TCE vapors are present within the pore space of the soil in the vicinity of the former wastewater treatment room and former paint booth and sump (southwestern portion of the building). Confirmatory samples collected from these areas did not identify the presence of chlorinated VOCs in soil.
    - The VOC 1, 4-Dioxane (1,4D) was detected in soil samples collected from each of the five borings at the shallow (3-5 foot) and deep (13-15 foot intervals. The concentrations of 1,4D ranged from 0.404 milligrams per kilogram (mg/kg) to 0.992 mg/kg, which exceeds the risk-based protection of groundwater standard of 0.00014 mg/kg, but not the residential soil screening level of 4.9 mg/kg. 1, 4D was detected in only

two groundwater samples, temporary well GP-19 (0.95 µg/L) and shallow well MW-11 (0.787 µg/L).

- The vertical extent of VOC-affected groundwater has not been completely defined; however, the bulk of the VOC mass in groundwater is at the shallow depths, and therefore further delineation of the vertical extent of TCE-affected groundwater is not necessary for remedial purposes.
- The horizontal extent of the TCE-affected groundwater at the site is delineated and the TCE plume is confined to the subject property.

- A *Human Health Risk Assessment* (HHRA) was prepared dated September 23, 2013 and the results indicate there is limited risk/hazard to human health receptors at the site, with the exception of site/ maintenance workers who may be exposed to organic vapors migrating from groundwater, and to a lesser extent construction workers who may contact impacted subsurface soil during future excavation or trenching activities.
- A *Feasibility Study (FS) Work Plan* was submitted to SCDHEC dated November 18, 2013. The *FS Work Plan* evaluated various remedial technologies against the EPA criteria for feasibility studies. ISCO was selected as the technology with the highest potential for success at the Site.
- On February 5, 2014, SCDHEC issued a letter to Joslyn Clark requesting that: 1) an additional well pair be installed near the downgradient property line; 2) additional assessment was needed to delineate the vertical extend of affected groundwater; and 3) the vapor intrusion pathway had not been evaluated. On March 19, Joslyn Clark responded with a letter stating that the downgradient well pair would be installed, and that the vapor intrusion pathway would be investigated. However, Joslyn Clark also stated that the vertical profile, although not completely delineated to drinking water standards, was sufficiently delineated for remedial design purposes.
- During April and May, 2014, an *ISCO Pilot Test Work Plan* and subsequent pilot test work plan addendum were submitted to SCDHEC. The work plan was approved and the ISCO injection pilot test was performed during June 3 through July 2, 2014. Post injection monitoring was performed on a quarterly basis thereafter.
- During May 2014, a vapor intrusion (VI) assessment was performed at the site which identified the presence of TCE in soil gas beneath the building floor slab at concentrations of up to 28,000 micrograms per cubic meter (µg/m^3). TCE was detected in indoor air at concentrations ranging from 1.7 to 3.5 µg/m^3. The Risk Screening Level (RSL) for TCE is 3.0 µg/m^3. At the request of SCDHEC, a second, post-pilot test VI assessment was conducted at the site during February 2015. Soil -as concentrations of TCE were significantly lower than during the previous event, and TCE was detected in five of the seven indoor air samples at

concentrations ranging from 0.672 µg/$m^3$to 2.54 µg/m^3. These concentrations were less than the May 2014 detected concentrations and also below the industrial RSL for TCE of 3.0 µg/m^3.

- During late April, 2015 an additional downgradient monitor well pair was installed near the property at SCDHEC's request. The well pair, along with all other monitor wells, was sampled during July 2015. The results of the site-wide monitoring event are summarized herein.

Figure 2 illustrates the locations of the onsite groundwater monitor wells. It should be noted that monitor well MW-9 was installed proximal to the two former off-site wastewater lagoons. The former lagoons are not associated with the Joslyn Clark site.

2.0 PILOT TEST RESULTS

2.1 INJECTION EVENT

In accordance with the *Pilot Test Work Plan* approved by SCDHEC on May 15, 2014, ERM conducted a Pilot Test at the subject property from June 30 to July 2, 2014. The purpose of the Pilot Test was to evaluate ISCO as a remediation technique for treating groundwater at the source area contaminated with TCE, and to a lesser extent, 1,1-dichloroethene (DCE), cis-1,2-DCE, and vinyl chloride.

The pilot test focused on the source area located inside the former manufacturing building. This source area is located in the vicinity of MW-3, where the highest concentrations of TCE (relative to Joslyn Clark's activities) have been detected at the site. Two permanent injection locations were installed in a line approximately 9 feet upgradient of MW-3, spaced 10-feet apart. The two injection locations were designated IW-1 and IW-2. Both injection locations contained two 2-inch diameter injection wells with 0.010-inch machine slotted well screens open to depths of 50 to 60 feet, and 63 to 70 feet below the concrete floor. At the IW-1 location, the shallow injection point screened from 50 to 60 feet was designated IW-1A, while the injection well screened from 63 to 70 feet was designated IW-1B. The same nomenclature was applied to the two injection wells installed at location IW-2. Well construction diagrams, boring logs, and construction records were previously submitted to SCDHEC in the *Pilot Test Work Plan* and in the Underground Injection Control (UIC) Permit Application.

Following receipt of SCDHEC approval and the UIC permit #SCHE03020412, ERM and its subcontractor, Redox Tech, LLC of Cary, North Carolina, mobilized to the site with equipment and personnel necessary to complete the injection using sodium permanganate as the chemical oxidant. Sodium permanganate concentrate was shipped directly to the site and staged near the southern loading dock. Approximately 500 gallons of 5% sodium permanganate solution (approximately 48 gallons of Remox L® and 452 gallons of per injection point) were mixed and pressure injected at the site into each of the injection points (four wells located at two cluster locations) under injection pressures ranging from 30 to 85 psi. The injection event was completed over two and a half days. A layout of the injection points is provided in Figure 2. The locations of the injection well clusters and the observation well were surveyed by a South Carolina licensed surveyor.

2.2 ISCO GROUNDWATER MONITORING

Groundwater monitoring was conducted in the existing wells located at the Site during May 2013, thirteen months before the Pilot Test activities. A pre-injection baseline monitoring event was scheduled for the week prior to the injection, but due to an oversight, the ISCO injection occurred prior to collection of baseline groundwater

samples as discussed in the work plan from the wells in the ISCO treatment area (MW-2, MW-3, OW-1, IW-1, IW-2). As such, previously collected data (May 2013) from pilot test area monitor wells (upgradient well MW-2 and source area well MW-3) are being used as indicative of site baseline groundwater impact conditions.

Following the injection, the ISCO treatment area wells were checked visually for the presence of permanganate on August 8, 2014, seven days after the cessation of the injection activities. Groundwater monitoring of the pilot test area wells occurred on a quarterly basis thereafter, at 90, 180, 270, and one year following the injection.

At the seven day mark, the purple indicator color of sodium permanganate was identified in the injection wells (IW-1A, IW-1B, IW-2A, IW-2B) and in monitor well MW-3, located 9 feet downgradient from the injection wells. During the 90 day, 180 day, 270 day, and one year monitoring events, a faint purple hue was also noted in observation well OW-1, located 15.5 feet from the injection wells. The presence of oxidant in MW-3 and OW-1 located downgradient of the injection wells indicates that delivery of the oxidant was achieved in the target shallow aquifer zone, with an effective radius of 15 feet.

Groundwater samples collected for laboratory analyses throughout the duration of the project were submitted to South Carolina Certified GCAL Laboratories of Baton Rouge, Louisiana and analyzed for volatile organic compounds (VOCs) by EPA method 8260, sodium and manganese by EPA method 6010 and chloride by EPA method 300. The pilot test well MW-3 exhibited sufficient amounts of permanganate that low flow purging was not performed on this well due to concerns over damage to the sampling equipment. Instead, a "grab" sample was obtained from well MW-3. To collect viable groundwater samples from OW-1 and MW-3, where permanganate was observed, samples from the those two wells were placed in 40 ml unpreserved vials and the oxidation reaction was arrested or "quenched" by adding 2 mg of ascorbic acid to the sample. In some cases, duplicate samples were collected from OW-1 and MW-3, with one sample being "quenched" with ascorbic acid and the other being "unquenched" (i.e., no ascorbic acid was added to the sample vial). The difference between "quenched" and "unquenched" results was determined to be almost insignificant. In fact, slightly higher concentrations were evident in the "unquenched" samples, as shown in the table below:

Comparison of Quenched vs. Unquenched Analysis

Sample ID	Sample Date	Event	Volatile Organic Compounds by EPA Method 8260 (µg/L)								
			Acetone	2-Butanone (MEK)	Chloroform	1,1-DCA	1,1-DCE	Methylene chloride	PCE	1,1,2-TCA	TCE
MW-3	04/02/15	270 Day Quenched	35.2	1.2	1.29	6.52	<1.00	2.3	<1.00	0.931J	<1.00
	04/02/15	270 Day Unquenched	24.2	<1.00	1.28	6.79	<1.00	1.32	<1.00	1.02	**2.25**
OW-1	12/29/14	180 Day Quenched	<2.00	<2.00	<2.00	7.68	0.820J	<2.00	15.5	<2.00	**323**
	12/29/14	180 Day Unquenched	<5.00	<5.00	<5.00	8.58	3.14J	<5.00	15.7	<5.00	**493**
	04/02/15	270 Day Quenched	<5.00	<5.00	<5.00	7.08	1.22J	5.58	14.9	<5.00	**312**
	04/02/15	270 Day Unquenched	<5.00	<5.00	<5.00	7.64	3.09J	<5.00	15.1	<5.00	**392**

DCA = dichloroethane TCA = trichloroethane

Based on the comparison results shown above, during future sampling events, wells exhibiting a purple hue from sodium permanganate will be collected for analysis "unquenched."

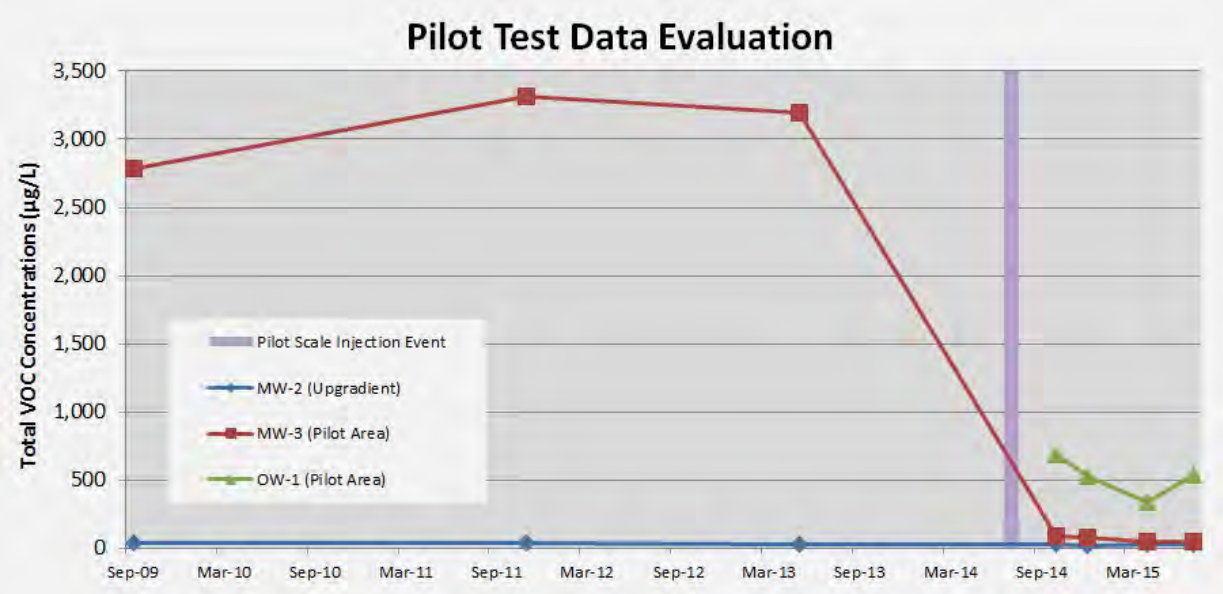
Review of the pilot test data indicate that VOC concentrations in the study area were reduced through chemical oxidation. Specifically, TCE concentrations in MW-3 decreased from over 3,000 µg/L to less than 3 µg/L at the 270 day mark before a slight rebound to 13.9 µg/L was noted at the end of the one year study period. A similar but more pronounced rebound was also noted at the 1 year mark in OW-1. Nevertheless, based on the most recent post ISCO injection sampling results (1 year mark), injected permanganate appears to still be present (i.e., a purple color) in MW-3 and OW-1 indicating good saturation and contact of the permanganate with the VOC affected aquifer. The TCE results for the study area wells are summarized below:

TCE Concentrations (µg/L) - ISCO Area Groundwater Monitoring

Well	Location	Background	1 Week	90 Day	180 Day	270 Day	1 Year	Percent Change
MW-2	Background	34.5	NS	29.7	24.5	28.1	27.6	-20
MW-3	Source	3,120	Perm	7.25	3.51	2.25	13.9	-99
OW-1	Downgradient	NS	NS	650	493	392	514	-21*
IW-1A	Injection Point	NS	Perm	Perm	Perm	Perm	Perm	NA
IW-1B	Injection Point	NS	Perm	Perm	Perm	Perm	Perm	NA
IW-2A	Injection Point	NS	Perm	Perm	Perm	Perm	Perm	NA
IW-2B	Injection Point	NS	Perm	Perm	Perm	Perm	Perm	NA

Pilot Test injection conducted in IW-1A, B and IW-2A, B on June 30 through July 1, 2014
Perm = Permanganate Observed –No sample collected
When both "quenched" and "unquenched" samples were collected, this table shows the higher result of the two
ND = Not Detected NS = No sample collected µg/L = micrograms per liter
** = 90 day analytical result used as baseline*
Analytical results shown in purple indicate that permanganate was observed in the sample

A TCE concentration over time trend-graph for the key pilot test area wells is shown below.



The manganese in samples collected from MW-3 show a marked increase from baseline concentrations, increasing from non-detectable levels (less than 15 µg/L) to 37,800 µg/L at the 90 day event, then decreasing to 19,300 µg/L by the 1 year event. Similarly, sodium concentrations also increased sharply from 8,670 µg/L prior to the injection event to 58,300 µg/L at the 90 day mark before being reduced to 26,900 µg/L at the 1 year mark following injection. The marked increases in manganese and sodium indicate good distribution of oxidant in the pilot test area. Chloride levels have remained generally constant throughout the duration of the test. The analytical results for manganese, sodium, and chloride are presented in Table 1. Laboratory analytical data sheets are attached in Appendix A.

Observations (including analytical sampling of MW-3 and OW-1) of the ISCO treatment area will be conducted for another four quarters to further evaluate longer term trends.

3.0 MONITOR WELL INSTALLATION & GROUNDWATER MONITORING

3.1 MONITOR WELL INSTALLATION

As requested by the SCDHEC in a February 5, 2014 letter, a downgradient well pair was installed near the southern property boundary on April 28-30, 2015. The location of the well pair is approximately shown on Figure 2. The well installation activities were conducted in accordance with the approved work plan dated December 2, 2014. The installation activities and well logs were initially reported to SCDHEC in the Second Quarterly Progress Report for 2015. As noted in the Progress Report, the shallow well (MW-12) was installed to a depth of 55 feet below grade. The deep well (MW-12D) was completed with a 6-inch outer casing installed to 75 feet below grade and the inner 2-inch well was installed to 110 feet below grade. Well construction records and diagrams are included in Appendix B.

3.2 SITE WIDE GROUNDWATER MONITORING

During the 1 year ISCO Pilot Test monitoring event conducted July 6 through July 8, 2015, existing monitor wells across the Joslyn Clark site were gauged and sampled in accordance with the procedures approved in the Pre-Remedial Assessment Plan dated September 11, 2012. The depths to groundwater and the calculated groundwater elevations are presented in Table 2.

Water level measurements were obtained in the site monitor wells on July 6, prior to well purging and sampling activities using a decontaminated electronic water level meter. Using top of casing elevations and the depth to water measurements, site groundwater elevations were calculated and groundwater flow maps for the shallow (55 feet) and deep (generally 110 feet) wells were generated. As shown on Figures 3 and 4, groundwater in both aquifer zones generally flows south.

Groundwater samples were collected using low flow purging techniques. Field sampling forms are presented in Appendix C. The samples were submitted to GCAL for VOC analysis by EPA Method 8260B. The analytical results of the site wide monitoring event are presented in Table 3. With the exception of the pilot test area wells (see Section 2) and the newly installed MW-12/MW-12D well pair, the analytical results correlate well with previous monitoring events.

As shown on Table 3, newly installed wells MW-12 and MW-12D detected TCE near the southern property line at an approximate distance of 870 feet from the MW-3 source area. Specifically, TCE was detected in the shallow well, MW-12, at 4.35 µg/L and in the deep well, MW-12D, at 146 µg/L. The South Carolina Maximum Contaminant Level (MCL) for TCE is 5 µg/L. TCE isoconcentration maps for the shallow and deep

aquifers are presented in Figures 5 and 6. Laboratory analytical data sheets are presented in Appendix A.

3.3 LABORATORY DATA QUALITY ANALYSIS

Quality assurance/quality control (QA/QC) samples collected during the July 2015 groundwater sampling activities included two blind duplicate samples, two equipment rinse blanks, and one trip blank. Groundwater QA/QC samples were analyzed for VOCs by EPA Method 8260B. Duplicate groundwater sample analytical results and an analysis of the QA/QC samples with regards to industry standard data quality indicators (DQI), including bias, completeness, comparability, precision, and method sensitivity, is presented in Table 4. Based on a review of the DQI analysis, the data collected during the July 2015 sampling event is considered to be valid.

4.0 SUMMARY

ERM conducted a Pilot Test at the subject property from June 30 to July 2, 2014. The purpose of the Pilot Test was to evaluate ISCO using sodium permanganate as a remediation technique for treating groundwater at the source area contaminated with TCE, and to a lesser extent, 1,1- DCE, cis 1,2-DCE, and vinyl chloride. Additionally, a groundwater monitor well pair (shallow well MW-12 and deep well MW-12D) was installed at the downgradient (southern) property line.

4.1 PILOT TEST

Review of the pilot test data indicate that TCE concentrations in the study area were reduced through oxidation at well MW-3 from 3,120 µg/L to 2.25 µg/L at the 270 day mark before a slight rebound to 13.9 µg/L was noted at the end of the one year study period. A similar but more pronounced rebound was also noted at the 1 year mark in OW-1. Nevertheless, based on the most recent post ISCO injection sampling results (1 year mark), injected permanganate is still present (i.e., a purple color) in MW-3 and OW-1 indicating good saturation and contact of the permanganate with the VOC affected aquifer. Also, manganese and sodium concentrations within the pilot test area wells showed marked increases, indicating good distribution of oxidant in the pilot test area. The results of the pilot test indicate that ISCO using sodium permanganate is a viable remediation technique for the Joslyn Clark site. Observations (including analytical sampling of MW-3 and OW-1) of the ISCO treatment area will be conducted for another four quarters to further evaluate longer term contaminant reduction trends.

4.2 NEW MONITOR WELLS

Newly installed wells MW-12 and MW-12D detected TCE near the southern property line at an approximate distance of 870 feet from the MW-3 source area. TCE was detected in the groundwater samples collected from shallow well, MW-12, at 4.35 µg/L and in the sample collected from deep well, MW-12D, at 146 µg/L. The South Carolina MCL for TCE is 5 µg/L.

Joslyn Clark is planning to re-sample the MW-12/MW-12D well pair using the same methods outlined in the approved work plan prior to making any decisions on the installation of additional wells. In the event that the re-sampling of the MW-12/MW-12D well pair confirm the presence of TCE in groundwater above the MCL, a work plan for the installation of additional monitor wells will be submitted to SCDHEC under separate cover.

5.0 REFERENCES

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Figures

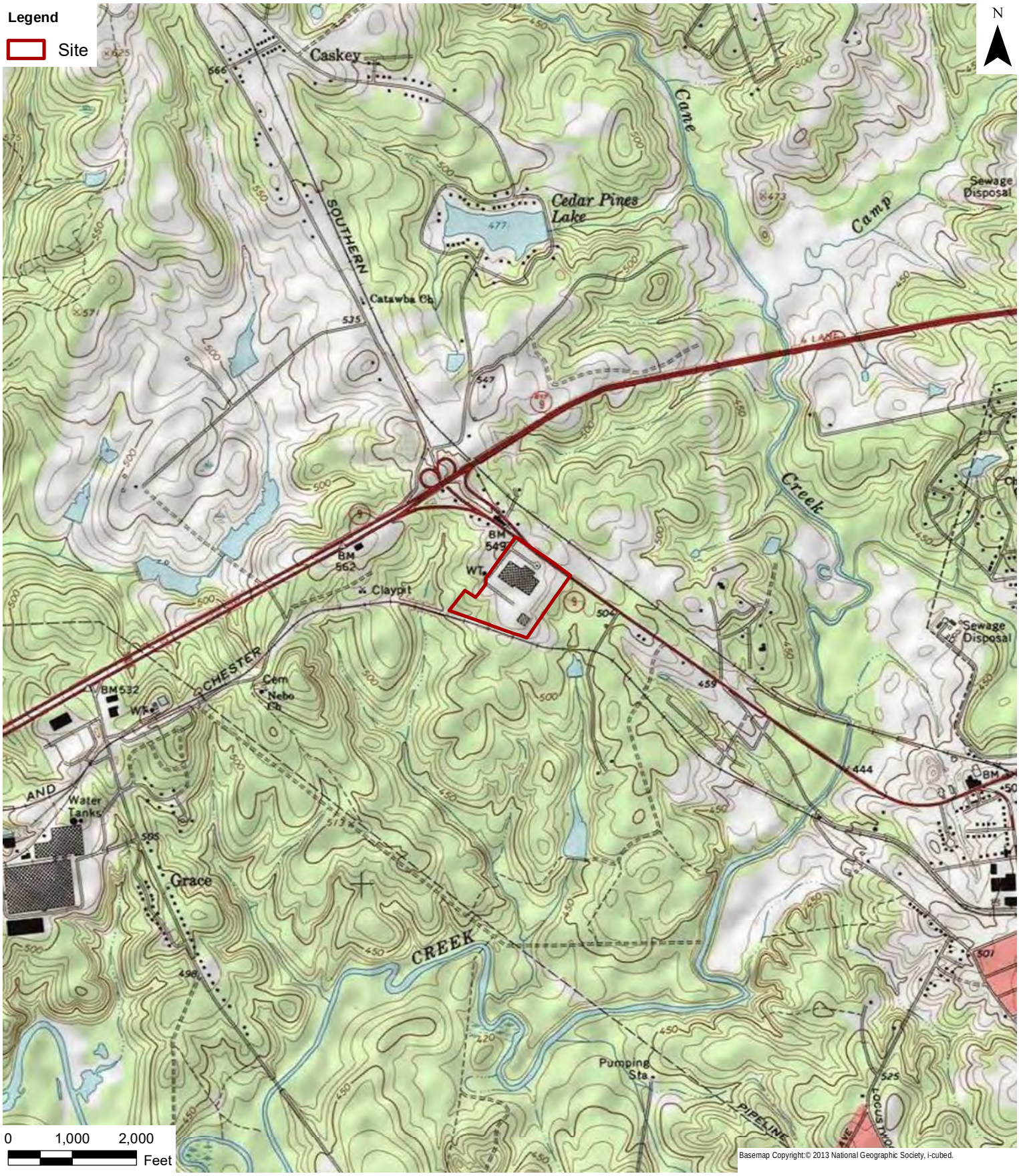

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FIGURE 1
SITE LOCATION MAP

Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster, Lancaster County, SC

N

Legend

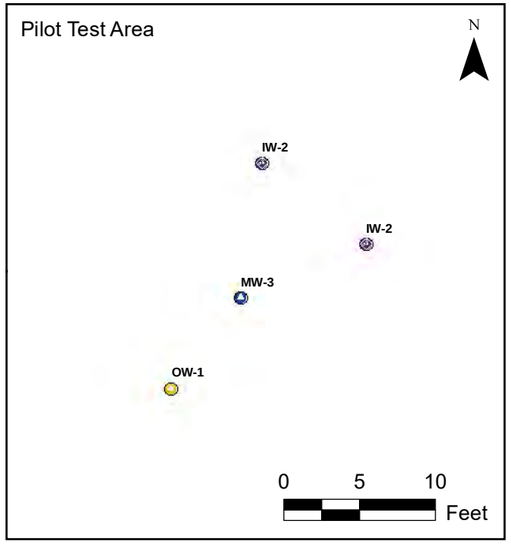
- Parcels
- Former Off-Site Lagoons

Monitor Wells

- Shallow Monitor Well
- Deep Monitor Well
- Intermediate Monitor Well

Pilot Test Wells

- Injection Well
- Observation Well



Basemap Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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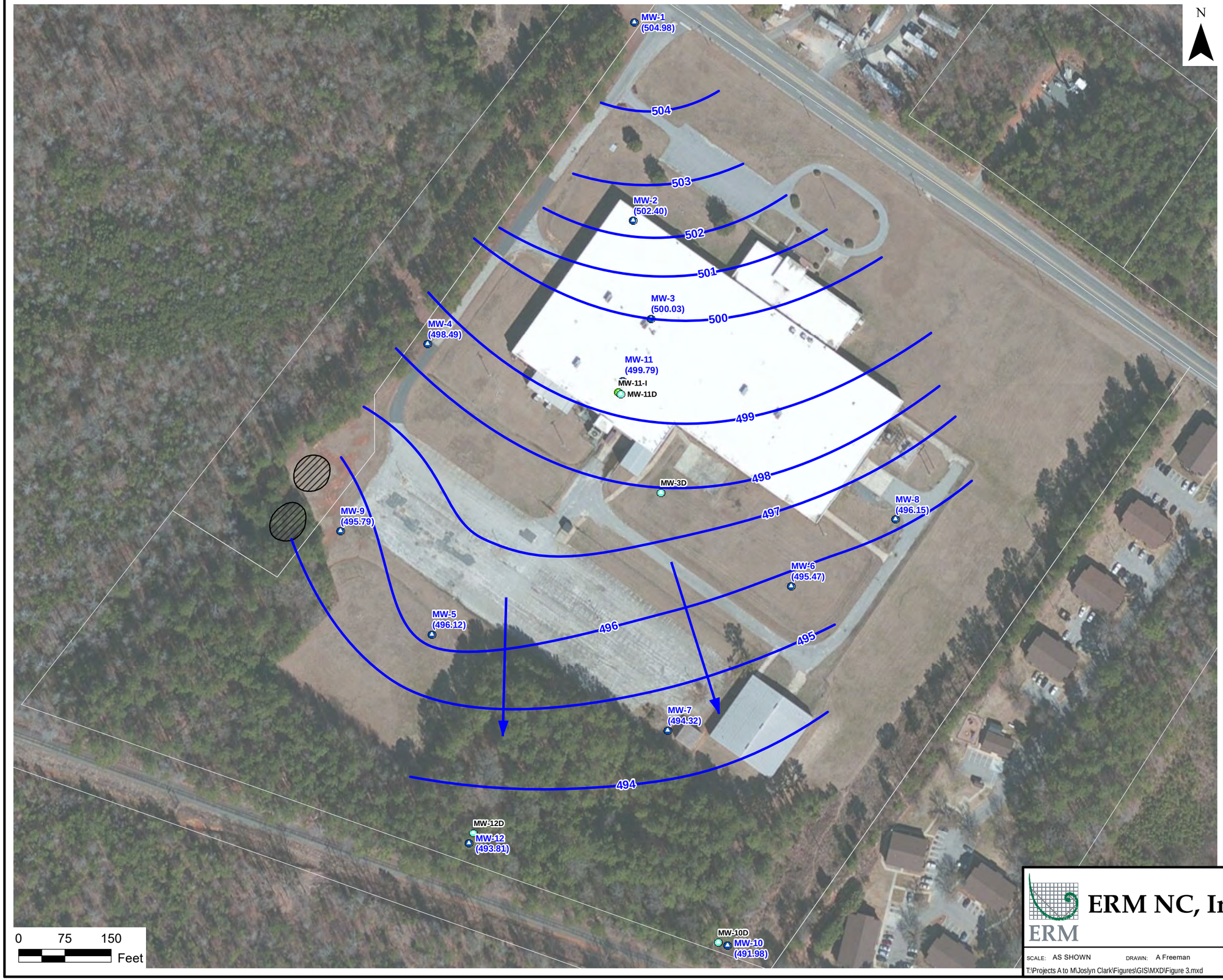
FIGURE 2
Site Plan with Monitor Wells and Pilot Test Wells
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster, Lancaster County, SC



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Legend

Parcels

Former Off-Site Lagoons

Monitor Wells

Shallow Monitor Well

Deep Monitor Well

Intermediate Monitor Well

Groundwater Elevations - July 2015

Water Table Elevation Contour

(Dashed in Areas of Less Certainty)

Approximate Groundwater Flow Direction

Basemap Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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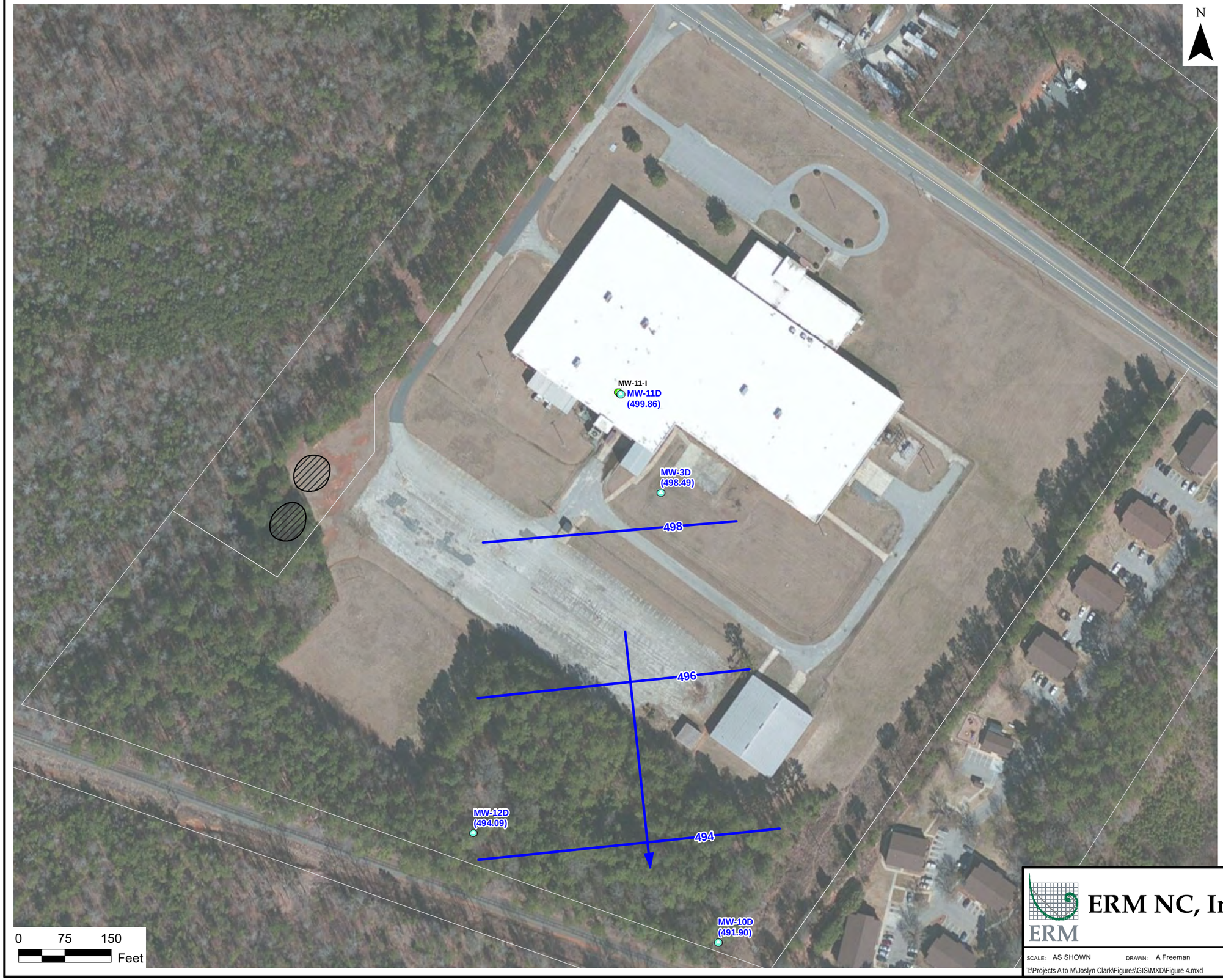
FIGURE 3
Groundwater Flow Map
Shallow Aquifer - July 2015
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster, Lancaster County, SC



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Parcels

Former Off-Site Lagoons

Monitor Wells

Deep Monitor Well

Intermediate Monitor Well

Groundwater Elevations - July 2015

Approximate Groundwater Flow Direction

Water Table Elevation Contour

(Dashed in Areas of Less Certainty)

Basemap Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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SCALE: AS SHOWN DRAWN: A Freeman DATE: 9/1/2015

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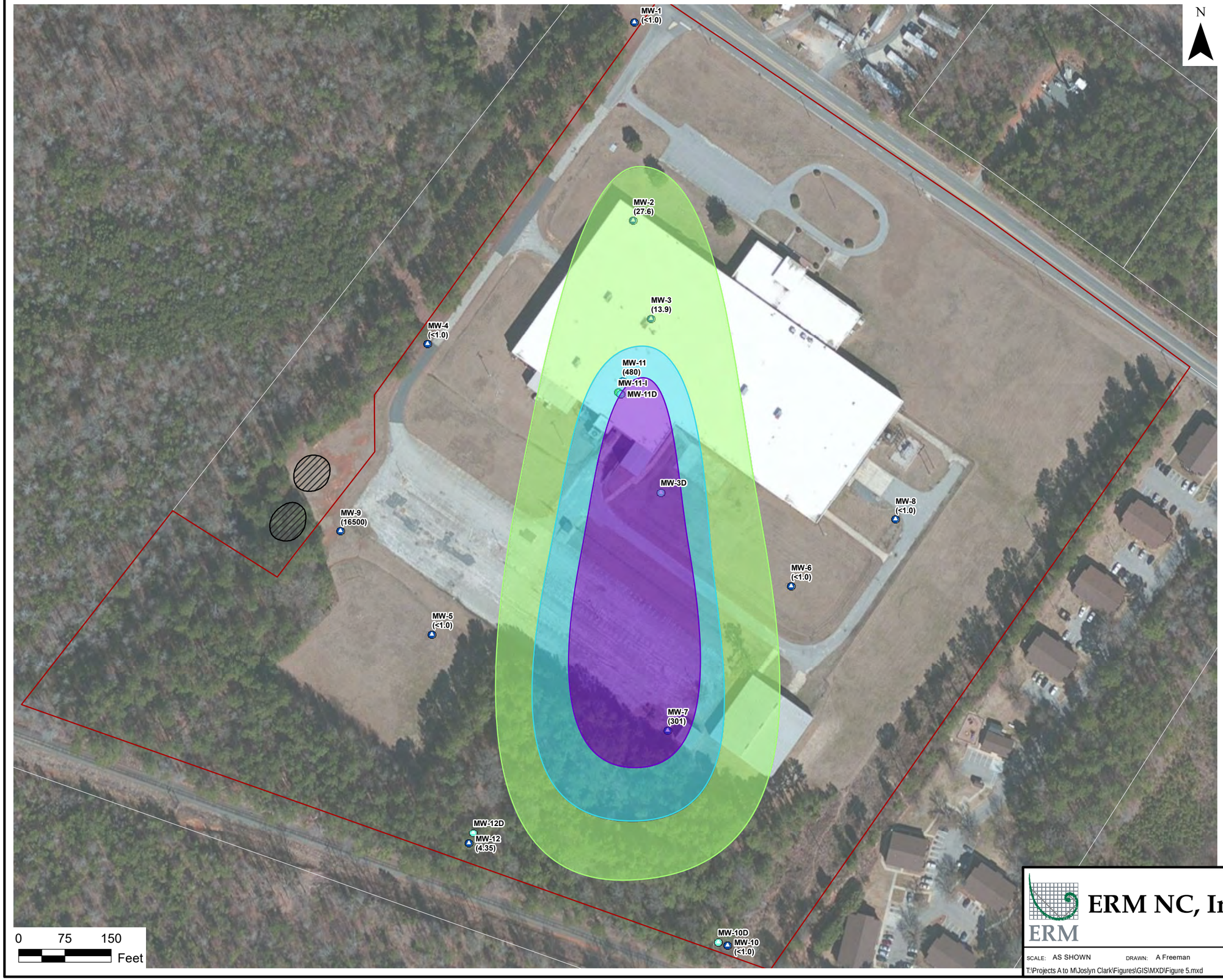
FIGURE 4
Groundwater Flow Map
Deep Aquifer - July 2015
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster, Lancaster County, SC



Legend

- Former Off-Site Lagoons
- Site
- Parcels

Monitor Wells

- Shallow Monitor Well
- Deep Monitor Well
- Intermediate Monitor Well

Trichloroethene (TCE) Concentration July 2015

- 100 ug/L
- 50 ug/L
- 5 ug/L

Basemap Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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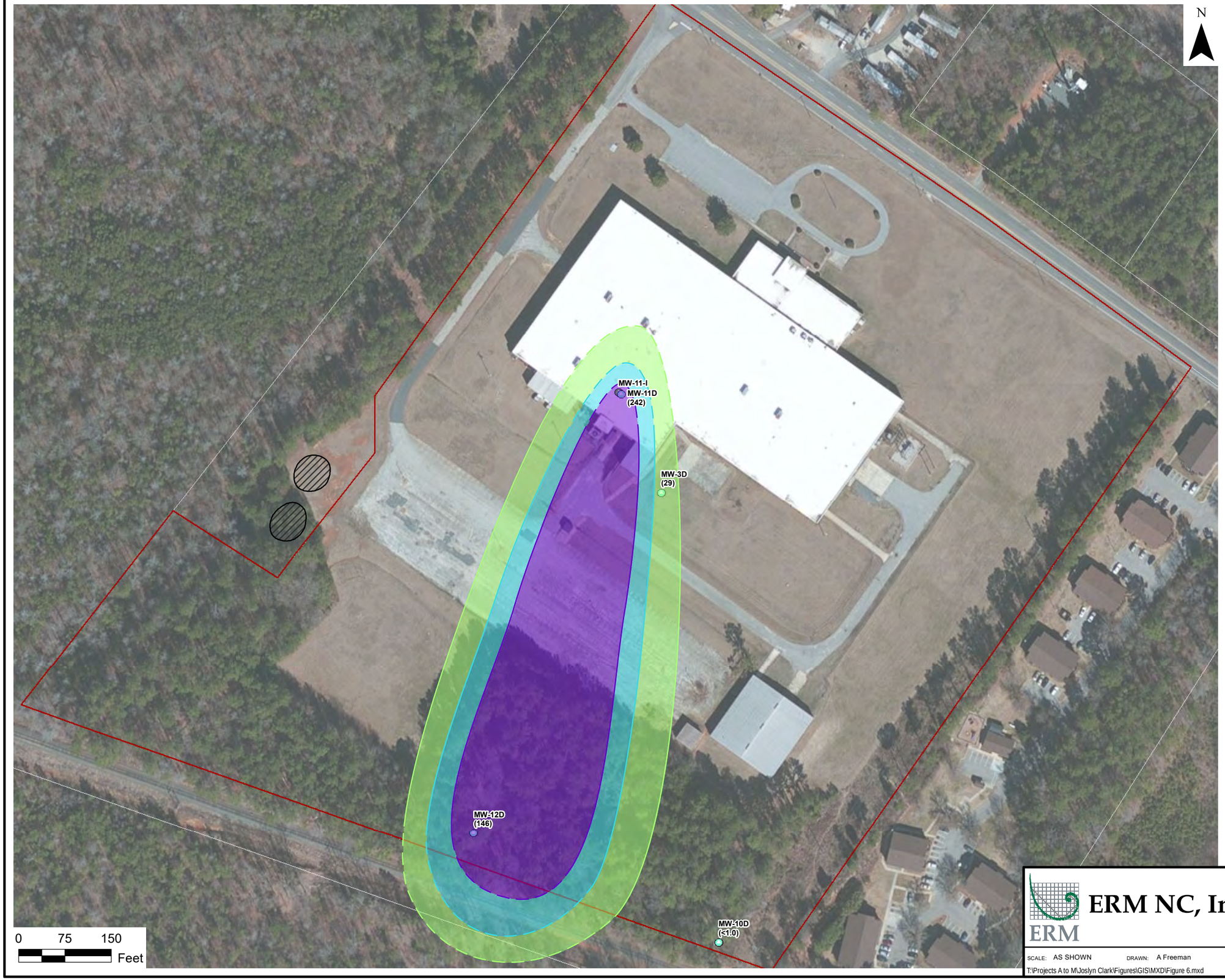
FIGURE 5
TCE Isoconcentration Map
Shallow Groundwater – July 2015
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster, Lancaster County, SC



Legend

- Site
- Parcels
- Former Off-Site Lagoons

Monitor Wells

- Deep Monitor Well
- Intermediate Monitor Well

Trichloroethene (TCE) Concentration July 2015

- 100 ug/L
- 50 ug/L
- 5 ug/L

Dashed contours indicate less certainty

Basemap Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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FIGURE 6
TCE Isoconcentration Map
Deep Groundwater – July 2015
Former Joslyn Clark Facility
2013 W, Meeting Street
Lancaster, Lancaster County, SC

Tables

TABLE 1
SUMMARY OF GEOCHEMICAL PARAMETERS
FORMER JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

Sample ID	Sample Date	Sodium via EPA Method 6010 (mg/L)	Manganese via EPA Method 6010 (mg/L)	Chloride (mg/L)	pH	Specific Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Temperature (˚C)	Oxidation Reduction Potential (mV)
Indicators of ISCO Enhanced Aerobic Attenuation		Increasing	Increasing	Increasing (>2x background)	5 to 9	(Purge Stabilization Parameter)	>5	>20	---
MW-2	05/02/13	6.8	<0.015	10.3	5.35	50	5.91	20.14	105.1
MW-2	10/02/14	7.64	0.00535	10.9	5.46	56	5.74	20.58	193
MW-2	12/29/14	7.21	0.00795	10.3	5.26	48	2.05	18.92	169
MW-2	04/02/15	7	0.0315	8.89	5.62	46	5.66	19.40	134.2
MW-2	07/07/15	7.5	0.0152	11.4	5.65	44	4.86	20.71	130.1
MW-3	05/02/13	8.67	<0.015	8.2	5.95	74	4.34	21.17	150.2
MW-3	10/02/14	58.3	37.8	7.13	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)
MW-3	12/29/14	42.2	43.3	6.77	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)
MW-3	04/02/15	28.4	26.7	6.98	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)
MW-3	07/08/15	26.9	19.3	7.08	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)
OW-1	10/02/14	10.7	2.15	6.81	6.75	86	5.04	22.89	469
OW-1	12/29/14	11.1	0.776	6.93	6.91	91	1.48	22.29	519
OW-1	04/02/15	11.1	1.27	6.25	6.86	89	5.91	20.60	139.5
OW-1	07/08/15	11	1.1	6.76	6.45	78	5.08	21.68	-2.1
MW-11	05/02/13	9.33	0.15	7.08	5.98	61	-	20.56	88
MW-11	06/28/13	NA	NA	NA	5.50	86	4.03	21.83	133
MW-11	07/07/15	NA	NA	NA	5.93	68	4.24	22.70	-2
MW-11I	05/02/13	16	0.079	7.81	6.83	127	-	20.48	-34
MW-11I	06/28/13	NA	NA	NA	5.60	156	5.60	20.86	119
MW-11I	07/07/15	NA	NA	NA	8.70	162	5.19	21.63	-2.2
MW-11D	05/02/13	52.7	0.042	10.2	6.86	123	-	20.38	-35
MW-11D	06/28/13	NA	NA	NA	8.62	437	2.20	20.14	-134
MW-11D	07/07/15	NA	NA	NA	6.96	214	4.56	21.10	-2.1
IW-1A	07/08/15	262	12.10	13.00	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)
IW-1B	07/08/15	624	13.00	17.40	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)
IW-2A	07/08/15	862	2.84	17.90	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)
IW-2B	07/08/15	770	39	28.9	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)	NM ($NaMnO_4$)

Notes:
NA = Not Analyzed
NS = Not Sampled

TABLE 2
GROUNDWATER ELEVATION DATA
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA
PAGE 1 OF 3

Well No.	Top of Casing		Well No.	Top of Casing		Well No.	Top of Casing		Well No.	Top of Casing	
MW-1	Elevation (feet) 547.41		**MW-2**	Elevation (feet) 542.54		**MW-3**	Elevation (feet) 542.52		**MW-3D**	Elevation (feet) 543.15	
Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)
9/30/09	44.54	502.87	9/30/09	42.47	500.07	9/30/09	44.43	498.09			
11/10/11	46.86	500.55	11/10/11	44.02	498.52	11/10/11	45.67	496.85	11/10/11	47.91	495.24
5/3/13	42.29	505.12	5/2/13	44.50	498.04	5/2/13	46.38	496.14	5/2/13	48.30	494.85
07/06/15	42.43	504.98	07/06/15	40.14	502.40	07/06/15	42.49	500.03	07/06/15	44.66	498.49

Well No.	Top of Casing		Well No.	Top of Casing		Well No.	Top of Casing		Well No.	Top of Casing	
MW-4	Elevation (feet) 541.51		**MW-5**	Elevation (feet) 540.63		**MW-6**	Elevation (feet) 542.41		**MW-7**	Elevation (feet) 541.92	
Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)
9/30/09	44.56	496.95	9/30/09	46.59	494.04	9/30/09	49.23	493.18	9/30/09	49.63	492.29
11/10/11	46.47	495.04	11/10/11	47.62	493.01	11/10/11	50.31	492.10	11/10/11	50.72	491.20
5/3/13	46.32	495.19	5/2/13	47.60	493.03	5/3/13	49.83	492.58	5/3/13	50.69	491.23
07/06/15	43.02	498.49	07/06/15	44.51	496.12	7/6/15	46.94	495.47	7/6/15	47.60	494.32

NM = Not Measured; Ft MSL = Feet above Mean Sea Level

TABLE 2
GROUNDWATER ELEVATION DATA
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA
PAGE 2 OF 3

Well No.	Top of Casing Elevation (feet)		Well No.	Top of Casing Elevation (feet)		Well No.	Top of Casing Elevation (feet)		Well No.	Top of Casing Elevation (feet)	
MW-8	539.50		**MW-9**	540.69		**MW-10**	533.20		**MW-10D**	533.05	
Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)
11/10/11	46.91	492.59	11/10/11	48.00	492.69	11/10/11	46.51	486.69	11/10/11	44.56	488.49
5/3/13	46.64	492.86	5/3/13	47.65	493.04	5/3/13	44.32	488.88	5/2/13	44.15	488.90
7/6/15	43.35	496.15	7/6/15	44.90	495.79	7/6/15	41.22	491.98	7/6/15	41.16	491.89

Well No.	Top of Casing Elevation (feet)		Well No.	Top of Casing Elevation (feet)		Well No.	Top of Casing Elevation (feet)		Well No.	Top of Casing Elevation (feet)	
MW-11	542.40		**MW-11I**	542.38		**MW-11D**	542.41		**MW-12**	537.72	
Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)
5/2/13	46.53	495.87	5/2/13	46.54	495.84	5/2/13	46.53	495.88			
7/6/15	42.61	499.79	7/6/15	42.62	499.76	7/6/15	42.55	499.86	7/6/15	43.91	493.81

TABLE 2
GROUNDWATER ELEVATION DATA
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

Well No.	Top of Casing Elevation (feet)		Well No.	Top of Casing Elevation (feet)		Well No.	Top of Casing Elevation (feet)		Well No.	Top of Casing Elevation (feet)	
MW-12D	537.53										
Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)
7/6/15	43.44	494.09									

Well No.	Top of Casing Elevation (feet)		Well No.	Top of Casing Elevation (feet)		Well No.	Top of Casing Elevation (feet)		Well No.	Top of Casing Elevation (feet)	
Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)	Dates:	Water Depth (Ft. BGS)	Water Elevation (Ft. MSL)

TABLE 3
HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
ALL MONITOR WELLS
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

		Volatile Organic Compounds by EPA Method 8260 (µg/L)														
Sample ID	Sample Date	Acetone	2-Butanone (MEK)	Bromodichloromethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	1,1,2-Trichloroethane	Trichloroethene	Dibromochloromethane	Ethylbenzene	Xylene (total)
MW-1	5/3/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2015	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-2	5/2/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**34.5**	<1.0	<1.0	<1.0
	10/2/2014	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**29.7**	<1.00	0.448J	4.21
	12/29/2014	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**24.5**	<1.00	<1.00	<1.00
	4/2/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.53	<1.00	<1.00	**28.1**	<1.00	<1.00	<1.00
	7/7/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**27.6**	<1.00	<1.00	<1.00
MW-3	5/2/2013	<20	<20	<20	<20	<20	**22.4**	<20	<20	<20	**54**	<20	**3,120**	<20	<20	<20
	10/2/2014	56.5	4.56	<1.00	1.73	9.05	<1.00	0.358J	<1.00	<1.00	0.533J	1.54	**7.25**	<1.00	<1.00	<1.00
	12/29/2014	51.5	3.63	<1.00	1.8	9.08	<1.00	<1.00	<1.00	<1.00	<1.00	1.9	**3.51**	<1.00	<1.00	<1.00
	4/2/2015	35.2	1.2	<1.00	1.29	6.79	<1.00	<1.00	<1.00	2.3	<1.00	1.02	**2.25**	<1.00	<1.00	<1.00
	7/8/2015	15.2	<1.00	<1.00	1.16	5.79	<1.00	0.381J	<1.00	<1.00	0.504J	1.08	**13.9**	<1.00	<1.00	0.418J
MW-3D	5/2/2013	<1.0	<1.0	<1.0	<1.0	<1.0	2.11	<1.0	<1.0	<1.0	<1.0	<1.0	**39.7**	<1.0	<1.0	<1.0
	7/7/2015	<1.0	<1.0	<1.0	0.566J	<1.0	3.88	<1.0	<1.0	<1.0	0.827J	<1.0	**29**	<1.0	<1.0	<1.0
MW-4	5/3/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MW-5	5/2/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MW-6	5/3/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**6.83**	<1.0	<1.0	<1.0
	7/7/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	0.867J	<1.00	<1.00	<1.00
MW-7	5/3/2013	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**9.27**	<5.0	**366**	<5.0	<5.0	<5.0
	7/7/2015	<2.00	<2.00	<2.00	2.7	<2.00	<2.00	<2.00	5.51	<2.00	**11.8**	<2.00	**364**	<2.00	<2.00	<2.00
MW-8	5/3/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/7/2015	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	0.360J	<1.00	<1.00	<1.00
Regional Screening Level - Tapwater		14000	5600	0.13	0.22	2.7	280	0.17	36	11.4	11	0.28	0.49	0.17	1.5	190
MCL		NE	NE	80	80	NE	7	5	70	5	5	5	5	80	700	10000

Notes:

BOLD values indicate an exceedence of EPA MCLs, June 2015
ug/l = Micrograms/liter; All analytical results expressed in ug/L
B = Detected in Method blank
J = Less than practical quantification level but equal to or greater than minimum detection limit
EPA = Environmental Protection Agency
MCL = Maximum Contaminant Level
ND = Not Detected; NA=Not analyzed; NE = Not Established; N/A = Not applicable
SVOC = semi-volatile organic compound; SVOC analyses by EPA Method 8270C
* = 80 ug/L is the MCL for all combined halomethanes

TABLE 3
HISTORICAL GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS
ALL MONITOR WELLS
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

		Volatile Organic Compounds by EPA Method 8260 (µg/L)														
Sample ID	Sample Date	Acetone	2-Butanone (MEK)	Bromodichloromethane	Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	cis-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	1,1,2-Trichloroethane	Trichloroethene	Dibromochloromethane	Ethylbenzene	Xylene (total)
MW-9	05/03/13	<200	<200	<200	<200	<200	**303**	<200	**249**	<200	**1,360**	<200	**16,900**	<200	<200	<200
	07/08/15	<100	<100	<100	56.5J	<100	**216**	<100	**459**	<100	**1,000**	<100	**16,500**	<100	<100	<100
MW-10	05/03/13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	07/07/15	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	0.916J	<1.00	<1.00	<1.00
MW-10D	05/02/13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	07/07/15	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MW-11	05/02/13	<5.0	<5.0	<5.0	<5.0	<5.0	**155**	<5.0	<5.0	<5.0	**34.5**	<5.0	**951**	<5.0	<5.0	<5.0
	06/26/13	<5.0	<5.0	<5.0	<5.0	<5.0	**87.1**	<5.0	64.8	<5.0	**12**	<5.0	**394**	<5.0	<5.0	<5.0
	07/07/15	<5.00	<5.00	<5.00	<5.00	<5.00	**105**	<5.00	11.1	<5.00	**22.8**	<5.00	**480**	<5.00	<5.00	<5.00
MW-11I	05/02/13	<1.0	<1.0	<1.0	<1.0	<1.0	1.66	<1.0	<1.0	1.73	<1.0	<1.0	**131**	<1.0	<1.0	<1.0
	06/26/13	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	**213**	<2.0	<2.0	<2.0
	07/07/15	<2.00	<2.00	<2.00	<2.00	<2.00	0.947J	<2.00	<2.00	<2.00	1.21J	<2.00	**204**	<2.00	<2.00	<2.00
MW-11D	05/02/13	3.11	<1.0	<1.0	1.15	<1.0	<1.0	<1.0	<1.0	1.23	<1.0	<1.0	**97.9**	<1.0	<1.0	<1.0
	06/26/13	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	**167**	<2.0	<2.0	<2.0
	07/07/15	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	1.16J	<2.00	**242**	<2.00	<2.00	<2.00
MW-12	07/06/15	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	0.418J	<1.00	4.35	<1.00	<1.00	<1.00
MW-12D	07/06/15	<1.00	<1.00	<1.00	0.632J	<1.00	**12.3**	0.905J	3.81	<1.00	16.2	<1.00	**146**	<1.00	<1.00	<1.00
OW-1	10/02/14	<5.00	<5.00	<5.00	<5.00	7.14	5.26	<5.00	<5.00	4.71J	**10.1**	<5.00	**650**	<5.00	<5.00	<5.00
	12/29/14	<5.00	<5.00	<5.00	<5.00	8.58	3.14J	<5.00	<5.00	<5.00	**15.7**	<5.00	**493**	<5.00	<5.00	<5.00
	04/02/15	<5.00	<5.00	<5.00	<5.00	7.64	3.09J	<5.00	<5.00	**5.58**	**15.1**	<5.00	**392**	<5.00	<5.00	<5.00
	07/08/15	<5.00	<5.00	<5.00	<5.00	6.29	<5.00	<5.00	1.86J	<5.00	**12.7**	<5.00	**514**	<5.00	<5.00	<5.00
IW-1A	07/08/15	<1.0	<1.0	0.348J	0.829J	1.44	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
IW-1B	07/08/15	<1.0	<1.0	<1.0	1.03	1.19	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
IW-2A	07/08/15	<1.0	<1.0	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
IW-2B	07/08/15	8.44	<1.0	0.631J	1.33	0.786J	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.275J	<1.00	<1.00
GP-18	04/09/13	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	**696**	<10	<10	<10
Regional Screening Level - Tapwater		14,000	5,600	0.13	0.22	2.7	280	0.17	36	11.4	11	0.28	0.49	0.17	1.5	190
MCL		NE	NE	80	80	NE	7	5	70	5	5	5	5	80	700	10000

Notes:

BOLD values indicate an exceedence of EPA MCLs, June 2015
ug/l = Micrograms/liter; All analytical results expressed in ug/L
B = Detected in Method blank
J = Less than practical quantification level but equal to or greater than minimum detection limit
EPA = Environmental Protection Agency
MCL = Maximum Contaminant Level
ND = Not Detected; NA=Not analyzed; NE = Not Established; N/A = Not applicable
SVOC = semi-volatile organic compound; SVOC analyses by EPA Method 8270C
* = 80 ug/L is the MCL for all combined halomethanes

Table 4
QUALITY ASSURANCE ANALYSIS SUMMARY
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

Sample ID	Date Collected	Volatile Organic Compounds by EPA Method 8260 (µg/L)					
		Chloroform	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene
EPA Region 9 PRGs - Tapwater		0.22	2.7	280	36	11	0.49
EPA Region 9 PRGs - MCLs		80	NE	7	70	5	5
Bias Analysis		*Data is Considered Valid*					
Eq-Rinse-1	7/7/2015	<1	<1	<1	<1	<1	<1
EQ-Rinse-2	7/8/2015	<1	<1	<1	<1	<1	<1
Trip Blank	7/8/2015	<1	<1	<1	<1	<1	<1
Review of the results of the trip and field blank sample analyses indicate no sources of error from the sample collection, handling, and preservation procedures.							
Completeness Analysis		*Data is Considered Valid*					
Review of the dataset for this project indicate that an adequate number of monitoring locations exist to define and monitor the plume. Samples were collected from all active monitoring points containing sufficient groundwater to allow sample collection.							
Comparability Analysis		*Data is Considered Valid*					
Review of the dataset for this project indicate that results for each sample were analyzed using the same methods and are presented using consistent units.							
Precision Analysis		*Data is Considered Valid*					
MW-7	7/7/2015	2.70	<2	<2	5.51	8.83	**301**
MW-7 Dup (Dup-1)	7/7/2015	2.65	<2	<2	6.10	**11.80**	**364**
Calculated RPD		2%	0%	0%	10%	29%	19%
MW-11	7/7/2015	<5	<5	**105**	11.1	**22.8**	**480**
MW-11 Dup (Dup-2)	7/7/2015	<5	<5	83.3	10.6	**19.7**	**455**
Calculated RPD		0%	0%	23%	5%	15%	5%
Calculated RPDs <20% are preferred. The only RPD greater than 20% was for tetrachloroethene in the MW-7 duplicate and 1,1-dichloroethene in the sample (the higher values were used).							
Sensitivity Analysis		*Data is Considered Valid*					
The detection limits listed for each analyte are less than or equal to the respective applicable regulatory limit. No exceptions due to dilution of samples were noted.							

Bold data are equal to or exceed RBSLs

Appendix A
Laboratory Analytical Data Sheets

Appendix A-1
90-Day Monitoring Event

ANALYTICAL RESULTS

PERFORMED BY

GCAL, LLC
7979 Innovation Park Dr.
Baton Rouge, LA 70820

Report Date 08/31/2015

GCAL Report 214100341

Project Joslyn Clark

Deliver To
Michael Pressley
ERM NC, Inc
15720 Brixham Hill Avenue
Suite 120
Charlotte, NC 28277
704 409 3450

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
DL	Diluted analysis – when appended to Client Sample ID
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
N	Metals Matrix Spike or Matrix Spike Duplicate Recovery is outside control limits
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____
Authorized Signature
GCAL Report 214100341

Case Narrative

Client: ERM NC, INC **Report:** 214100341

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the sample cross-reference page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was revised 08/31/15. The data is revised to report non-detects as LOQ U. Additionally J values are not reported.

VOLATILES MASS SPECTROMETRY

In the EPA 8260B analysis, samples 21410034102 (OW-1 (VITC)) and 21410034101 (OW-1 (AA)) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. The dilution is reflected in elevated detection limits.

In the EPA 8260B analysis for analytical batch 542344, the LCS/LCSD RPD is above the control limit for Toluene.

METALS

In the EPA 6020A analysis, samples 21410034104 (MW-3 (AA)) and 21410034101 (OW-1) had to be diluted in order to bracket the concentration within the calibration range of the instrument.

In the EPA 6020A analysis for prep batch 542328, the MS/MSD recoveries are not applicable for Manganese and Sodium because the sample concentration is greater than four times the spike concentration.

CONVENTIONALS

In the EPA 300.0 analysis, samples 21410034101 (OW-1), 21410034103 (MW-2) and 21410034104 (MW-3) had to be diluted in order to bracket the concentration within the calibration range of the instrument.

Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21410034101	OW-1	Water	10/02/2014 13:30	10/03/2014 10:45
21410034102	OW-1	Water	10/02/2014 13:30	10/03/2014 10:45
21410034103	MW-2	Water	10/02/2014 12:05	10/03/2014 10:45
21410034104	MW-3	Water	10/02/2014 14:00	10/03/2014 10:45
21410034105	MW-3	Water	10/02/2014 14:00	10/03/2014 10:45
21410034106	TRIP BLANK	Water	10/02/2014 00:00	10/03/2014 10:45

Summary of Compounds Detected

OW-1

Collect Date 10/02/2014 13:30 **GCAL ID** 21410034101
Receive Date 10/03/2014 10:45 **Matrix** Water

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	2150	25.0	ug/L
7440-23-5	Sodium	10700	500	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	6.81	2.00	mg/L

OW-1

Collect Date 10/02/2014 13:30 **GCAL ID** 21410034102
Receive Date 10/03/2014 10:45 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
75-34-3	1,1-Dichloroethane	7.14	5.00	ug/L
75-35-4	1,1-Dichloroethene	5.26	5.00	ug/L
79-20-9	Methyl Acetate	15.3	5.00	ug/L
127-18-4	Tetrachloroethene	10.1	5.00	ug/L
79-01-6	Trichloroethene	650	5.00	ug/L

MW-2

Collect Date 10/02/2014 12:05 **GCAL ID** 21410034103
Receive Date 10/03/2014 10:45 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
79-01-6	Trichloroethene	29.7	1.00	ug/L
1330-20-7	Xylene (total)	4.21	1.00	ug/L

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	5.35	5.00	ug/L

Summary of Compounds Detected

MW-2

Collect Date: 10/02/2014 12:05
Receive Date: 10/03/2014 10:45
GCAL ID: 21410034103
Matrix: Water

EPA 6020A (Continued)

CAS#	Parameter	Result	LOQ	Units
7440-23-5	Sodium	7640	100	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	10.9	1.00	mg/L

MW-3

Collect Date: 10/02/2014 14:00
Receive Date: 10/03/2014 10:45
GCAL ID: 21410034104
Matrix: Water

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	37800	500	ug/L
7440-23-5	Sodium	58300	10000	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	7.13	0.400	mg/L

MW-3

Collect Date: 10/02/2014 14:00
Receive Date: 10/03/2014 10:45
GCAL ID: 21410034105
Matrix: Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
79-00-5	1,1,2-Trichloroethane	1.54	1.00	ug/L
75-34-3	1,1-Dichloroethane	9.05	1.00	ug/L
78-93-3	2-Butanone	4.56	1.00	ug/L
67-64-1	Acetone	56.5	1.00	ug/L
67-66-3	Chloroform	1.73	1.00	ug/L
79-20-9	Methyl Acetate	9.36	1.00	ug/L
79-01-6	Trichloroethene	7.25	1.00	ug/L

Sample Results

OW-1

Collect Date	10/02/2014 13:30	**GCAL ID**	21410034101
Receive Date	10/03/2014 10:45	**Matrix**	Water

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
10/06/2014 10:00	542328	EPA 3010A	5	10/08/2014 21:16	BAM	542640

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**2150**	**25.0**	**ug/L**
7440-23-5	**Sodium**	**10700**	**500**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	10	10/07/2014 19:42	JEM	542415

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**6.81**	**2.00**	**mg/L**

OW-1

Collect Date	10/02/2014 13:30	**GCAL ID**	21410034102
Receive Date	10/03/2014 10:45	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	10/04/2014 16:04	ALC2	542344

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	5.00 U	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	5.00 U	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	5.00 U	5.00	ug/L
75-34-3	**1,1-Dichloroethane**	**7.14**	**5.00**	**ug/L**
75-35-4	**1,1-Dichloroethene**	**5.26**	**5.00**	**ug/L**
120-82-1	1,2,4-Trichlorobenzene	5.00 U	5.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	5.00 U	5.00	ug/L
106-93-4	1,2-Dibromoethane	5.00 U	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	5.00 U	5.00	ug/L
107-06-2	1,2-Dichloroethane	5.00 U	5.00	ug/L
78-87-5	1,2-Dichloropropane	5.00 U	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	5.00 U	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	5.00 U	5.00	ug/L
78-93-3	2-Butanone	5.00 U	5.00	ug/L
591-78-6	2-Hexanone	5.00 U	5.00	ug/L
108-10-1	4-Methyl-2-pentanone	5.00 U	5.00	ug/L
67-64-1	Acetone	5.00 U	5.00	ug/L
71-43-2	Benzene	5.00 U	5.00	ug/L
75-27-4	Bromodichloromethane	5.00 U	5.00	ug/L
75-25-2	Bromoform	5.00 U	5.00	ug/L
74-83-9	Bromomethane	5.00 U	5.00	ug/L

Sample Results

OW-1	**Collect Date**	10/02/2014 13:30	**GCAL ID**	21410034102
	Receive Date	10/03/2014 10:45	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	10/04/2014 16:04	ALC2	542344

CAS#	Parameter	Result	LOQ	Units
75-15-0	Carbon disulfide	5.00 U	5.00	ug/L
56-23-5	Carbon tetrachloride	5.00 U	5.00	ug/L
108-90-7	Chlorobenzene	5.00 U	5.00	ug/L
75-00-3	Chloroethane	5.00 U	5.00	ug/L
67-66-3	Chloroform	5.00 U	5.00	ug/L
74-87-3	Chloromethane	5.00 U	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	5.00 U	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	5.00 U	5.00	ug/L
110-82-7	Cyclohexane	5.00 U	5.00	ug/L
124-48-1	Dibromochloromethane	5.00 U	5.00	ug/L
75-71-8	Dichlorodifluoromethane	5.00 U	5.00	ug/L
100-41-4	Ethylbenzene	5.00 U	5.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	5.00 U	5.00	ug/L
79-20-9	**Methyl Acetate**	**15.3**	**5.00**	**ug/L**
108-87-2	Methylcyclohexane	5.00 U	5.00	ug/L
75-09-2	Methylene chloride	5.00 U	5.00	ug/L
100-42-5	Styrene	5.00 U	5.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	5.00 U	5.00	ug/L
127-18-4	**Tetrachloroethene**	**10.1**	**5.00**	**ug/L**
108-88-3	Toluene	5.00 U	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	5.00 U	5.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	5.00 U	5.00	ug/L
79-01-6	**Trichloroethene**	**650**	**5.00**	**ug/L**
75-69-4	Trichlorofluoromethane	5.00 U	5.00	ug/L
76-13-1	Trichlorotrifluoroethane	5.00 U	5.00	ug/L
75-01-4	Vinyl chloride	5.00 U	5.00	ug/L
1330-20-7	Xylene (total)	5.00 U	5.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	250	224	ug/L	90	78 - 130
1868-53-7	Dibromofluoromethane	250	267	ug/L	107	77 - 127
2037-26-5	Toluene d8	250	261	ug/L	104	76 - 134
17060-07-0	1,2-Dichloroethane-d4	250	278	ug/L	111	71 - 127

Sample Results

MW-2	**Collect Date**	10/02/2014 12:05	**GCAL ID**	21410034103
	Receive Date	10/03/2014 10:45	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	10/04/2014 11:09	ALC2	542344

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	**Trichloroethene**	**29.7**	**1.00**	**ug/L**
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

MW-2

Collect Date	10/02/2014 12:05	**GCAL ID**	21410034103
Receive Date	10/03/2014 10:45	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	10/04/2014 11:09	ALC2	542344

CAS#	Parameter	Result	LOQ	Units
1330-20-7	**Xylene (total)**	**4.21**	**1.00**	**ug/L**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	46.7	ug/L	93	78 - 130
1868-53-7	Dibromofluoromethane	50	51.9	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	52	ug/L	104	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52.1	ug/L	104	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
10/06/2014 10:00	542328	EPA 3010A	1	10/08/2014 21:21	BAM	542640

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**5.35**	**5.00**	**ug/L**
7440-23-5	**Sodium**	**7640**	**100**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	10/07/2014 20:00	JEM	542415

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**10.9**	**1.00**	**mg/L**

MW-3

Collect Date	10/02/2014 14:00	**GCAL ID**	21410034104
Receive Date	10/03/2014 10:45	**Matrix**	Water

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
10/06/2014 10:00	542328	EPA 3010A	100	10/07/2014 16:36	BAM	542488

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**37800**	**500**	**ug/L**

Sample Results

MW-3

Collect Date	10/02/2014 14:00	**GCAL ID**	21410034104
Receive Date	10/03/2014 10:45	**Matrix**	Water

EPA 6020A (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
10/06/2014 10:00	542328	EPA 3010A	100	10/07/2014 16:36	BAM	542488

CAS#	Parameter	Result	LOQ	Units
7440-23-5	**Sodium**	**58300**	**10000**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	10/08/2014 12:12	JEM	542415

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**7.13**	**0.400**	**mg/L**

MW-3

Collect Date	10/02/2014 14:00	**GCAL ID**	21410034105
Receive Date	10/03/2014 10:45	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	10/04/2014 11:49	ALC2	542344

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	**1,1,2-Trichloroethane**	**1.54**	**1.00**	**ug/L**
75-34-3	**1,1-Dichloroethane**	**9.05**	**1.00**	**ug/L**
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	**2-Butanone**	**4.56**	**1.00**	**ug/L**
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	**Acetone**	**56.5**	**1.00**	**ug/L**
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L

Sample Results

MW-3

Collect Date 10/02/2014 14:00 **GCAL ID** 21410034105
Receive Date 10/03/2014 10:45 **Matrix** Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	10/04/2014 11:49	ALC2	542344

CAS#	Parameter	Result	LOQ	Units
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	**Chloroform**	**1.73**	**1.00**	**ug/L**
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	**Methyl Acetate**	**9.36**	**1.00**	**ug/L**
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	**Trichloroethene**	**7.25**	**1.00**	**ug/L**
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	44.8	ug/L	90	78 - 130
1868-53-7	Dibromofluoromethane	50	52.5	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	51.4	ug/L	103	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52.4	ug/L	105	71 - 127

TRIP BLANK

Collect Date 10/02/2014 00:00 **GCAL ID** 21410034106
Receive Date 10/03/2014 10:45 **Matrix** Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	10/04/2014 12:09	ALC2	542344

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L

Sample Results

TRIP BLANK	**Collect Date**	10/02/2014 00:00	**GCAL ID**	21410034106
	Receive Date	10/03/2014 10:45	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	10/04/2014 12:09	ALC2	542344

CAS#	Parameter	Result	LOQ	Units
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

TRIP BLANK	**Collect Date**	10/02/2014 00:00	**GCAL ID**	21410034106
	Receive Date	10/03/2014 10:45	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	10/04/2014 12:09	ALC2	542344

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	45.6	ug/L	91	78 - 130
1868-53-7	Dibromofluoromethane	50	52.5	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	51.9	ug/L	104	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	53.1	ug/L	106	71 - 127

GC/MS Volatiles QC Summary

Analytical Batch 542344	Client ID	MB542344		LCS542344				LCSD542344				
	GCAL ID	1366260		1366261				1366262				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	10/04/2014 10:49		10/04/2014 08:33				10/04/2014 09:30				
	Matrix	Water		Water				Water				
EPA 8260B		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,1,1-Trichloroethane	71-55-6	1.00U	1.00	50.0	56.9	114	76 - 126	50.0	55.2	110	3	30
1,1,2,2-Tetrachloroethane	79-34-5	1.00U	1.00	50.0	58.5	117	70 - 122	50.0	55.3	111	6	30
1,1,2-Trichloroethane	79-00-5	1.00U	1.00	50.0	53.5	107	72 - 121	50.0	53.6	107	0	30
1,1-Dichloroethane	75-34-3	1.00U	1.00	50.0	59.1	118	74 - 127	50.0	57.8	116	2	30
1,1-Dichloroethene	75-35-4	1.00U	1.00	50.0	53.3	107	69 - 129	50.0	51.7	103	3	20
1,2,4-Trichlorobenzene	120-82-1	1.00U	1.00	50.0	52.4	105	61 - 135	50.0	52.3	105	0	30
1,2-Dibromo-3-chloropropane	96-12-8	1.00U	1.00	50.0	51.7	103	57 - 121	50.0	44.8	90	14	30
1,2-Dibromoethane	106-93-4	1.00U	1.00	50.0	54.0	108	70 - 124	50.0	53.5	107	1	30
1,2-Dichlorobenzene	95-50-1	1.00U	1.00	50.0	56.1	112	71 - 126	50.0	56.1	112	0	30
1,2-Dichloroethane	107-06-2	1.00U	1.00	50.0	53.8	108	71 - 129	50.0	52.4	105	3	30
1,2-Dichloropropane	78-87-5	1.00U	1.00	50.0	57.1	114	72 - 128	50.0	55.8	112	2	30
1,3-Dichlorobenzene	541-73-1	1.00U	1.00	50.0	57.5	115	74 - 126	50.0	57.2	114	1	30
1,4-Dichlorobenzene	106-46-7	1.00U	1.00	50.0	54.6	109	72 - 122	50.0	54.0	108	1	30
2-Butanone	78-93-3	1.00U	1.00	50.0	56.7	113	58 - 137	50.0	51.3	103	10	30
2-Hexanone	591-78-6	1.00U	1.00	50.0	54.7	109	50 - 135	50.0	48.3	97	12	30
4-Methyl-2-pentanone	108-10-1	1.00U	1.00	50.0	53.9	108	57 - 132	50.0	46.6	93	15	30
Acetone	67-64-1	1.00U	1.00	50.0	56.0	112	44 - 156	50.0	49.6	99	12	30
Benzene	71-43-2	1.00U	1.00	50.0	56.9	114	70 - 129	50.0	56.4	113	1	20
Bromodichloromethane	75-27-4	1.00U	1.00	50.0	57.5	115	74 - 125	50.0	56.3	113	2	30
Bromoform	75-25-2	1.00U	1.00	50.0	53.2	106	64 - 122	50.0	52.2	104	2	30
Bromomethane	74-83-9	1.00U	1.00	50.0	53.1	106	47 - 138	50.0	53.4	107	1	30
Carbon disulfide	75-15-0	1.00U	1.00	50.0	52.9	106	69 - 136	50.0	51.7	103	2	30
Carbon tetrachloride	56-23-5	1.00U	1.00	50.0	55.7	111	76 - 128	50.0	55.0	110	1	30
Chlorobenzene	108-90-7	1.00U	1.00	50.0	54.1	108	74 - 123	50.0	54.8	110	1	20
Chloroethane	75-00-3	1.00U	1.00	50.0	53.1	106	62 - 141	50.0	51.5	103	3	30
Chloroform	67-66-3	1.00U	1.00	50.0	57.1	114	75 - 122	50.0	56.5	113	1	30
Chloromethane	74-87-3	1.00U	1.00	50.0	60.9	122	59 - 132	50.0	58.7	117	4	30
cis-1,2-Dichloroethene	156-59-2	1.00U	1.00	50.0	56.0	112	73 - 130	50.0	54.9	110	2	30
cis-1,3-Dichloropropene	10061-01-5	1.00U	1.00	50.0	57.9	116	71 - 132	50.0	57.0	114	2	30
Cyclohexane	110-82-7	1.00U	1.00	50.0	61.8	124	69 - 132	50.0	61.1	122	1	30
Dibromochloromethane	124-48-1	1.00U	1.00	50.0	54.9	110	71 - 123	50.0	54.2	108	1	30
Dichlorodifluoromethane	75-71-8	1.00U	1.00	50.0	54.8	110	58 - 140	50.0	53.5	107	2	30
Ethylbenzene	100-41-4	1.00U	1.00	50.0	55.6	111	74 - 126	50.0	56.6	113	2	30
Isopropylbenzene (Cumene)	98-82-8	1.00U	1.00	50.0	57.3	115	71 - 125	50.0	57.7	115	1	30
Methyl Acetate	79-20-9	1.00U	1.00	50.0	58.7	117	57 - 139	50.0	55.8	112	5	30
Methylcyclohexane	108-87-2	1.00U	1.00	50.0	60.7	121	67 - 138	50.0	59.2	118	3	30
Methylene chloride	75-09-2	1.00U	1.00	50.0	56.1	112	68 - 132	50.0	54.7	109	3	30
Styrene	100-42-5	1.00U	1.00	50.0	51.2	102	71 - 127	50.0	50.5	101	1	30
tert-Butyl methyl ether (MTBE)	1634-04-4	1.00U	1.00	50.0	54.2	108	71 - 125	50.0	52.2	104	4	30
Tetrachloroethene	127-18-4	1.00U	1.00	50.0	54.6	109	68 - 128	50.0	55.4	111	1	30
Toluene	108-88-3	1.00U	1.00	50.0	52.4	105	72 - 120	50.0	39.3	79	**29***	20
trans-1,2-Dichloroethene	156-60-5	1.00U	1.00	50.0	58.3	117	69 - 132	50.0	57.0	114	2	30
trans-1,3-Dichloropropene	10061-02-6	1.00U	1.00	50.0	58.4	117	71 - 131	50.0	55.5	111	5	30
Trichloroethene	79-01-6	1.00U	1.00	50.0	57.7	115	76 - 129	50.0	56.3	113	2	20
Trichlorofluoromethane	75-69-4	1.00U	1.00	50.0	55.4	111	72 - 136	50.0	53.1	106	4	30
Trichlorotrifluoroethane	76-13-1	1.00U	1.00	50.0	55.2	110	72 - 136	50.0	53.6	107	3	30
Vinyl chloride	75-01-4	1.00U	1.00	50.0	57.8	116	68 - 132	50.0	55.7	111	4	30
Xylene (total)	1330-20-7	1.00U	1.00	150	168	112	74 - 127	150	170	113	1	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	51.7	103	50	50.7	101	71 - 127	50	50.2	100	1	NA
4-Bromofluorobenzene	460-00-4	45.2	90	50	46.5	93	78 - 130	50	47.2	94	1	NA
Dibromofluoromethane	1868-53-7	50.6	101	50	51	102	77 - 127	50	49.8	100	2	NA
Toluene d8	2037-26-5	51.3	103	50	47.9	96	76 - 134	50	49.3	99	3	NA

Inorganics QC Summary

Analytical Batch	Client ID	MB542328		LCS542328			
542488	GCAL ID	1366199		1366200			
Prep Batch	Sample Type	MB		LCS			
542328	Prep Date	10/06/2014 10:00		10/06/2014 10:00			
Prep Method	Analysis Date	10/07/2014 15:57		10/07/2014 16:04			
EPA 3010A	Matrix	Water		Water			
EPA 6020A		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R
Manganese	7439-96-5	5.00U	5.00	50.0	49.4	99	80 - 120
Sodium	7440-23-5	100U	100	5000	5110	102	80 - 120

Analytical Batch	Client ID	MW-6U		1366182MS				1366182MSD				
542488	GCAL ID	21410034504		1366201				1366202				
Prep Batch	Sample Type	SAMPLE		MS				MSD				
542328	Prep Date	10/06/2014 10:00		10/06/2014 10:00				10/06/2014 10:00				
Prep Method	Analysis Date	10/07/2014 18:04		10/07/2014 18:11				10/07/2014 18:19				
EPA 3010A	Matrix	Water		Water				Water				
EPA 6020A		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Manganese	7439-96-5	8240	5.00	50.0	7490	**-1500***	80 - 120	50.0	7760	**-959***	4	20
Sodium	7440-23-5	37100	100	5000	38000	**19***	80 - 120	5000	39300	**43***	3	20

General Chemistry QC Summary

Analytical Batch 542415	Client ID	MB542415		LCS542415			
	GCAL ID	1366515		1366516			
	Sample Type	MB		LCS			
	Prep Date	NA		NA			
	Analysis Date	10/07/2014 17:04		10/07/2014 16:46			
	Matrix	Water		Water			
EPA 300.0, Rev 2.1		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R
Chloride	16887-00-6	0.200U	0.200	2.50	2.63	105	80 - 120

GCAL
ANALYTICAL LABORATORIES, LLC

7979 Innovation Park Dr., Baton Rouge, LA 70820-7402
Phone: 225.769.4900 • Fax: 225.767.5717 • www.gcal.com

CHAIN OF CUSTODY RECORD

Client ID: 4783 - ERM NC, INC
SDG: 214100341
Due Date: 10/09/14

Report to:	Bill to:
Client: ERM NC, Inc	Client: Same as Rpt To
Address: 15720 Brixham Hill Ave Ste 120, Charlotte, NC 28277	Address:
Contact: Michael Pressley	Contact:
Phone: 704-541-8345	Phone:
E-mail: Michael.Pressley@erm.com	E-mail:

P.O. Number:
Project Name/Number: Joslyn Clark/ 237244.01
Sampled By: Thomas Fisher

Analytical Requests & Method: 8260 - VOC (HCl Absorbic); 6010 - Na, Mn (HNO3); 300.0 - Cl (None)

GCAL use only: 241445, 3
Custody Seal used ☑ yes ☐ no
intact ☑ yes ☐ no
Temperature °C 4.1 E24

☐ Dissolved Analysis Requested
☐ Field filtered
☐ Lab filtered

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No Containers	8260 - VOC	6010 - Na, Mn	300.0 - Cl		Preservative
W	10/2/14	1330		X	OW-1	11	X	X	X	1, 2	VOC samples
W	10/2/14	1205		X	MW-2	5	X	X	X	3	preserved w/
W	10/2/14	1400		X	MW-3	11	X	X	X	4 5	crushed vitamin-C
W	-	-	-	X	Trip Blank	3	X			6	HCl, Absorbic acid

Air Bill No: 5980 9379 6175

Turn Around Time (Business Days): ☐ 24h* ☐ 48h* ☐ 3 days* ☐ 1 week* ☑ Standard (Per Contract/Quote)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
[signature]	10/2/14	1600			
FedEx	10/3/14	1045	[signature]	10/3/14	1045

Note:

By submitting these samples, you agree to GCAL's terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = solid, L = liquid, T = tissue

*Requires prior approval, rush charges may apply.

We cannot accept verbal changes. Please email written changes to your PM.

WHITE: CLIENT FINAL REPORT - CANARY: CLIENT

Revision 1

GCAL
ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

214100341

SAMPLE DELIVERY GROUP 214100341	
Client 4783 - ERM NC, INC	**Transport Method** FEDEX
Profile Number 241445	**Received By** Saucier, Charlotte M.
Line Item(s) 3 - Water - VOC/Na,Mn/Cl	**Receive Date(s)** 10/03/14

CHECKLIST	YES	NO	NA
Were all samples received using proper thermal preservation?	☑	☐	☐
When used, were all custody seals intact?	☑	☐	☐
Were all samples received in proper containers?	☑	☐	☐
Were all samples received using proper chemical preservation?	☑	☐	☐
Was preservative added to any container at the lab?	☐	☑	☐
Were all containers received in good condition?	☑	☐	☐
Were all VOA vials received with no head space?	☑	☐	☐
Do all sample labels match the Chain of Custody?	☑	☐	☐
Did the Chain of Custody list the sampling technician?	☑	☐	☐
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☐	☑	☐

COOLERS

Airbill	Thermometer ID: E24	Temp(°C)
5980 9379 6178		4.1

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.4

Page 1 of 1

Appendix A-2
180-Day Monitoring Event

ANALYTICAL RESULTS

PERFORMED BY

GCAL, LLC
7979 Innovation Park Dr.
Baton Rouge, LA 70820

Report Date 08/31/2015

GCAL Report 214123017

Project Joslyn Clark

Deliver To
Michael Pressley
ERM NC, Inc
15720 Brixham Hill Avenue
Suite 120
Charlotte, NC 28277
704 409 3450

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
DL	Diluted analysis – when appended to Client Sample ID
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
N	Metals Matrix Spike or Matrix Spike Duplicate Recovery is outside control limits
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____
Authorized Signature
GCAL Report 214123017

Case Narrative

Client: ERM NC, INC **Report:** 214123017

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was revised 08/31/15. The data is revised to report non-detects as LOQ U. Additionally J values are not reported.

VOLATILES MASS SPECTROMETRY

In the EPA 8260B analysis, sample 21412301702 (OW-1) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. The dilution is reflected in elevated detection limits.

In the EPA 8260B analysis for analytical batch 548258, the LCS and/or LCSD recoveries are above the upper control limit for Bromomethane. This compound was not detected in the associated samples.

METALS

In the EPA 6020A analysis, samples 21412301702 (OW-1) and 21412301703 (MW-3) had to be diluted in order to bracket the concentration within the calibration range of the instrument.

CONVENTIONALS

In the EPA 300.0 analysis, samples 21412301701 (MW-2), 21412301702 (OW-1) and 21412301703 (MW-3) had to be diluted in order to bracket the concentration within the calibration range of the instrument.

Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21412301701	MW-2	Water	12/29/2014 11:20	12/30/2014 10:00
21412301702	OW-1	Water	12/29/2014 12:30	12/30/2014 10:00
21412301703	MW-3	Water	12/29/2014 13:30	12/30/2014 10:00
21412301704	TRIP BLANK	Water	12/29/2014 00:00	12/30/2014 10:00

Summary of Compounds Detected

MW-2

Collect Date 12/29/2014 11:20 **GCAL ID** 21412301701
Receive Date 12/30/2014 10:00 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
79-01-6	Trichloroethene	24.5	1.00	ug/L

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	7.95	5.00	ug/L
7440-23-5	Sodium	7210	100	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	10.3	0.800	mg/L

OW-1

Collect Date 12/29/2014 12:30 **GCAL ID** 21412301702
Receive Date 12/30/2014 10:00 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
75-34-3	1,1-Dichloroethane	7.68	2.00	ug/L
127-18-4	Tetrachloroethene	15.5	2.00	ug/L
79-01-6	Trichloroethene	323	2.00	ug/L

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	776	10.0	ug/L
7440-23-5	Sodium	11100	200	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	6.93	2.00	mg/L

Summary of Compounds Detected

MW-3

Collect Date 12/29/2014 13:30 **GCAL ID** 21412301703
Receive Date 12/30/2014 10:00 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
79-00-5	1,1,2-Trichloroethane	1.90	1.00	ug/L
75-34-3	1,1-Dichloroethane	9.08	1.00	ug/L
78-93-3	2-Butanone	3.63	1.00	ug/L
67-64-1	Acetone	51.5	1.00	ug/L
67-66-3	Chloroform	1.80	1.00	ug/L
79-20-9	Methyl Acetate	5.87	1.00	ug/L
79-01-6	Trichloroethene	3.51	1.00	ug/L

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	43300	500	ug/L
7440-23-5	Sodium	42200	1000	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	6.77	1.00	mg/L

TRIP BLANK

Collect Date 12/29/2014 00:00 **GCAL ID** 21412301704
Receive Date 12/30/2014 10:00 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
78-93-3	2-Butanone	8.98	1.00	ug/L
67-64-1	Acetone	9.36	1.00	ug/L

Sample Results

MW-2	**Collect Date**	12/29/2014 11:20	**GCAL ID**	21412301701
	Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	12/31/2014 13:54	CJR	548258

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	**Trichloroethene**	**24.5**	**1.00**	**ug/L**
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

MW-2

Collect Date	12/29/2014 11:20	**GCAL ID**	21412301701
Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	12/31/2014 13:54	CJR	548258

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49.7	ug/L	99	78 - 130
1868-53-7	Dibromofluoromethane	50	50.8	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	50.9	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	51.6	ug/L	103	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
12/30/2014 11:30	548165	EPA 3010A	1	01/05/2015 13:10	AWG	548423

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**7.95**	**5.00**	**ug/L**
7440-23-5	**Sodium**	**7210**	**100**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	4	01/06/2015 01:35	RXJ	548426

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**10.3**	**0.800**	**mg/L**

OW-1

Collect Date	12/29/2014 12:30	**GCAL ID**	21412301702
Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	12/31/2014 14:16	CJR	548258

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	2.00 U	2.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	2.00 U	2.00	ug/L
79-00-5	1,1,2-Trichloroethane	2.00 U	2.00	ug/L

Sample Results

OW-1	**Collect Date**	12/29/2014 12:30	**GCAL ID**	21412301702
	Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	12/31/2014 14:16	CJR	548258

CAS#	Parameter	Result	LOQ	Units
75-34-3	**1,1-Dichloroethane**	**7.68**	**2.00**	**ug/L**
75-35-4	1,1-Dichloroethene	2.00 U	2.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	2.00 U	2.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	2.00 U	2.00	ug/L
106-93-4	1,2-Dibromoethane	2.00 U	2.00	ug/L
95-50-1	1,2-Dichlorobenzene	2.00 U	2.00	ug/L
107-06-2	1,2-Dichloroethane	2.00 U	2.00	ug/L
78-87-5	1,2-Dichloropropane	2.00 U	2.00	ug/L
541-73-1	1,3-Dichlorobenzene	2.00 U	2.00	ug/L
106-46-7	1,4-Dichlorobenzene	2.00 U	2.00	ug/L
78-93-3	2-Butanone	2.00 U	2.00	ug/L
591-78-6	2-Hexanone	2.00 U	2.00	ug/L
108-10-1	4-Methyl-2-pentanone	2.00 U	2.00	ug/L
67-64-1	Acetone	2.00 U	2.00	ug/L
71-43-2	Benzene	2.00 U	2.00	ug/L
75-27-4	Bromodichloromethane	2.00 U	2.00	ug/L
75-25-2	Bromoform	2.00 U	2.00	ug/L
74-83-9	Bromomethane	2.00 U	2.00	ug/L
75-15-0	Carbon disulfide	2.00 U	2.00	ug/L
56-23-5	Carbon tetrachloride	2.00 U	2.00	ug/L
108-90-7	Chlorobenzene	2.00 U	2.00	ug/L
75-00-3	Chloroethane	2.00 U	2.00	ug/L
67-66-3	Chloroform	2.00 U	2.00	ug/L
74-87-3	Chloromethane	2.00 U	2.00	ug/L
156-59-2	cis-1,2-Dichloroethene	2.00 U	2.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	2.00 U	2.00	ug/L
110-82-7	Cyclohexane	2.00 U	2.00	ug/L
124-48-1	Dibromochloromethane	2.00 U	2.00	ug/L
75-71-8	Dichlorodifluoromethane	2.00 U	2.00	ug/L
100-41-4	Ethylbenzene	2.00 U	2.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	2.00 U	2.00	ug/L
79-20-9	Methyl Acetate	2.00 U	2.00	ug/L
108-87-2	Methylcyclohexane	2.00 U	2.00	ug/L
75-09-2	Methylene chloride	2.00 U	2.00	ug/L
100-42-5	Styrene	2.00 U	2.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	2.00 U	2.00	ug/L
127-18-4	**Tetrachloroethene**	**15.5**	**2.00**	**ug/L**
108-88-3	Toluene	2.00 U	2.00	ug/L
156-60-5	trans-1,2-Dichloroethene	2.00 U	2.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	2.00 U	2.00	ug/L
79-01-6	**Trichloroethene**	**323**	**2.00**	**ug/L**
75-69-4	Trichlorofluoromethane	2.00 U	2.00	ug/L
76-13-1	Trichlorotrifluoroethane	2.00 U	2.00	ug/L
75-01-4	Vinyl chloride	2.00 U	2.00	ug/L

Sample Results

OW-1

Collect Date	12/29/2014 12:30	**GCAL ID**	21412301702
Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	12/31/2014 14:16	CJR	548258

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	2.00 U	2.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	100	98.2	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	100	100	ug/L	100	77 - 127
2037-26-5	Toluene d8	100	100	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	100	103	ug/L	103	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
12/30/2014 11:30	548165	EPA 3010A	2	01/05/2015 13:17	AWG	548423

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**776**	**10.0**	**ug/L**
7440-23-5	**Sodium**	**11100**	**200**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	10	01/06/2015 01:52	RXJ	548426

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**6.93**	**2.00**	**mg/L**

MW-3

Collect Date	12/29/2014 13:30	**GCAL ID**	21412301703
Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	12/31/2014 14:55	CJR	548258

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	**1,1,2-Trichloroethane**	**1.90**	**1.00**	**ug/L**

Sample Results

MW-3	**Collect Date**	12/29/2014 13:30	**GCAL ID**	21412301703
	Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	12/31/2014 14:55	CJR	548258

CAS#	Parameter	Result	LOQ	Units
75-34-3	**1,1-Dichloroethane**	**9.08**	**1.00**	**ug/L**
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	**2-Butanone**	**3.63**	**1.00**	**ug/L**
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	**Acetone**	**51.5**	**1.00**	**ug/L**
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	**Chloroform**	**1.80**	**1.00**	**ug/L**
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	**Methyl Acetate**	**5.87**	**1.00**	**ug/L**
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	**Trichloroethene**	**3.51**	**1.00**	**ug/L**
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

MW-3	**Collect Date**	12/29/2014 13:30	**GCAL ID**	21412301703
	Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	12/31/2014 14:55	CJR	548258

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.5	ug/L	97	78 - 130
1868-53-7	Dibromofluoromethane	50	51.2	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	50.2	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	49.9	ug/L	100	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
12/30/2014 11:30	548165	EPA 3010A	10	01/05/2015 13:24	AWG	548423

CAS#	Parameter	Result	LOQ	Units
7440-23-5	**Sodium**	**42200**	**1000**	**ug/L**

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
12/30/2014 11:30	548165	EPA 3010A	100	01/05/2015 13:21	AWG	548423

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**43300**	**500**	**ug/L**

Sample Results

MW-3

Collect Date	12/29/2014 13:30	**GCAL ID**	21412301703
Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	01/06/2015 16:15	RXJ	548489

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**6.77**	**1.00**	**mg/L**

TRIP BLANK

Collect Date	12/29/2014 00:00	**GCAL ID**	21412301704
Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	12/31/2014 12:37	CJR	548258

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	**2-Butanone**	**8.98**	**1.00**	**ug/L**
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	**Acetone**	**9.36**	**1.00**	**ug/L**
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L

Sample Results

TRIP BLANK

Collect Date	12/29/2014 00:00	**GCAL ID**	21412301704
Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	12/31/2014 12:37	CJR	548258

CAS#	Parameter	Result	LOQ	Units
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.1	ug/L	100	78 - 130
1868-53-7	Dibromofluoromethane	50	50.8	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	51.1	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	50.4	ug/L	101	71 - 127

GC/MS Volatiles QC Summary

Analytical Batch 548258	Client ID	MB548258		LCS548258				LCSD548258				
	GCAL ID	1395572		1395573				1395574				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	12/31/2014 11:48		12/31/2014 10:14				12/31/2014 10:33				
	Matrix	Water		Water				Water				
EPA 8260B		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,1,1-Trichloroethane	71-55-6	1.00U	1.00	50.0	48.5	97	76 - 126	50.0	48.7	97	0	30
1,1,2,2-Tetrachloroethane	79-34-5	1.00U	1.00	50.0	44.6	89	70 - 122	50.0	47.8	96	7	30
1,1,2-Trichloroethane	79-00-5	1.00U	1.00	50.0	47.4	95	72 - 121	50.0	50.4	101	6	30
1,1-Dichloroethane	75-34-3	1.00U	1.00	50.0	47.9	96	74 - 127	50.0	48.0	96	0	30
1,1-Dichloroethene	75-35-4	1.00U	1.00	50.0	46.5	93	69 - 129	50.0	48.0	96	3	20
1,2,4-Trichlorobenzene	120-82-1	1.00U	1.00	50.0	47.0	94	61 - 135	50.0	47.7	95	1	30
1,2-Dibromo-3-chloropropane	96-12-8	1.00U	1.00	50.0	43.4	87	57 - 121	50.0	47.2	94	8	30
1,2-Dibromoethane	106-93-4	1.00U	1.00	50.0	48.6	97	70 - 124	50.0	51.3	103	5	30
1,2-Dichlorobenzene	95-50-1	1.00U	1.00	50.0	45.3	91	71 - 126	50.0	47.2	94	4	30
1,2-Dichloroethane	107-06-2	1.00U	1.00	50.0	46.1	92	71 - 129	50.0	48.0	96	4	30
1,2-Dichloropropane	78-87-5	1.00U	1.00	50.0	47.1	94	72 - 128	50.0	48.6	97	3	30
1,3-Dichlorobenzene	541-73-1	1.00U	1.00	50.0	45.4	91	74 - 126	50.0	46.7	93	3	30
1,4-Dichlorobenzene	106-46-7	1.00U	1.00	50.0	45.1	90	72 - 122	50.0	46.4	93	3	30
2-Butanone	78-93-3	1.00U	1.00	50.0	42.7	85	58 - 137	50.0	47.0	94	10	30
2-Hexanone	591-78-6	1.00U	1.00	50.0	45.7	91	50 - 135	50.0	50.4	101	10	30
4-Methyl-2-pentanone	108-10-1	1.00U	1.00	50.0	44.6	89	57 - 132	50.0	48.9	98	9	30
Acetone	67-64-1	1.00U	1.00	50.0	43.2	86	44 - 156	50.0	46.2	92	7	30
Benzene	71-43-2	1.00U	1.00	50.0	47.7	95	70 - 129	50.0	47.9	96	0	20
Bromodichloromethane	75-27-4	1.00U	1.00	50.0	50.0	100	74 - 125	50.0	51.5	103	3	30
Bromoform	75-25-2	1.00U	1.00	50.0	48.7	97	64 - 122	50.0	51.7	103	6	30
Bromomethane	74-83-9	1.00U	1.00	50.0	79.3	159*	47 - 138	50.0	77.6	155*	2	30
Carbon disulfide	75-15-0	1.00U	1.00	50.0	48.4	97	69 - 136	50.0	50.2	100	4	30
Carbon tetrachloride	56-23-5	1.00U	1.00	50.0	51.7	103	76 - 128	50.0	52.2	104	1	30
Chlorobenzene	108-90-7	1.00U	1.00	50.0	47.8	96	74 - 123	50.0	49.4	99	3	20
Chloroethane	75-00-3	1.00U	1.00	50.0	50.5	101	62 - 141	50.0	48.0	96	5	30
Chloroform	67-66-3	1.00U	1.00	50.0	48.3	97	75 - 122	50.0	48.6	97	1	30
Chloromethane	74-87-3	1.00U	1.00	50.0	48.9	98	59 - 132	50.0	49.0	98	0	30
cis-1,2-Dichloroethene	156-59-2	1.00U	1.00	50.0	47.3	95	73 - 130	50.0	48.5	97	3	30
cis-1,3-Dichloropropene	10061-01-5	1.00U	1.00	50.0	50.8	102	71 - 132	50.0	52.1	104	3	30
Cyclohexane	110-82-7	1.00U	1.00	50.0	48.8	98	69 - 132	50.0	48.3	97	1	30
Dibromochloromethane	124-48-1	1.00U	1.00	50.0	52.1	104	71 - 123	50.0	54.2	108	4	30
Dichlorodifluoromethane	75-71-8	1.00U	1.00	50.0	48.0	96	58 - 140	50.0	47.4	95	1	30
Ethylbenzene	100-41-4	1.00U	1.00	50.0	48.1	96	74 - 126	50.0	49.4	99	3	30
Isopropylbenzene (Cumene)	98-82-8	1.00U	1.00	50.0	47.9	96	71 - 125	50.0	49.4	99	3	30
Methyl Acetate	79-20-9	1.00U	1.00	50.0	43.2	86	57 - 139	50.0	47.4	95	9	30
Methylcyclohexane	108-87-2	1.00U	1.00	50.0	47.9	96	67 - 138	50.0	47.7	95	0	30
Methylene chloride	75-09-2	1.00U	1.00	50.0	47.2	94	68 - 132	50.0	47.6	95	1	30
Styrene	100-42-5	1.00U	1.00	50.0	50.2	100	71 - 127	50.0	51.9	104	3	30
tert-Butyl methyl ether (MTBE)	1634-04-4	1.00U	1.00	50.0	48.7	97	71 - 125	50.0	50.5	101	4	30
Tetrachloroethene	127-18-4	1.00U	1.00	50.0	49.8	100	68 - 128	50.0	50.5	101	1	30
Toluene	108-88-3	1.00U	1.00	50.0	49.1	98	72 - 120	50.0	49.8	100	1	20
trans-1,2-Dichloroethene	156-60-5	1.00U	1.00	50.0	48.8	98	69 - 132	50.0	48.3	97	1	30
trans-1,3-Dichloropropene	10061-02-6	1.00U	1.00	50.0	51.2	102	71 - 131	50.0	53.8	108	5	30
Trichloroethene	79-01-6	1.00U	1.00	50.0	48.4	97	76 - 129	50.0	49.0	98	1	20
Trichlorofluoromethane	75-69-4	1.00U	1.00	50.0	51.0	102	72 - 136	50.0	48.4	97	5	30
Trichlorotrifluoroethane	76-13-1	1.00U	1.00	50.0	50.2	100	72 - 136	50.0	50.4	101	0	30
Vinyl chloride	75-01-4	1.00U	1.00	50.0	48.2	96	68 - 132	50.0	46.7	93	3	30
Xylene (total)	1330-20-7	1.00U	1.00	150	144	96	74 - 127	150	147	98	2	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	50.3	101	50	49.2	98	71 - 127	50	49.2	98	0	NA
4-Bromofluorobenzene	460-00-4	49.8	100	50	51.6	103	78 - 130	50	51.9	104	1	NA
Dibromofluoromethane	1868-53-7	49.9	100	50	51.5	103	77 - 127	50	51.3	103	0	NA
Toluene d8	2037-26-5	50.9	102	50	50.3	101	76 - 134	50	50	100	1	NA

Inorganics QC Summary

Analytical Batch	Client ID	MB548165		LCS548165			
548239	GCAL ID	1395151		1395152			
Prep Batch	Sample Type	MB		LCS			
548165	Prep Date	12/30/2014 09:40		12/30/2014 09:40			
Prep Method	Analysis Date	12/31/2014 10:00		12/31/2014 10:03			
EPA 3010A	Matrix	Water		Water			
EPA 6020A		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R
Manganese	7439-96-5	5.00U	5.00	50.0	51.2	102	80 - 120
Sodium	7440-23-5	100U	100	5000	5090	102	80 - 120

Analytical Batch	Client ID	AE-2-1 SW		1395087MS				1395087MSD				
548239	GCAL ID	21412294101		1395153				1395154				
Prep Batch	Sample Type	SAMPLE		MS				MSD				
548165	Prep Date	12/30/2014 09:40		12/30/2014 09:40				12/30/2014 09:40				
Prep Method	Analysis Date	12/31/2014 10:07		12/31/2014 10:25				12/31/2014 10:29				
EPA 3010A	Matrix	Water		Water				Water				
EPA 6020A		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Manganese	7439-96-5	2140	500	50.0	2210	**157***	80 - 120	50.0	2180	88	2	20
Sodium	7440-23-5	101000	10000	5000	107000	119	80 - 120	5000	106000	108	1	20

General Chemistry QC Summary

Analytical Batch 548426	Client ID	MB548426		LCS548426			
	GCAL ID	1396241		1396242			
	Sample Type	MB		LCS			
	Prep Date	NA		NA			
	Analysis Date	01/05/2015 20:18		01/05/2015 20:00			
	Matrix	Water		Water			
EPA 300.0, Rev 2.1		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R
Chloride	16887-00-6	0.200U	0.200	2.50	2.31	92	80 - 120

Analytical Batch 548489	Client ID	MB548489		LCS548489			
	GCAL ID	1396486		1396487			
	Sample Type	MB		LCS			
	Prep Date	NA		NA			
	Analysis Date	01/06/2015 15:57		01/07/2015 00:13			
	Matrix	Water		Water			
EPA 300.0, Rev 2.1		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R
Chloride	16887-00-6	0.200U	0.200	2.50	2.44	98	80 - 120

GCAL ANALYTICAL LABORATORIES, LLC

7979 Innovation Park Dr., Baton Rouge, LA 70820-7402
Phone: 225.769.4900 • Fax: 225.767.5717 • www.gcal.com

CHAIN OF CUSTODY RECORD

Client ID: 4783 - ERM NC, INC
SDG: 214123017
Due Date: 01/06/15

Report to:
Client: ERM NC, Inc
Address: 15720 Brixham Hill Ave #620
Charlotte NC 28277
Contact: Michael Pressley
Phone: 704-541-8345
E-mail: Michael.Pressley@erm.com

Bill to:
Client: Same as Report to:
Address:
Contact:
Phone:
E-mail:

P.O. Number
Project Name/Number
Sampled By:

Analytical Requests & Method: VOC 8260; Na, Mn 6010; Cl 300.0

GCAL use only:
Custody Seal used ☑ yes ☐ no
intact ☐ yes ☐ no
Temperature °C 5.1 EZZ

☐ Dissolved Analysis Requested
☐ Field filtered
☐ Lab filtered

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No Containers	HCl Vit C	HNO3	None	Preservative
W	12/29/14	1120		X	MW-2	5	X	X	X	1 8260 Preserv. MW-2 HCl
W	12/29/14	1230		X	OW-1	5	X	X	X	2 8260 Preserv OW-1 Vit-C quenched
W	12/29/14	1330		X	MW-3	5	X	X	X	3
	12/29	830			Trip Blank	3	X			4

Air Bill No: 8066 1452 1510

Turn Around Time (Business Days): ☐ 24h* ☐ 48h* ☐ 3 days* ☐ 1 week* ☑ Standard (Per Contract/Quote)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	12/29/14	1530			
FedEx	12/30/14	1000	Courier	12/30/14	1000
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Note:

By submitting these samples, you agree to GCAL's terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = solid, L = liquid, T = tissue

*Requires prior approval, rush charges may apply.

We cannot accept verbal changes. Please email written changes to your PM.

WHITE: CLIENT FINAL REPORT - CANARY: CLIENT

Revision 1

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

214123017

SAMPLE DELIVERY GROUP 214123017	
Client 4783 - ERM NC, INC	**Transport Method** FEDEX
Profile Number 241445	***Received By*** Saucier, Charlotte M.
Line Item(s) 3 - Water - VOC/Na,Mn/Cl	**Receive Date(s)** 12/30/14

CHECKLIST	YES	NO	NA
Were all samples received using proper thermal preservation?	☑	☐	☐
When used, were all custody seals intact?	☑	☐	☐
Were all samples received in proper containers?	☑	☐	☐
Were all samples received using proper chemical preservation?	☑	☐	☐
Was preservative added to any container at the lab?	☐	☑	☐
Were all containers received in good condition?	☑	☐	☐
Were all VOA vials received with no head space?	☑	☐	☐
Do all sample labels match the Chain of Custody?	☑	☐	☐
Did the Chain of Custody list the sampling technician?	☑	☐	☐
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☐	☑	☐

COOLERS

Airbill	Thermometer ID: E22	Temp(°C)
8066 1452 1510		5.1

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.4

Page 1 of 1

NELAP CERTIFICATE NUMBER: 01955
DOD ELAP CERTIFICATE NUMBER: L14-243

ANALYTICAL RESULTS

PERFORMED BY

GCAL, LLC
7979 Innovation Park Dr.
Baton Rouge, LA 70820

Report Date 01/02/2015

GCAL Report 214123007

Deliver To

Attn ERM Demo

Project Joslyn Clark

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations Utilized in this Report

ND	Indicates the result was Not Detected at the specified LOQ
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
MDL	Method Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags Utilized in this Report

J	Indicates the result is between the MDL and LOQ
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

Authorized Signature
GCAL Report 214123007

Case Narrative

Client: ERM NC, INC **Report:** 214123007

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

VOLATILES MASS SPECTROMETRY

In the EPA 8260B analysis, sample 21412300701 (OW-1) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. The dilution is reflected in elevated detection limits.

In the EPA 8260B analysis for analytical batch 548258, the LCS and/or LCSD recoveries are above the upper control limit for Bromomethane. This compound was not detected in the associated samples.

Report Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21412300701	OW-1	Water	12/29/2014 00:00	12/30/2014 10:00

Summary of Compounds Detected

OW-1				
	Collect Date	12/29/2014 00:00	**GCAL ID**	21412300701
	Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B

CAS#	Parameter	Result	MDL	LOQ	Units
75-34-3	1,1-Dichloroethane	8.58	0.856	5.00	ug/L
75-35-4	1,1-Dichloroethene	3.14J	1.04	5.00	ug/L
79-20-9	Methyl Acetate	8.66	0.797	5.00	ug/L
127-18-4	Tetrachloroethene	15.7	0.963	5.00	ug/L
79-01-6	Trichloroethene	493	0.807	5.00	ug/L

Sample Results

OW-1

Collect Date	12/29/2014 00:00	**GCAL ID**	21412300701
Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	12/31/2014 16:38	CJR	548258

CAS#	Parameter	Result	MDL	LOQ	Units
71-55-6	1,1,1-Trichloroethane	0.615U	0.615	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.546U	0.546	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.795U	0.795	5.00	ug/L
75-34-3	**1,1-Dichloroethane**	**8.58**	**0.856**	**5.00**	**ug/L**
75-35-4	**1,1-Dichloroethene**	**3.14J**	**1.04**	**5.00**	**ug/L**
120-82-1	1,2,4-Trichlorobenzene	0.526U	0.526	5.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	0.971U	0.971	5.00	ug/L
106-93-4	1,2-Dibromoethane	0.512U	0.512	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.674U	0.674	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.581U	0.581	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.752U	0.752	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.689U	0.689	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.416U	0.416	5.00	ug/L
78-93-3	2-Butanone	0.711U	0.711	5.00	ug/L
591-78-6	2-Hexanone	0.612U	0.612	5.00	ug/L
108-10-1	4-Methyl-2-pentanone	0.600U	0.600	5.00	ug/L
67-64-1	Acetone	0.967U	0.967	5.00	ug/L
71-43-2	Benzene	0.555U	0.555	5.00	ug/L
75-27-4	Bromodichloromethane	0.417U	0.417	5.00	ug/L
75-25-2	Bromoform	1.08U	1.08	5.00	ug/L
74-83-9	Bromomethane	2.14U	2.14	5.00	ug/L
75-15-0	Carbon disulfide	0.950U	0.950	5.00	ug/L
56-23-5	Carbon tetrachloride	1.24U	1.24	5.00	ug/L
108-90-7	Chlorobenzene	0.414U	0.414	5.00	ug/L
75-00-3	Chloroethane	1.18U	1.18	5.00	ug/L
67-66-3	Chloroform	0.775U	0.775	5.00	ug/L
74-87-3	Chloromethane	0.718U	0.718	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.517U	0.517	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.621U	0.621	5.00	ug/L
110-82-7	Cyclohexane	1.69U	1.69	5.00	ug/L
124-48-1	Dibromochloromethane	0.270U	0.270	5.00	ug/L
75-71-8	Dichlorodifluoromethane	0.724U	0.724	5.00	ug/L
100-41-4	Ethylbenzene	0.545U	0.545	5.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	0.651U	0.651	5.00	ug/L
79-20-9	**Methyl Acetate**	**8.66**	**0.797**	**5.00**	**ug/L**
108-87-2	Methylcyclohexane	0.717U	0.717	5.00	ug/L
75-09-2	Methylene chloride	0.745U	0.745	5.00	ug/L
100-42-5	Styrene	0.447U	0.447	5.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	0.389U	0.389	5.00	ug/L
127-18-4	**Tetrachloroethene**	**15.7**	**0.963**	**5.00**	**ug/L**
108-88-3	Toluene	0.609U	0.609	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.385U	0.385	5.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	0.639U	0.639	5.00	ug/L
79-01-6	**Trichloroethene**	**493**	**0.807**	**5.00**	**ug/L**
75-69-4	Trichlorofluoromethane	0.785U	0.785	5.00	ug/L
76-13-1	Trichlorotrifluoroethane	0.790U	0.790	5.00	ug/L
75-01-4	Vinyl chloride	0.636U	0.636	5.00	ug/L

Sample Results

OW-1	**Collect Date**	12/29/2014 00:00	**GCAL ID**	21412300701
	Receive Date	12/30/2014 10:00	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	12/31/2014 16:38	CJR	548258

CAS#	Parameter	Result	MDL	LOQ	Units
1330-20-7	Xylene (total)	0.894U	0.894	5.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	250	245	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	250	257	ug/L	103	77 - 127
2037-26-5	Toluene d8	250	248	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	250	259	ug/L	104	71 - 127

GC/MS Volatiles Quality Control Summary

Analytical Batch 548258	Client ID	MB548258	LCS548258	LCSD548258
	GCAL ID	1395572	1395573	1395574
	Sample Type	MB	LCS	LCSD
	Prep Date	NA	NA	NA
	Analysis Date	12/31/2014 11:48	12/31/2014 10:14	12/31/2014 10:33
	Matrix	Water	Water	Water

EPA 8260B		Units Result	ug/L MDL	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,1,1-Trichloroethane	71-55-6	0.123U	0.123	50.0	48.5	97	76 - 126	50.0	48.7	97	0	30
1,1,2,2-Tetrachloroethane	79-34-5	0.109U	0.109	50.0	44.6	89	70 - 122	50.0	47.8	96	7	30
1,1,2-Trichloroethane	79-00-5	0.159U	0.159	50.0	47.4	95	72 - 121	50.0	50.4	101	6	30
1,1-Dichloroethane	75-34-3	0.171U	0.171	50.0	47.9	96	74 - 127	50.0	48.0	96	0	30
1,1-Dichloroethene	75-35-4	0.208U	0.208	50.0	46.5	93	69 - 129	50.0	48.0	96	3	20
1,2,4-Trichlorobenzene	120-82-1	0.105U	0.105	50.0	47.0	94	61 - 135	50.0	47.7	95	1	30
1,2-Dibromo-3-chloropropane	96-12-8	0.194U	0.194	50.0	43.4	87	57 - 121	50.0	47.2	94	8	30
1,2-Dibromoethane	106-93-4	0.102U	0.102	50.0	48.6	97	70 - 124	50.0	51.3	103	5	30
1,2-Dichlorobenzene	95-50-1	0.135U	0.135	50.0	45.3	91	71 - 126	50.0	47.2	94	4	30
1,2-Dichloroethane	107-06-2	0.116U	0.116	50.0	46.1	92	71 - 129	50.0	48.0	96	4	30
1,2-Dichloropropane	78-87-5	0.150U	0.150	50.0	47.1	94	72 - 128	50.0	48.6	97	3	30
1,3-Dichlorobenzene	541-73-1	0.138U	0.138	50.0	45.4	91	74 - 126	50.0	46.7	93	3	30
1,4-Dichlorobenzene	106-46-7	0.083U	0.083	50.0	45.1	90	72 - 122	50.0	46.4	93	3	30
2-Butanone	78-93-3	0.142U	0.142	50.0	42.7	85	58 - 137	50.0	47.0	94	10	30
2-Hexanone	591-78-6	0.122U	0.122	50.0	45.7	91	50 - 135	50.0	50.4	101	10	30
4-Methyl-2-pentanone	108-10-1	0.120U	0.120	50.0	44.6	89	57 - 132	50.0	48.9	98	9	30
Acetone	67-64-1	0.193U	0.193	50.0	43.2	86	44 - 156	50.0	46.2	92	7	30
Benzene	71-43-2	0.111U	0.111	50.0	47.7	95	70 - 129	50.0	47.9	96	0	20
Bromodichloromethane	75-27-4	0.083U	0.083	50.0	50.0	100	74 - 125	50.0	51.5	103	3	30
Bromoform	75-25-2	0.215U	0.215	50.0	48.7	97	64 - 122	50.0	51.7	103	6	30
Bromomethane	74-83-9	0.427U	0.427	50.0	79.3	**159***	47 - 138	50.0	77.6	**155***	2	30
Carbon disulfide	75-15-0	0.190U	0.190	50.0	48.4	97	69 - 136	50.0	50.2	100	4	30
Carbon tetrachloride	56-23-5	0.248U	0.248	50.0	51.7	103	76 - 128	50.0	52.2	104	1	30
Chlorobenzene	108-90-7	0.083U	0.083	50.0	47.8	96	74 - 123	50.0	49.4	99	3	20
Chloroethane	75-00-3	0.235U	0.235	50.0	50.5	101	62 - 141	50.0	48.0	96	5	30
Chloroform	67-66-3	0.155U	0.155	50.0	48.3	97	75 - 122	50.0	48.6	97	1	30
Chloromethane	74-87-3	0.144U	0.144	50.0	48.9	98	59 - 132	50.0	49.0	98	0	30
cis-1,2-Dichloroethene	156-59-2	0.103U	0.103	50.0	47.3	95	73 - 130	50.0	48.5	97	3	30
cis-1,3-Dichloropropene	10061-01-5	0.124U	0.124	50.0	50.8	102	71 - 132	50.0	52.1	104	3	30
Cyclohexane	110-82-7	0.337U	0.337	50.0	48.8	98	69 - 132	50.0	48.3	97	1	30
Dibromochloromethane	124-48-1	0.054U	0.054	50.0	52.1	104	71 - 123	50.0	54.2	108	4	30
Dichlorodifluoromethane	75-71-8	0.145U	0.145	50.0	48.0	96	58 - 140	50.0	47.4	95	1	30
Ethylbenzene	100-41-4	0.109U	0.109	50.0	48.1	96	74 - 126	50.0	49.4	99	3	30
Isopropylbenzene (Cumene)	98-82-8	0.130U	0.130	50.0	47.9	96	71 - 125	50.0	49.4	99	3	30
Methyl Acetate	79-20-9	0.159U	0.159	50.0	43.2	86	57 - 139	50.0	47.4	95	9	30
Methylcyclohexane	108-87-2	0.143U	0.143	50.0	47.9	96	67 - 138	50.0	47.7	95	0	30
Methylene chloride	75-09-2	0.149U	0.149	50.0	47.2	94	68 - 132	50.0	47.6	95	1	30
Styrene	100-42-5	0.089U	0.089	50.0	50.2	100	71 - 127	50.0	51.9	104	3	30
tert-Butyl methyl ether (MTBE)	1634-04-4	0.078U	0.078	50.0	48.7	97	71 - 125	50.0	50.5	101	4	30
Tetrachloroethene	127-18-4	0.193U	0.193	50.0	49.8	100	68 - 128	50.0	50.5	101	1	30
Toluene	108-88-3	0.122U	0.122	50.0	49.1	98	72 - 120	50.0	49.8	100	1	20
trans-1,2-Dichloroethene	156-60-5	0.077U	0.077	50.0	48.8	98	69 - 132	50.0	48.3	97	1	30
trans-1,3-Dichloropropene	10061-02-6	0.128U	0.128	50.0	51.2	102	71 - 131	50.0	53.8	108	5	30
Trichloroethene	79-01-6	0.161U	0.161	50.0	48.4	97	76 - 129	50.0	49.0	98	1	20
Trichlorofluoromethane	75-69-4	0.157U	0.157	50.0	51.0	102	72 - 136	50.0	48.4	97	5	30
Trichlorotrifluoroethane	76-13-1	0.158U	0.158	50.0	50.2	100	72 - 136	50.0	50.4	101	0	30
Vinyl chloride	75-01-4	0.127U	0.127	50.0	48.2	96	68 - 132	50.0	46.7	93	3	30
Xylene (total)	1330-20-7	0.179U	0.179	150	144	96	74 - 127	150	147	98	2	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	50.3	101	50	49.2	98	71 - 127	50	49.2	98	0	NA
4-Bromofluorobenzene	460-00-4	49.8	100	50	51.6	103	78 - 130	50	51.9	104	1	NA
Dibromofluoromethane	1868-53-7	49.9	100	50	51.5	103	77 - 127	50	51.3	103	0	NA
Toluene d8	2037-26-5	50.9	102	50	50.3	101	76 - 134	50	50	100	1	NA

GCAL ANALYTICAL LABORATORIES, LLC

CHAIN OF CUSTODY RECORD

7979 Innovation Park Dr., Baton Rouge, LA 70820-7402
Phone: 225.769.4900 • Fax: 225.767.5717 • www.gcal.com

Client ID: 4783 - ERM NC, INC
SDG: 214123007
Due Date: 01/06/15

Report to:
Client: ERM NC, Inc
Address: 15720 Brixham Hill Ave Ste 120 Charlotte, NC 28277
Contact: Michael Pressley
Phone: 704-541-8345
E-mail: Michael.Pressley@erm.com

Bill to:
Client: same as Report to:
Address:
Contact:
Phone:
E-mail:

P.O. Number

Project Name/Number: Joslyn Clark

Sampled By: Thomas Fisher

Analytical Requests & Method

GCAL use only: 214123

Custody Seal
used ☑ yes ☐ no
intact ☑ yes ☐ no

Temperature °C 5.1 EZZ

☐ Dissolved Analysis Requested
☐ Field filtered
☐ Lab filtered

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No Containers	HCl	VOC 8260	Preservative
W	12/29/14			X	OW-1	3	X		1

Air Bill No: 8066 1452 1510

Turn Around Time (Business Days): ☐ 24h* ☐ 48h* ☐ 3 days* ☐ 1 week* ☑ Standard (Per Contract/Quote)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	12/29/14	1530			
	12/30/14	1000		12/30/14	1000

Note:

By submitting these samples, you agree to GCAL's terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = solid, L = liquid, T = tissue

*Requires prior approval, rush charges may apply.

We cannot accept verbal changes. Please email written changes to your PM.

WHITE: CLIENT FINAL REPORT - CANARY: CLIENT

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

214123007

SAMPLE DELIVERY GROUP 214123007	
Client 4783 - ERM NC, INC	**Transport Method** FEDEX
Profile Number 241445	**Received By** Saucier, Charlotte M.
Line Item(s) 3 - Water - VOC/Na,Mn/Cl	**Receive Date(s)** 12/30/14

CHECKLIST	YES	NO	NA
Were all samples received using proper thermal preservation?	☑	☐	☐
When used, were all custody seals intact?	☑	☐	☐
Were all samples received in proper containers?	☑	☐	☐
Were all samples received using proper chemical preservation?	☑	☐	☐
Was preservative added to any container at the lab?	☐	☑	☐
Were all containers received in good condition?	☑	☐	☐
Were all VOA vials received with no head space?	☑	☐	☑ BSM
Do all sample labels match the Chain of Custody?	☑	☐	☐
Did the Chain of Custody list the sampling technician?	☑	☐	☐
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☐	☑	☐

COOLERS

Airbill	Thermometer ID: E22	Temp(°C)
8066 1452 1510		5.1

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.4

Page 1 of 1

Appendix A-3
270-Day Monitoring Event

NELAP CERTIFICATE NUMBER: 01955
DOD ELAP CERTIFICATE NUMBER: L14-243

ANALYTICAL RESULTS

PERFORMED BY

GCAL, LLC
7979 Innovation Park Dr.
Baton Rouge, LA 70820

Report Date 04/13/2015

GCAL Report 215040417

Deliver To	ERM NC, Inc 15720 Brixham Hill Avenue Suite 120 Charlotte, NC 28277 704 409 3450
Attn	Michael Pressley
Project	Joslyn Clark

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
MDL	Method Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
DL	Dilution
N	Metals Matrix Spike or Matrix Spike Duplicate Recovery is outside control limits
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

Authorized Signature
GCAL Report 215040417

Case Narrative

Client: ERM NC, INC **Report:** 215040417

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

VOLATILES MASS SPECTROMETRY

In the EPA 8260B analysis, sample 21504041703 (OW-1) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. The dilution is reflected in elevated reporting limits.

METALS

In the EPA 6020A analysis, samples 21504041702 (MW-3) and 21504041703 (OW-1) had to be diluted in order to bracket the concentration within the calibration range of the instrument.

In the EPA 6020A analysis, a chemical or physical interference necessitated a dilution for sample 21504041701 (MW-2). This is reflected in the elevated reporting limits.

CONVENTIONALS

In the EPA 300.0, Rev 2.1 analysis, samples 21504041701 (MW-2), 21504041702 (MW-3) and 21504041703 (OW-1) had to be diluted in order to bracket the concentration within the calibration range of the instrument.

Report Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21504041701	MW-2	Water	04/02/2015 15:15	04/04/2015 09:45
21504041702	MW-3	Water	04/02/2015 15:50	04/04/2015 09:45
21504041703	OW-1	Water	04/02/2015 16:15	04/04/2015 09:45
21504081401	TRIP BLANK	Water	04/02/2015 00:00	04/04/2015 09:45

Summary of Compounds Detected

MW-2

Collect Date 04/02/2015 15:15 **GCAL ID** 21504041701
Receive Date 04/04/2015 09:45 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	MDL	LOQ	Units
75-09-2	Methylene chloride	1.53	0.149	1.00	ug/L
79-01-6	Trichloroethene	28.1	0.161	1.00	ug/L

EPA 6020A

CAS#	Parameter	Result	MDL	LOQ	Units
7439-96-5	Manganese	31.5	6.25	25.0	ug/L
7440-23-5	Sodium	7000	125	500	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	MDL	LOQ	Units
16887-00-6	Chloride	8.89	0.250	1.00	mg/L

MW-3

Collect Date 04/02/2015 15:50 **GCAL ID** 21504041702
Receive Date 04/04/2015 09:45 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	MDL	LOQ	Units
79-00-5	1,1,2-Trichloroethane	0.931J	0.159	1.00	ug/L
75-34-3	1,1-Dichloroethane	6.52	0.171	1.00	ug/L
78-93-3	2-Butanone	1.20	0.142	1.00	ug/L
67-64-1	Acetone	35.2	0.193	1.00	ug/L
67-66-3	Chloroform	1.29	0.155	1.00	ug/L
75-09-2	Methylene chloride	2.30	0.149	1.00	ug/L

EPA 6020A

CAS#	Parameter	Result	MDL	LOQ	Units
7439-96-5	Manganese	26700	625	2500	ug/L
7440-23-5	Sodium	28400	250	1000	ug/L

Summary of Compounds Detected

MW-3

Collect Date 04/02/2015 15:50 **GCAL ID** 21504041702
Receive Date 04/04/2015 09:45 **Matrix** Water

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	MDL	LOQ	Units
16887-00-6	Chloride	6.98	0.250	1.00	mg/L

OW-1

Collect Date 04/02/2015 16:15 **GCAL ID** 21504041703
Receive Date 04/04/2015 09:45 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	MDL	LOQ	Units
75-34-3	1,1-Dichloroethane	7.08	0.856	5.00	ug/L
75-35-4	1,1-Dichloroethene	1.22J	1.04	5.00	ug/L
75-09-2	Methylene chloride	5.58	0.745	5.00	ug/L
127-18-4	Tetrachloroethene	14.9	0.963	5.00	ug/L
79-01-6	Trichloroethene	312	0.807	5.00	ug/L

EPA 6020A

CAS#	Parameter	Result	MDL	LOQ	Units
7439-96-5	Manganese	1270	6.25	25.0	ug/L
7440-23-5	Sodium	11100	125	500	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	MDL	LOQ	Units
16887-00-6	Chloride	6.25	0.500	2.00	mg/L

TRIP BLANK

Collect Date 04/02/2015 00:00 **GCAL ID** 21504081401
Receive Date 04/04/2015 09:45 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	MDL	LOQ	Units
75-09-2	Methylene chloride	5.26	0.149	1.00	ug/L
79-01-6	Trichloroethene	0.666J	0.161	1.00	ug/L

Sample Results

MW-2

Collect Date	04/02/2015 15:15	**GCAL ID**	21504041701
Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	04/09/2015 10:01	LBH	555919

CAS#	Parameter	Result	MDL	LOQ	Units
71-55-6	1,1,1-Trichloroethane	0.123U	0.123	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.109U	0.109	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.159U	0.159	1.00	ug/L
75-34-3	1,1-Dichloroethane	0.171U	0.171	1.00	ug/L
75-35-4	1,1-Dichloroethene	0.208U	0.208	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.105U	0.105	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	0.194U	0.194	1.00	ug/L
106-93-4	1,2-Dibromoethane	0.102U	0.102	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.135U	0.135	1.00	ug/L
107-06-2	1,2-Dichloroethane	0.116U	0.116	1.00	ug/L
78-87-5	1,2-Dichloropropane	0.150U	0.150	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.138U	0.138	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.083U	0.083	1.00	ug/L
78-93-3	2-Butanone	0.142U	0.142	1.00	ug/L
591-78-6	2-Hexanone	0.122U	0.122	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	0.120U	0.120	1.00	ug/L
67-64-1	Acetone	0.193U	0.193	1.00	ug/L
71-43-2	Benzene	0.111U	0.111	1.00	ug/L
75-27-4	Bromodichloromethane	0.083U	0.083	1.00	ug/L
75-25-2	Bromoform	0.215U	0.215	1.00	ug/L
74-83-9	Bromomethane	0.427U	0.427	1.00	ug/L
75-15-0	Carbon disulfide	0.190U	0.190	1.00	ug/L
56-23-5	Carbon tetrachloride	0.248U	0.248	1.00	ug/L
108-90-7	Chlorobenzene	0.083U	0.083	1.00	ug/L
75-00-3	Chloroethane	0.235U	0.235	1.00	ug/L
67-66-3	Chloroform	0.155U	0.155	1.00	ug/L
74-87-3	Chloromethane	0.144U	0.144	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.103U	0.103	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.124U	0.124	1.00	ug/L
110-82-7	Cyclohexane	0.337U	0.337	1.00	ug/L
124-48-1	Dibromochloromethane	0.054U	0.054	1.00	ug/L
75-71-8	Dichlorodifluoromethane	0.145U	0.145	1.00	ug/L
100-41-4	Ethylbenzene	0.109U	0.109	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	0.130U	0.130	1.00	ug/L
79-20-9	Methyl Acetate	0.159U	0.159	1.00	ug/L
108-87-2	Methylcyclohexane	0.143U	0.143	1.00	ug/L
75-09-2	**Methylene chloride**	**1.53**	**0.149**	**1.00**	**ug/L**
100-42-5	Styrene	0.089U	0.089	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	0.078U	0.078	1.00	ug/L
127-18-4	Tetrachloroethene	0.193U	0.193	1.00	ug/L
108-88-3	Toluene	0.122U	0.122	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.077U	0.077	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	0.128U	0.128	1.00	ug/L
79-01-6	**Trichloroethene**	**28.1**	**0.161**	**1.00**	**ug/L**
75-69-4	Trichlorofluoromethane	0.157U	0.157	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	0.158U	0.158	1.00	ug/L
75-01-4	Vinyl chloride	0.127U	0.127	1.00	ug/L

Sample Results

MW-2

Collect Date 04/02/2015 15:15 **GCAL ID** 21504041701
Receive Date 04/04/2015 09:45 **Matrix** Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	04/09/2015 10:01	LBH	555919

CAS#	Parameter	Result	MDL	LOQ	Units
1330-20-7	Xylene (total)	0.179U	0.179	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.9	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	50	52	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	50.8	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	51.5	ug/L	103	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
04/08/2015 13:35	555833	EPA 3010A	5	04/09/2015 14:41	TAH	555948

CAS#	Parameter	Result	MDL	LOQ	Units
7439-96-5	**Manganese**	**31.5**	**6.25**	**25.0**	**ug/L**
7440-23-5	**Sodium**	**7000**	**125**	**500**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	04/08/2015 21:57	RXJ	555828

CAS#	Parameter	Result	MDL	LOQ	Units
16887-00-6	**Chloride**	**8.89**	**0.250**	**1.00**	**mg/L**

MW-3

Collect Date 04/02/2015 15:50 **GCAL ID** 21504041702
Receive Date 04/04/2015 09:45 **Matrix** Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	04/09/2015 16:32	CLH	555919

CAS#	Parameter	Result	MDL	LOQ	Units
71-55-6	1,1,1-Trichloroethane	0.123U	0.123	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.109U	0.109	1.00	ug/L
79-00-5	**1,1,2-Trichloroethane**	**0.931J**	**0.159**	**1.00**	**ug/L**
75-34-3	**1,1-Dichloroethane**	**6.52**	**0.171**	**1.00**	**ug/L**
75-35-4	1,1-Dichloroethene	0.208U	0.208	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.105U	0.105	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	0.194U	0.194	1.00	ug/L
106-93-4	1,2-Dibromoethane	0.102U	0.102	1.00	ug/L

Sample Results

MW-3

Collect Date	04/02/2015 15:50	**GCAL ID**	21504041702
Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	04/09/2015 16:32	CLH	555919

CAS#	Parameter	Result	MDL	LOQ	Units
95-50-1	1,2-Dichlorobenzene	0.135U	0.135	1.00	ug/L
107-06-2	1,2-Dichloroethane	0.116U	0.116	1.00	ug/L
78-87-5	1,2-Dichloropropane	0.150U	0.150	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.138U	0.138	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.083U	0.083	1.00	ug/L
78-93-3	**2-Butanone**	**1.20**	**0.142**	**1.00**	**ug/L**
591-78-6	2-Hexanone	0.122U	0.122	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	0.120U	0.120	1.00	ug/L
67-64-1	**Acetone**	**35.2**	**0.193**	**1.00**	**ug/L**
71-43-2	Benzene	0.111U	0.111	1.00	ug/L
75-27-4	Bromodichloromethane	0.083U	0.083	1.00	ug/L
75-25-2	Bromoform	0.215U	0.215	1.00	ug/L
74-83-9	Bromomethane	0.427U	0.427	1.00	ug/L
75-15-0	Carbon disulfide	0.190U	0.190	1.00	ug/L
56-23-5	Carbon tetrachloride	0.248U	0.248	1.00	ug/L
108-90-7	Chlorobenzene	0.083U	0.083	1.00	ug/L
75-00-3	Chloroethane	0.235U	0.235	1.00	ug/L
67-66-3	**Chloroform**	**1.29**	**0.155**	**1.00**	**ug/L**
74-87-3	Chloromethane	0.144U	0.144	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.103U	0.103	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.124U	0.124	1.00	ug/L
110-82-7	Cyclohexane	0.337U	0.337	1.00	ug/L
124-48-1	Dibromochloromethane	0.054U	0.054	1.00	ug/L
75-71-8	Dichlorodifluoromethane	0.145U	0.145	1.00	ug/L
100-41-4	Ethylbenzene	0.109U	0.109	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	0.130U	0.130	1.00	ug/L
79-20-9	Methyl Acetate	0.159U	0.159	1.00	ug/L
108-87-2	Methylcyclohexane	0.143U	0.143	1.00	ug/L
75-09-2	**Methylene chloride**	**2.30**	**0.149**	**1.00**	**ug/L**
100-42-5	Styrene	0.089U	0.089	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	0.078U	0.078	1.00	ug/L
127-18-4	Tetrachloroethene	0.193U	0.193	1.00	ug/L
108-88-3	Toluene	0.122U	0.122	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.077U	0.077	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	0.128U	0.128	1.00	ug/L
79-01-6	Trichloroethene	0.161U	0.161	1.00	ug/L
75-69-4	Trichlorofluoromethane	0.157U	0.157	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	0.158U	0.158	1.00	ug/L
75-01-4	Vinyl chloride	0.127U	0.127	1.00	ug/L
1330-20-7	Xylene (total)	0.179U	0.179	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48	ug/L	96	78 - 130
1868-53-7	Dibromofluoromethane	50	52.4	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	48.2	ug/L	96	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	53.1	ug/L	106	71 - 127

Sample Results

MW-3

Collect Date	04/02/2015 15:50	**GCAL ID**	21504041702
Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
04/08/2015 13:35	555833	EPA 3010A	10	04/09/2015 14:48	TAH	555948

CAS#	Parameter	Result	MDL	LOQ	Units
7440-23-5	**Sodium**	**28400**	**250**	**1000**	**ug/L**

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
04/08/2015 13:35	555833	EPA 3010A	500	04/09/2015 14:20	TAH	555948

CAS#	Parameter	Result	MDL	LOQ	Units
7439-96-5	**Manganese**	**26700**	**625**	**2500**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	04/09/2015 21:31	RXJ	555950

CAS#	Parameter	Result	MDL	LOQ	Units
16887-00-6	**Chloride**	**6.98**	**0.250**	**1.00**	**mg/L**

OW-1

Collect Date	04/02/2015 16:15	**GCAL ID**	21504041703
Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	04/09/2015 10:24	LBH	555919

CAS#	Parameter	Result	MDL	LOQ	Units
71-55-6	1,1,1-Trichloroethane	0.615U	0.615	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.546U	0.546	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.795U	0.795	5.00	ug/L
75-34-3	**1,1-Dichloroethane**	**7.08**	**0.856**	**5.00**	**ug/L**
75-35-4	**1,1-Dichloroethene**	**1.22J**	**1.04**	**5.00**	**ug/L**
120-82-1	1,2,4-Trichlorobenzene	0.526U	0.526	5.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	0.971U	0.971	5.00	ug/L
106-93-4	1,2-Dibromoethane	0.512U	0.512	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.674U	0.674	5.00	ug/L
107-06-2	1,2-Dichloroethane	0.581U	0.581	5.00	ug/L
78-87-5	1,2-Dichloropropane	0.752U	0.752	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.689U	0.689	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.416U	0.416	5.00	ug/L
78-93-3	2-Butanone	0.711U	0.711	5.00	ug/L
591-78-6	2-Hexanone	0.612U	0.612	5.00	ug/L
108-10-1	4-Methyl-2-pentanone	0.600U	0.600	5.00	ug/L

Sample Results

OW-1	**Collect Date**	04/02/2015 16:15	**GCAL ID**	21504041703
	Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	04/09/2015 10:24	LBH	555919

CAS#	Parameter	Result	MDL	LOQ	Units
67-64-1	Acetone	0.967U	0.967	5.00	ug/L
71-43-2	Benzene	0.555U	0.555	5.00	ug/L
75-27-4	Bromodichloromethane	0.417U	0.417	5.00	ug/L
75-25-2	Bromoform	1.08U	1.08	5.00	ug/L
74-83-9	Bromomethane	2.14U	2.14	5.00	ug/L
75-15-0	Carbon disulfide	0.950U	0.950	5.00	ug/L
56-23-5	Carbon tetrachloride	1.24U	1.24	5.00	ug/L
108-90-7	Chlorobenzene	0.414U	0.414	5.00	ug/L
75-00-3	Chloroethane	1.18U	1.18	5.00	ug/L
67-66-3	Chloroform	0.775U	0.775	5.00	ug/L
74-87-3	Chloromethane	0.718U	0.718	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.517U	0.517	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.621U	0.621	5.00	ug/L
110-82-7	Cyclohexane	1.69U	1.69	5.00	ug/L
124-48-1	Dibromochloromethane	0.270U	0.270	5.00	ug/L
75-71-8	Dichlorodifluoromethane	0.724U	0.724	5.00	ug/L
100-41-4	Ethylbenzene	0.545U	0.545	5.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	0.651U	0.651	5.00	ug/L
79-20-9	Methyl Acetate	0.797U	0.797	5.00	ug/L
108-87-2	Methylcyclohexane	0.717U	0.717	5.00	ug/L
75-09-2	**Methylene chloride**	**5.58**	**0.745**	**5.00**	**ug/L**
100-42-5	Styrene	0.447U	0.447	5.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	0.389U	0.389	5.00	ug/L
127-18-4	**Tetrachloroethene**	**14.9**	**0.963**	**5.00**	**ug/L**
108-88-3	Toluene	0.609U	0.609	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.385U	0.385	5.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	0.639U	0.639	5.00	ug/L
79-01-6	**Trichloroethene**	**312**	**0.807**	**5.00**	**ug/L**
75-69-4	Trichlorofluoromethane	0.785U	0.785	5.00	ug/L
76-13-1	Trichlorotrifluoroethane	0.790U	0.790	5.00	ug/L
75-01-4	Vinyl chloride	0.636U	0.636	5.00	ug/L
1330-20-7	Xylene (total)	0.894U	0.894	5.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	250	244	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	250	259	ug/L	104	77 - 127
2037-26-5	Toluene d8	250	258	ug/L	103	76 - 134
17060-07-0	1,2-Dichloroethane-d4	250	257	ug/L	103	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
04/08/2015 13:35	555833	EPA 3010A	5	04/09/2015 14:51	TAH	555948

CAS#	Parameter	Result	MDL	LOQ	Units
7439-96-5	**Manganese**	**1270**	**6.25**	**25.0**	**ug/L**
7440-23-5	**Sodium**	**11100**	**125**	**500**	**ug/L**

Sample Results

OW-1

Collect Date	04/02/2015 16:15	**GCAL ID**	21504041703
Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	10	04/08/2015 22:32	RXJ	555828

CAS#	Parameter	Result	MDL	LOQ	Units
16887-00-6	**Chloride**	**6.25**	**0.500**	**2.00**	**mg/L**

TRIP BLANK

Collect Date	04/02/2015 00:00	**GCAL ID**	21504081401
Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	04/09/2015 11:27	LBH	555919

CAS#	Parameter	Result	MDL	LOQ	Units
71-55-6	1,1,1-Trichloroethane	0.123U	0.123	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.109U	0.109	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	0.159U	0.159	1.00	ug/L
75-34-3	1,1-Dichloroethane	0.171U	0.171	1.00	ug/L
75-35-4	1,1-Dichloroethene	0.208U	0.208	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.105U	0.105	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	0.194U	0.194	1.00	ug/L
106-93-4	1,2-Dibromoethane	0.102U	0.102	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	0.135U	0.135	1.00	ug/L
107-06-2	1,2-Dichloroethane	0.116U	0.116	1.00	ug/L
78-87-5	1,2-Dichloropropane	0.150U	0.150	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	0.138U	0.138	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	0.083U	0.083	1.00	ug/L
78-93-3	2-Butanone	0.142U	0.142	1.00	ug/L
591-78-6	2-Hexanone	0.122U	0.122	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	0.120U	0.120	1.00	ug/L
67-64-1	Acetone	0.193U	0.193	1.00	ug/L
71-43-2	Benzene	0.111U	0.111	1.00	ug/L
75-27-4	Bromodichloromethane	0.083U	0.083	1.00	ug/L
75-25-2	Bromoform	0.215U	0.215	1.00	ug/L
74-83-9	Bromomethane	0.427U	0.427	1.00	ug/L
75-15-0	Carbon disulfide	0.190U	0.190	1.00	ug/L
56-23-5	Carbon tetrachloride	0.248U	0.248	1.00	ug/L
108-90-7	Chlorobenzene	0.083U	0.083	1.00	ug/L
75-00-3	Chloroethane	0.235U	0.235	1.00	ug/L
67-66-3	Chloroform	0.155U	0.155	1.00	ug/L
74-87-3	Chloromethane	0.144U	0.144	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	0.103U	0.103	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.124U	0.124	1.00	ug/L
110-82-7	Cyclohexane	0.337U	0.337	1.00	ug/L
124-48-1	Dibromochloromethane	0.054U	0.054	1.00	ug/L
75-71-8	Dichlorodifluoromethane	0.145U	0.145	1.00	ug/L
100-41-4	Ethylbenzene	0.109U	0.109	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	0.130U	0.130	1.00	ug/L
79-20-9	Methyl Acetate	0.159U	0.159	1.00	ug/L
108-87-2	Methylcyclohexane	0.143U	0.143	1.00	ug/L
75-09-2	**Methylene chloride**	**5.26**	**0.149**	**1.00**	**ug/L**
100-42-5	Styrene	0.089U	0.089	1.00	ug/L

Sample Results

TRIP BLANK

Collect Date	04/02/2015 00:00	**GCAL ID**	21504081401
Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	04/09/2015 11:27	LBH	555919

CAS#	Parameter	Result	MDL	LOQ	Units
1634-04-4	tert-Butyl methyl ether (MTBE)	0.078U	0.078	1.00	ug/L
127-18-4	Tetrachloroethene	0.193U	0.193	1.00	ug/L
108-88-3	Toluene	0.122U	0.122	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	0.077U	0.077	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	0.128U	0.128	1.00	ug/L
79-01-6	**Trichloroethene**	**0.666J**	**0.161**	**1.00**	**ug/L**
75-69-4	Trichlorofluoromethane	0.157U	0.157	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	0.158U	0.158	1.00	ug/L
75-01-4	Vinyl chloride	0.127U	0.127	1.00	ug/L
1330-20-7	Xylene (total)	0.179U	0.179	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.4	ug/L	97	78 - 130
1868-53-7	Dibromofluoromethane	50	51.9	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	51.1	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52.4	ug/L	105	71 - 127

GC/MS Volatiles Quality Control Summary

Analytical Batch 555919	Client ID	MB555919	LCS555919	LCSD555919
	GCAL ID	1432691	1432692	1432693
	Sample Type	MB	LCS	LCSD
	Prep Date	NA	NA	NA
	Analysis Date	04/09/2015 09:41	04/09/2015 08:18	04/09/2015 08:41
	Matrix	Water	Water	Water

EPA 8260B		Units Result	ug/L MDL	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,1,1-Trichloroethane	71-55-6	0.123U	0.123	50.0	52.9	106	76 - 126	50.0	57.1	114	8	30
1,1,2,2-Tetrachloroethane	79-34-5	0.109U	0.109	50.0	54.7	109	70 - 122	50.0	55.4	111	1	30
1,1,2-Trichloroethane	79-00-5	0.159U	0.159	50.0	51.1	102	72 - 121	50.0	52.7	105	3	30
1,1-Dichloroethane	75-34-3	0.171U	0.171	50.0	52.0	104	74 - 127	50.0	56.4	113	8	30
1,1-Dichloroethene	75-35-4	0.208U	0.208	50.0	50.9	102	69 - 129	50.0	56.5	113	10	20
1,2,4-Trichlorobenzene	120-82-1	0.105U	0.105	50.0	57.9	116	61 - 135	50.0	60.7	121	5	30
1,2-Dibromo-3-chloropropane	96-12-8	0.194U	0.194	50.0	56.5	113	57 - 121	50.0	57.3	115	1	30
1,2-Dibromoethane	106-93-4	0.102U	0.102	50.0	52.3	105	70 - 124	50.0	53.0	106	1	30
1,2-Dichlorobenzene	95-50-1	0.135U	0.135	50.0	52.5	105	71 - 126	50.0	55.3	111	5	30
1,2-Dichloroethane	107-06-2	0.116U	0.116	50.0	51.4	103	71 - 129	50.0	53.7	107	4	30
1,2-Dichloropropane	78-87-5	0.150U	0.150	50.0	52.9	106	72 - 128	50.0	56.3	113	6	30
1,3-Dichlorobenzene	541-73-1	0.138U	0.138	50.0	52.6	105	74 - 126	50.0	56.0	112	6	30
1,4-Dichlorobenzene	106-46-7	0.083U	0.083	50.0	51.9	104	72 - 122	50.0	55.1	110	6	30
2-Butanone	78-93-3	0.142U	0.142	50.0	61.2	122	58 - 137	50.0	63.5	127	4	30
2-Hexanone	591-78-6	0.122U	0.122	50.0	53.3	107	50 - 135	50.0	55.3	111	4	30
4-Methyl-2-pentanone	108-10-1	0.120U	0.120	50.0	55.5	111	57 - 132	50.0	56.8	114	2	30
Acetone	67-64-1	0.193U	0.193	50.0	66.9	134	44 - 156	50.0	69.9	140	4	30
Benzene	71-43-2	0.111U	0.111	50.0	53.2	106	70 - 129	50.0	56.8	114	7	20
Bromodichloromethane	75-27-4	0.083U	0.083	50.0	53.2	106	74 - 125	50.0	56.5	113	6	30
Bromoform	75-25-2	0.215U	0.215	50.0	53.6	107	64 - 122	50.0	54.0	108	1	30
Bromomethane	74-83-9	0.427U	0.427	50.0	37.2	74	47 - 138	50.0	44.7	89	18	30
Carbon disulfide	75-15-0	0.190U	0.190	50.0	53.2	106	69 - 136	50.0	58.5	117	9	30
Carbon tetrachloride	56-23-5	0.248U	0.248	50.0	60.1	120	76 - 128	50.0	64.1	128	6	30
Chlorobenzene	108-90-7	0.083U	0.083	50.0	51.4	103	74 - 123	50.0	54.4	109	6	20
Chloroethane	75-00-3	0.235U	0.235	50.0	52.6	105	62 - 141	50.0	57.2	114	8	30
Chloroform	67-66-3	0.155U	0.155	50.0	51.6	103	75 - 122	50.0	55.1	110	7	30
Chloromethane	74-87-3	0.144U	0.144	50.0	41.6	83	59 - 132	50.0	44.4	89	7	30
cis-1,2-Dichloroethene	156-59-2	0.103U	0.103	50.0	52.4	105	73 - 130	50.0	56.3	113	7	30
cis-1,3-Dichloropropene	10061-01-5	0.124U	0.124	50.0	56.6	113	71 - 132	50.0	57.8	116	2	30
Cyclohexane	110-82-7	0.337U	0.337	50.0	48.0	96	69 - 132	50.0	52.4	105	9	30
Dibromochloromethane	124-48-1	0.054U	0.054	50.0	52.3	105	71 - 123	50.0	54.6	109	4	30
Dichlorodifluoromethane	75-71-8	0.145U	0.145	50.0	48.0	96	58 - 140	50.0	53.1	106	10	30
Ethylbenzene	100-41-4	0.109U	0.109	50.0	53.1	106	74 - 126	50.0	56.9	114	7	30
Isopropylbenzene (Cumene)	98-82-8	0.130U	0.130	50.0	55.7	111	71 - 125	50.0	59.9	120	7	30
Methyl Acetate	79-20-9	0.159U	0.159	50.0	53.3	107	57 - 139	50.0	56.0	112	5	30
Methylcyclohexane	108-87-2	0.143U	0.143	50.0	47.6	95	67 - 138	50.0	52.0	104	9	30
Methylene chloride	75-09-2	0.149U	0.149	50.0	50.2	100	68 - 132	50.0	53.0	106	5	30
Styrene	100-42-5	0.089U	0.089	50.0	55.8	112	71 - 127	50.0	58.8	118	5	30
tert-Butyl methyl ether (MTBE)	1634-04-4	0.078U	0.078	50.0	52.5	105	71 - 125	50.0	54.2	108	3	30
Tetrachloroethene	127-18-4	0.193U	0.193	50.0	50.3	101	68 - 128	50.0	55.1	110	9	30
Toluene	108-88-3	0.122U	0.122	50.0	51.4	103	72 - 120	50.0	55.2	110	7	20
trans-1,2-Dichloroethene	156-60-5	0.077U	0.077	50.0	52.3	105	69 - 132	50.0	56.3	113	7	30
trans-1,3-Dichloropropene	10061-02-6	0.128U	0.128	50.0	56.3	113	71 - 131	50.0	57.2	114	2	30
Trichloroethene	79-01-6	0.161U	0.161	50.0	50.5	101	76 - 129	50.0	55.1	110	9	20
Trichlorofluoromethane	75-69-4	0.157U	0.157	50.0	52.7	105	72 - 136	50.0	57.5	115	9	30
Trichlorotrifluoroethane	76-13-1	0.158U	0.158	50.0	51.0	102	72 - 136	50.0	56.5	113	10	30
Vinyl chloride	75-01-4	0.127U	0.127	50.0	51.7	103	68 - 132	50.0	56.8	114	9	30
Xylene (total)	1330-20-7	0.179U	0.179	150	164	109	74 - 127	150	174	116	6	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	51.9	104	50	50.2	100	71 - 127	50	50.9	102	1	NA
4-Bromofluorobenzene	460-00-4	48.1	96	50	49.3	99	78 - 130	50	49.1	98	0	NA
Dibromofluoromethane	1868-53-7	52	104	50	50	100	77 - 127	50	50.1	100	0	NA
Toluene d8	2037-26-5	50.8	102	50	49.2	98	76 - 134	50	49.2	98	0	NA

Inorganics Quality Control Summary

Analytical Batch	Client ID	MB555833		LCS555833			
555948	GCAL ID	1432238		1432239			
Prep Batch	Sample Type	MB		LCS			
555833	Prep Date	04/08/2015 13:35		04/08/2015 13:35			
Prep Method	Analysis Date	04/09/2015 11:59		04/09/2015 12:03			
EPA 3010A	Matrix	Water		Water			
EPA 6020A		Units Result	ug/L MDL	Spike Added	Result	%R	Control Limits%R
Manganese	7439-96-5	1.25U	1.25	50.0	52.5	105	80 - 120
Sodium	7440-23-5	25.0U	25.0	5000	5310	106	80 - 120

General Chemistry Quality Control Summary

Analytical Batch 555828	Client ID	MWQ-22		MWQ-22-MS				MWQ-22-MSD				
	GCAL ID	21504040801		21504040802				21504040803				
	Sample Type	SAMPLE		MS				MSD				
	Prep Date	NA		NA				NA				
	Analysis Date	04/08/2015 20:30		04/08/2015 20:48				04/08/2015 21:05				
	Matrix	Water		Water				Water				
EPA 300.0, Rev 2.1		Units Result	MDL	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Chloride	16887-00-6	320	15.0	750	987	89	80 - 120	750	992	90	0	15

Analytical Batch 555828	Client ID	MB555828		LCS555828			
	GCAL ID	1432227		1432228			
	Sample Type	MB		LCS			
	Prep Date	NA		NA			
	Analysis Date	04/08/2015 23:42		04/08/2015 23:24			
	Matrix	Water		Water			
EPA 300.0, Rev 2.1		Units Result	mg/L MDL	Spike Added	Result	%R	Control Limits%R
Chloride	16887-00-6	0.050U	0.050	2.50	2.31	92	80 - 120

Analytical Batch 555950	Client ID	MB555950		LCS555950			
	GCAL ID	1432861		1432862			
	Sample Type	MB		LCS			
	Prep Date	NA		NA			
	Analysis Date	04/09/2015 21:14		04/09/2015 20:56			
	Matrix	Water		Water			
EPA 300.0, Rev 2.1		Units Result	mg/L MDL	Spike Added	Result	%R	Control Limits%R
Chloride	16887-00-6	0.050U	0.050	2.50	2.43	97	80 - 120

Analytical Batch 555950	Client ID	MWQ-20		1431111MS				1431111MSD				
	GCAL ID	21504040602		1432863				1432864				
	Sample Type	SAMPLE		MS				MSD				
	Prep Date	NA		NA				NA				
	Analysis Date	04/10/2015 01:03		04/10/2015 01:20				04/10/2015 01:38				
	Matrix	Water		Water				Water				
EPA 300.0, Rev 2.1		Units Result	MDL	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Chloride	16887-00-6	5490	250	12500	17700	98	80 - 120	12500	17700	98	0	15

GCAL ANALYTICAL LABORATORIES, LLC

7979 Innovation Park Dr., Baton Rouge, LA 70820-7402
Phone: 225.769.4900 • Fax: 225.767.5717 • www.gcal.com

CHAIN OF CUSTODY RECORD

Client ID: 4783 - ERM NC, INC
SDG: 215040417
Due Date: 04/10/15

Report to:
Client: ERM NC, Inc.
Address: 15720 BRIXHAM HILL AVE
CHARLOTTE, NC 28270
Contact: MICHAEL PRESSLEY
Phone: 704 541 8345
E-mail: michael.pressley@erm.com

Bill to:
Client:
Address: SAME
Contact:
Phone:
E-mail:

P.O. Number
Project Name/Number: JOSLYN CLARK 0253066
Sampled By: MICHAEL PRESSLEY

Analytical Requests & Method: VOCs by 8260 | SODIUM | MANGANESE | CHLORIDE

GCAL use only:
Custody Seal used ☑ yes ☐ no
intact ☑ yes ☐ no
Temperature °C 1.8E24

☐ Dissolved Analysis Requested
☐ Field filtered
☐ Lab filtered

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No Containers	Vit. C	HNO3	NONE	Preservative
W	4/2/15	1515		X	MW-2	5	X	X	X	VOAs preserved with 1
W		1550		X	MW-3	5	X	X	X	ascorbic acid 2mg to 2
W		1615		X	DW-1	5	X	X	X	VIAL-3
W	4/2/15				Trip Blank		X			08140t 250487701 AMW 4/10/15

Air Bill No: ~~4855~~ 8071 4855 0610

Turn Around Time (Business Days): ☐ 24h* ☐ 48h* ☐ 3 days* ☐ 1 week* ☒ Standard (Per Contract/Quote)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Michael Pressley	4-3-15	1600			
Fed EX	4-4-15	9:45	Dodie McClure	4-4-15	9:45

Note:

By submitting these samples, you agree to GCAL's terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = solid, L = liquid, T = tissue

*Requires prior approval, rush charges may apply.

We cannot accept verbal changes. Please email written changes to your PM.

WHITE: CLIENT FINAL REPORT - CANARY: CLIENT

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

215040417

SAMPLE DELIVERY GROUP 215040417	
Client 4783 - ERM NC, INC	**Transport Method** FEDEX
Profile Number 241445	**Received By** McCune, Dodie N.
Line Item(s) 3 - Water - VOC/Na,Mn/Cl	**Receive Date(s)** 04/04/15

CHECKLIST	YES	NO	NA
Were all samples received using proper thermal preservation?	☑	☐	☐
When used, were all custody seals intact?	☑	☐	☐
Were all samples received in proper containers?	☑	☐	☐
Were all samples received using proper chemical preservation?	☑	☐	☐
Was preservative added to any container at the lab?	☐	☑	☐
Were all containers received in good condition?	☑	☐	☐
Were all VOA vials received with no head space?	☑	☐	☐
Do all sample labels match the Chain of Custody?	☐	☑	☐
Did the Chain of Custody list the sampling technician?	☑	☐	☐
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☐	☑	☐

COOLERS

Airbill	Thermometer ID: E24	Temp(°C)
807148550610		1.8

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.4

Page 1 of 1

ANALYTICAL RESULTS

PERFORMED BY

GCAL, LLC
7979 Innovation Park Dr.
Baton Rouge, LA 70820

Report Date 08/31/2015

GCAL Report 215040418

Project Joslyn Clark

Deliver To
Michael Pressley
ERM NC, Inc
15720 Brixham Hill Avenue
Suite 120
Charlotte, NC 28277
704 409 3450

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
DL	Diluted analysis – when appended to Client Sample ID
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
N	Metals Matrix Spike or Matrix Spike Duplicate Recovery is outside control limits
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____
Authorized Signature
GCAL Report 215040418

Case Narrative

Client: ERM NC, INC **Report:** 215040418

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was revised 08/31/15. The data is revised to report non-detects as LOQ U. Additionally J values are not reported.

VOLATILES MASS SPECTROMETRY

In the EPA 8260B analysis, sample 21504041802 (OW-1) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. The dilution is reflected in elevated detection limits.

Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21504041801	MW-3	Water	04/02/2015 15:50	04/04/2015 09:45
21504041802	OW-1	Water	04/02/2015 16:15	04/04/2015 09:45

Summary of Compounds Detected

MW-3

Collect Date	04/02/2015 15:50	**GCAL ID**	21504041801
Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
79-00-5	1,1,2-Trichloroethane	1.02	1.00	ug/L
75-34-3	1,1-Dichloroethane	6.79	1.00	ug/L
67-64-1	Acetone	24.2	1.00	ug/L
67-66-3	Chloroform	1.28	1.00	ug/L
79-20-9	Methyl Acetate	10.5	1.00	ug/L
75-09-2	Methylene chloride	1.32	1.00	ug/L
79-01-6	Trichloroethene	2.25	1.00	ug/L

OW-1

Collect Date	04/02/2015 16:15	**GCAL ID**	21504041802
Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
75-34-3	1,1-Dichloroethane	7.64	5.00	ug/L
79-20-9	Methyl Acetate	9.71	5.00	ug/L
127-18-4	Tetrachloroethene	15.1	5.00	ug/L
79-01-6	Trichloroethene	392	5.00	ug/L

Sample Results

MW-3	**Collect Date**	04/02/2015 15:50	**GCAL ID**	21504041801
	Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	04/09/2015 10:44	LBH	555919

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	**1,1,2-Trichloroethane**	**1.02**	**1.00**	**ug/L**
75-34-3	**1,1-Dichloroethane**	**6.79**	**1.00**	**ug/L**
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	**Acetone**	**24.2**	**1.00**	**ug/L**
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	**Chloroform**	**1.28**	**1.00**	**ug/L**
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	**Methyl Acetate**	**10.5**	**1.00**	**ug/L**
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	**Methylene chloride**	**1.32**	**1.00**	**ug/L**
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	**Trichloroethene**	**2.25**	**1.00**	**ug/L**
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

MW-3

Collect Date	04/02/2015 15:50	**GCAL ID**	21504041801
Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	04/09/2015 10:44	LBH	555919

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.4	ug/L	97	78 - 130
1868-53-7	Dibromofluoromethane	50	52.1	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	50.7	ug/L	101	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	50.9	ug/L	102	71 - 127

OW-1

Collect Date	04/02/2015 16:15	**GCAL ID**	21504041802
Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	04/09/2015 11:07	LBH	555919

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	5.00 U	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	5.00 U	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	5.00 U	5.00	ug/L
75-34-3	**1,1-Dichloroethane**	**7.64**	**5.00**	**ug/L**
75-35-4	1,1-Dichloroethene	5.00 U	5.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	5.00 U	5.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	5.00 U	5.00	ug/L
106-93-4	1,2-Dibromoethane	5.00 U	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	5.00 U	5.00	ug/L
107-06-2	1,2-Dichloroethane	5.00 U	5.00	ug/L
78-87-5	1,2-Dichloropropane	5.00 U	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	5.00 U	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	5.00 U	5.00	ug/L
78-93-3	2-Butanone	5.00 U	5.00	ug/L
591-78-6	2-Hexanone	5.00 U	5.00	ug/L
108-10-1	4-Methyl-2-pentanone	5.00 U	5.00	ug/L
67-64-1	Acetone	5.00 U	5.00	ug/L
71-43-2	Benzene	5.00 U	5.00	ug/L
75-27-4	Bromodichloromethane	5.00 U	5.00	ug/L
75-25-2	Bromoform	5.00 U	5.00	ug/L
74-83-9	Bromomethane	5.00 U	5.00	ug/L
75-15-0	Carbon disulfide	5.00 U	5.00	ug/L
56-23-5	Carbon tetrachloride	5.00 U	5.00	ug/L
108-90-7	Chlorobenzene	5.00 U	5.00	ug/L
75-00-3	Chloroethane	5.00 U	5.00	ug/L
67-66-3	Chloroform	5.00 U	5.00	ug/L

Sample Results

OW-1

Collect Date	04/02/2015 16:15	**GCAL ID**	21504041802
Receive Date	04/04/2015 09:45	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	04/09/2015 11:07	LBH	555919

CAS#	Parameter	Result	LOQ	Units
74-87-3	Chloromethane	5.00 U	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	5.00 U	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	5.00 U	5.00	ug/L
110-82-7	Cyclohexane	5.00 U	5.00	ug/L
124-48-1	Dibromochloromethane	5.00 U	5.00	ug/L
75-71-8	Dichlorodifluoromethane	5.00 U	5.00	ug/L
100-41-4	Ethylbenzene	5.00 U	5.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	5.00 U	5.00	ug/L
79-20-9	**Methyl Acetate**	**9.71**	**5.00**	**ug/L**
108-87-2	Methylcyclohexane	5.00 U	5.00	ug/L
75-09-2	Methylene chloride	5.00 U	5.00	ug/L
100-42-5	Styrene	5.00 U	5.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	5.00 U	5.00	ug/L
127-18-4	**Tetrachloroethene**	**15.1**	**5.00**	**ug/L**
108-88-3	Toluene	5.00 U	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	5.00 U	5.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	5.00 U	5.00	ug/L
79-01-6	**Trichloroethene**	**392**	**5.00**	**ug/L**
75-69-4	Trichlorofluoromethane	5.00 U	5.00	ug/L
76-13-1	Trichlorotrifluoroethane	5.00 U	5.00	ug/L
75-01-4	Vinyl chloride	5.00 U	5.00	ug/L
1330-20-7	Xylene (total)	5.00 U	5.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	250	245	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	250	263	ug/L	105	77 - 127
2037-26-5	Toluene d8	250	257	ug/L	103	76 - 134
17060-07-0	1,2-Dichloroethane-d4	250	269	ug/L	108	71 - 127

GC/MS Volatiles QC Summary

Analytical Batch 555919	Client ID	MB555919		LCS555919				LCSD555919				
	GCAL ID	1432691		1432692				1432693				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	04/09/2015 09:41		04/09/2015 08:18				04/09/2015 08:41				
	Matrix	Water		Water				Water				
EPA 8260B		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,1,1-Trichloroethane	71-55-6	1.00U	1.00	50.0	52.9	106	76 - 126	50.0	57.1	114	8	30
1,1,2,2-Tetrachloroethane	79-34-5	1.00U	1.00	50.0	54.7	109	70 - 122	50.0	55.4	111	1	30
1,1,2-Trichloroethane	79-00-5	1.00U	1.00	50.0	51.1	102	72 - 121	50.0	52.7	105	3	30
1,1-Dichloroethane	75-34-3	1.00U	1.00	50.0	52.0	104	74 - 127	50.0	56.4	113	8	30
1,1-Dichloroethene	75-35-4	1.00U	1.00	50.0	50.9	102	69 - 129	50.0	56.5	113	10	20
1,2,4-Trichlorobenzene	120-82-1	1.00U	1.00	50.0	57.9	116	61 - 135	50.0	60.7	121	5	30
1,2-Dibromo-3-chloropropane	96-12-8	1.00U	1.00	50.0	56.5	113	57 - 121	50.0	57.3	115	1	30
1,2-Dibromoethane	106-93-4	1.00U	1.00	50.0	52.3	105	70 - 124	50.0	53.0	106	1	30
1,2-Dichlorobenzene	95-50-1	1.00U	1.00	50.0	52.5	105	71 - 126	50.0	55.3	111	5	30
1,2-Dichloroethane	107-06-2	1.00U	1.00	50.0	51.4	103	71 - 129	50.0	53.7	107	4	30
1,2-Dichloropropane	78-87-5	1.00U	1.00	50.0	52.9	106	72 - 128	50.0	56.3	113	6	30
1,3-Dichlorobenzene	541-73-1	1.00U	1.00	50.0	52.6	105	74 - 126	50.0	56.0	112	6	30
1,4-Dichlorobenzene	106-46-7	1.00U	1.00	50.0	51.9	104	72 - 122	50.0	55.1	110	6	30
2-Butanone	78-93-3	1.00U	1.00	50.0	61.2	122	58 - 137	50.0	63.5	127	4	30
2-Hexanone	591-78-6	1.00U	1.00	50.0	53.3	107	50 - 135	50.0	55.3	111	4	30
4-Methyl-2-pentanone	108-10-1	1.00U	1.00	50.0	55.5	111	57 - 132	50.0	56.8	114	2	30
Acetone	67-64-1	1.00U	1.00	50.0	66.9	134	44 - 156	50.0	69.9	140	4	30
Benzene	71-43-2	1.00U	1.00	50.0	53.2	106	70 - 129	50.0	56.8	114	7	20
Bromodichloromethane	75-27-4	1.00U	1.00	50.0	53.2	106	74 - 125	50.0	56.5	113	6	30
Bromoform	75-25-2	1.00U	1.00	50.0	53.6	107	64 - 122	50.0	54.0	108	1	30
Bromomethane	74-83-9	1.00U	1.00	50.0	37.2	74	47 - 138	50.0	44.7	89	18	30
Carbon disulfide	75-15-0	1.00U	1.00	50.0	53.2	106	69 - 136	50.0	58.5	117	9	30
Carbon tetrachloride	56-23-5	1.00U	1.00	50.0	60.1	120	76 - 128	50.0	64.1	128	6	30
Chlorobenzene	108-90-7	1.00U	1.00	50.0	51.4	103	74 - 123	50.0	54.4	109	6	20
Chloroethane	75-00-3	1.00U	1.00	50.0	52.6	105	62 - 141	50.0	57.2	114	8	30
Chloroform	67-66-3	1.00U	1.00	50.0	51.6	103	75 - 122	50.0	55.1	110	7	30
Chloromethane	74-87-3	1.00U	1.00	50.0	41.6	83	59 - 132	50.0	44.4	89	7	30
cis-1,2-Dichloroethene	156-59-2	1.00U	1.00	50.0	52.4	105	73 - 130	50.0	56.3	113	7	30
cis-1,3-Dichloropropene	10061-01-5	1.00U	1.00	50.0	56.6	113	71 - 132	50.0	57.8	116	2	30
Cyclohexane	110-82-7	1.00U	1.00	50.0	48.0	96	69 - 132	50.0	52.4	105	9	30
Dibromochloromethane	124-48-1	1.00U	1.00	50.0	52.3	105	71 - 123	50.0	54.6	109	4	30
Dichlorodifluoromethane	75-71-8	1.00U	1.00	50.0	48.0	96	58 - 140	50.0	53.1	106	10	30
Ethylbenzene	100-41-4	1.00U	1.00	50.0	53.1	106	74 - 126	50.0	56.9	114	7	30
Isopropylbenzene (Cumene)	98-82-8	1.00U	1.00	50.0	55.7	111	71 - 125	50.0	59.9	120	7	30
Methyl Acetate	79-20-9	1.00U	1.00	50.0	53.3	107	57 - 139	50.0	56.0	112	5	30
Methylcyclohexane	108-87-2	1.00U	1.00	50.0	47.6	95	67 - 138	50.0	52.0	104	9	30
Methylene chloride	75-09-2	1.00U	1.00	50.0	50.2	100	68 - 132	50.0	53.0	106	5	30
Styrene	100-42-5	1.00U	1.00	50.0	55.8	112	71 - 127	50.0	58.8	118	5	30
tert-Butyl methyl ether (MTBE)	1634-04-4	1.00U	1.00	50.0	52.5	105	71 - 125	50.0	54.2	108	3	30
Tetrachloroethene	127-18-4	1.00U	1.00	50.0	50.3	101	68 - 128	50.0	55.1	110	9	30
Toluene	108-88-3	1.00U	1.00	50.0	51.4	103	72 - 120	50.0	55.2	110	7	20
trans-1,2-Dichloroethene	156-60-5	1.00U	1.00	50.0	52.3	105	69 - 132	50.0	56.3	113	7	30
trans-1,3-Dichloropropene	10061-02-6	1.00U	1.00	50.0	56.3	113	71 - 131	50.0	57.2	114	2	30
Trichloroethene	79-01-6	1.00U	1.00	50.0	50.5	101	76 - 129	50.0	55.1	110	9	20
Trichlorofluoromethane	75-69-4	1.00U	1.00	50.0	52.7	105	72 - 136	50.0	57.5	115	9	30
Trichlorotrifluoroethane	76-13-1	1.00U	1.00	50.0	51.0	102	72 - 136	50.0	56.5	113	10	30
Vinyl chloride	75-01-4	1.00U	1.00	50.0	51.7	103	68 - 132	50.0	56.8	114	9	30
Xylene (total)	1330-20-7	1.00U	1.00	150	164	109	74 - 127	150	174	116	6	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	51.9	104	50	50.2	100	71 - 127	50	50.9	102	1	NA
4-Bromofluorobenzene	460-00-4	48.1	96	50	49.3	99	78 - 130	50	49.1	98	0	NA
Dibromofluoromethane	1868-53-7	52	104	50	50	100	77 - 127	50	50.1	100	0	NA
Toluene d8	2037-26-5	50.8	102	50	49.2	98	76 - 134	50	49.2	98	0	NA

GCAL ANALYTICAL LABORATORIES, LLC

CHAIN OF CUSTODY RECORD

7979 Innovation Park Dr., Baton Rouge, LA 70820-7402
Phone: 225.769.4900 • Fax: 225.767.5717 • www.gcal.com

Client ID: 4783 - ERM NC, INC
SDG: 215040418
Due Date: 04/10/15

Report to:	**Bill to:**
Client: ERM NC, Inc.	Client:
Address: 15720 Brixham Hill Ave. Charlotte, NC 28277	Address:
Contact: Michael Pressley	Contact: SAME
Phone: 704 541 8345	Phone:
E-mail: Michael.pressley@erm.com	E-mail:

P.O. Number | Project Name/Number

Sampled By:

Analytical Requests & Method: VOCs by 8260

GCAL use only:
Custody Seal
used ☐ yes ☐ no
intact ☐ yes ☐ no
Temperature °C 1.8E24

☐ Dissolved Analysis Requested
☐ Field filtered
☐ Lab filtered

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No Containers	HCl	Preservative
W	4-2-15	1550		X	MW-3	3	X	1
W	"	1615		X	OW-1	3	X	2

Air Bill No: 807148550610

Turn Around Time (Business Days): ☐ 24h* ☐ 48h* ☐ 3 days* ☐ 1 week* ☒ Standard (Per Contract/Quote)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
[signature]	4-3-15	1600			
FedEx	4-4-15	9:45	Dodi McCune	4-4-15	9:45

Note:

By submitting these samples, you agree to GCAL's terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = solid, L = liquid, T = tissue

*Requires prior approval, rush charges may apply.

We cannot accept verbal changes. Please email written changes to your PM.

WHITE: CLIENT FINAL REPORT - CANARY: CLIENT

Revision 1

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

215040418

SAMPLE DELIVERY GROUP 215040418	
Client 4783 - ERM NC, INC	**Transport Method** FEDEX
Profile Number 241445	**Received By** McCune, Dodie N.
Line Item(s) 3 - Water - VOC/Na,Mn/Cl	**Receive Date(s)** 04/04/15

CHECKLIST	YES	NO	NA
Were all samples received using proper thermal preservation?	☑	☐	☐
When used, were all custody seals intact?	☑	☐	☐
Were all samples received in proper containers?	☑	☐	☐
Were all samples received using proper chemical preservation?	☑	☐	☐
Was preservative added to any container at the lab?	☐	☑	☐
Were all containers received in good condition?	☑	☐	☐
Were all VOA vials received with no head space?	☑	☐	☐
Do all sample labels match the Chain of Custody?	☐	☑	☐
Did the Chain of Custody list the sampling technician?	☑	☐	☐
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☐	☑	☐

COOLERS

Airbill	Thermometer ID: E24	Temp(°C)
807148550610		1.8

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.4

Page 1 of 1

Appendix A-4
1-Year Monitoring Event

ANALYTICAL RESULTS

PERFORMED BY

GCAL, LLC
7979 Innovation Park Dr.
Baton Rouge, LA 70820

Report Date 08/31/2015

GCAL Report 215070937

Project 0253066 / Joslyn Clark

Deliver To
Michael Pressley
ERM NC, Inc
15720 Brixham Hill Avenue
Suite 120
Charlotte, NC 28277
704 409 3450

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
DL	Diluted analysis – when appended to Client Sample ID
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
N	Metals Matrix Spike or Matrix Spike Duplicate Recovery is outside control limits
00:00	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
U	Indicates the compound was analyzed for but not detected
B	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____
Authorized Signature
GCAL Report 215070937

Case Narrative

Client: ERM NC, INC **Report:** 215070937

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

This report was revised 08/31/15. The data is revised to report non-detects as LOQ U. Additionally J values are not reported.

VOLATILES MASS SPECTROMETRY

In the EPA 8260B analysis for analytical batch 562942, the %D/%Drift is outside ± 30% for Chloroethane in the CCV. The response is high and this analyte was not detected in the associated samples.

In the EPA 8260B analysis, samples 21507093711 (MW-7), 21507093712 (MW-11D), 21507093713 (MW-11), 21507093714 (DUP-1), 21507093715 (DUP-2), 21507093716 (MW-11I), 21507093717 (MW-9) and 21507093722 (OW-1) had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. The dilution is reflected in elevated detection limits.

In the EPA 8260B analysis for analytical batch 562849, the LCS and/or LCSD recoveries are above the upper control limit for 1 and2-Dibromo-3-chloropropane. This compound was not detected in the associated samples.

In the EPA 8260B analysis for analytical batch 562665, Methylene chloride was above the reporting limit in the method blank, however, this analyte was not detected in the associated samples.

METALS

In the EPA 6020A analysis, samples 21507093722 (OW-1), 21507093724 (IW-2B), 21507093725 (IW-2A), 21507093726 (IW-1B), 21507093727 (IW-1A) and 21507093723 (MW-3) had to be diluted in order to bracket the concentration within the calibration range of the instrument.

CONVENTIONALS

In the EPA 300.0 and Rev 2.1 analysis, samples 21507093721 (MW-2), 21507093722 (OW-1), 21507093723 (MW-3), 21507093724 (IW-2B), 21507093725 (IW-2A), 21507093727 (IW-1A) and 21507093726 (IW-1B) had to be diluted in order to bracket the concentration within the calibration range of the instrument.

Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21507093701	MW-1	Water	07/06/2015 14:05	07/09/2015 10:13
21507093702	MW-4	Water	07/06/2015 14:55	07/09/2015 10:13
21507093703	MW-5	Water	07/06/2015 15:50	07/09/2015 10:13
21507093704	MW-12D	Water	07/06/2015 16:50	07/09/2015 10:13
21507093705	MW-12	Water	07/06/2015 17:45	07/09/2015 10:13
21507093706	MW-10D	Water	07/07/2015 07:45	07/09/2015 10:13
21507093707	MW-10	Water	07/07/2015 08:30	07/09/2015 10:13
21507093708	MW-8	Water	07/07/2015 09:35	07/09/2015 10:13
21507093709	MW-6	Water	07/07/2015 10:25	07/09/2015 10:13
21507093710	MW-3D	Water	07/07/2015 11:15	07/09/2015 10:13
21507093711	MW-7	Water	07/07/2015 12:20	07/09/2015 10:13
21507093712	MW-11D	Water	07/07/2015 15:30	07/09/2015 10:13
21507093713	MW-11	Water	07/07/2015 16:20	07/09/2015 10:13
21507093714	DUP-1	Water	07/07/2015 00:00	07/09/2015 10:13
21507093715	DUP-2	Water	07/07/2015 00:00	07/09/2015 10:13
21507093716	MW-11I	Water	07/07/2015 17:15	07/09/2015 10:13
21507093717	MW-9	Water	07/08/2015 10:10	07/09/2015 10:13
21507093718	EQ-RINSE-1	Water	07/07/2015 18:00	07/09/2015 10:13
21507093719	EQ-RINSE-2	Water	07/08/2015 13:30	07/09/2015 10:13
21507093720	TRIP BLANK	Water	07/06/2015 00:00	07/09/2015 10:13
21507093721	MW-2	Water	07/07/2015 14:20	07/09/2015 10:13
21507093722	OW-1	Water	07/08/2015 08:35	07/09/2015 10:13
21507093723	MW-3	Water	07/08/2015 11:10	07/09/2015 10:13
21507093724	IW-2B	Water	07/08/2015 11:35	07/09/2015 10:13
21507093725	IW-2A	Water	07/08/2015 11:55	07/09/2015 10:13
21507093726	IW-1B	Water	07/08/2015 12:20	07/09/2015 10:13
21507093727	IW-1A	Water	07/08/2015 12:55	07/09/2015 10:13

Summary of Compounds Detected

MW-12D

Collect Date	07/06/2015 16:50	**GCAL ID**	21507093704
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
75-35-4	1,1-Dichloroethene	12.3	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	3.81	1.00	ug/L
127-18-4	Tetrachloroethene	16.2	1.00	ug/L
79-01-6	Trichloroethene	146	1.00	ug/L

MW-12

Collect Date	07/06/2015 17:45	**GCAL ID**	21507093705
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
79-01-6	Trichloroethene	4.35	1.00	ug/L

MW-3D

Collect Date	07/07/2015 11:15	**GCAL ID**	21507093710
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
75-35-4	1,1-Dichloroethene	3.88	1.00	ug/L
79-01-6	Trichloroethene	29.0	1.00	ug/L

MW-7

Collect Date	07/07/2015 12:20	**GCAL ID**	21507093711
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
67-66-3	Chloroform	2.70	2.00	ug/L
156-59-2	cis-1,2-Dichloroethene	5.51	2.00	ug/L
127-18-4	Tetrachloroethene	8.83	2.00	ug/L
79-01-6	Trichloroethene	301	2.00	ug/L

Summary of Compounds Detected

MW-11D

Collect Date	07/07/2015 15:30	**GCAL ID**	21507093712
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
79-01-6	Trichloroethene	242	2.00	ug/L

MW-11

Collect Date	07/07/2015 16:20	**GCAL ID**	21507093713
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
75-35-4	1,1-Dichloroethene	105	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	11.1	5.00	ug/L
127-18-4	Tetrachloroethene	22.8	5.00	ug/L
79-01-6	Trichloroethene	480	5.00	ug/L

DUP-1

Collect Date	07/07/2015 00:00	**GCAL ID**	21507093714
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
67-66-3	Chloroform	2.65	2.00	ug/L
156-59-2	cis-1,2-Dichloroethene	6.10	2.00	ug/L
127-18-4	Tetrachloroethene	11.8	2.00	ug/L
79-01-6	Trichloroethene	364	2.00	ug/L

DUP-2

Collect Date	07/07/2015 00:00	**GCAL ID**	21507093715
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
75-35-4	1,1-Dichloroethene	83.3	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	10.6	5.00	ug/L
127-18-4	Tetrachloroethene	19.7	5.00	ug/L
79-01-6	Trichloroethene	455	5.00	ug/L

Summary of Compounds Detected

MW-11I

Collect Date 07/07/2015 17:15 **GCAL ID** 21507093716
Receive Date 07/09/2015 10:13 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
79-01-6	Trichloroethene	204	2.00	ug/L

MW-9

Collect Date 07/08/2015 10:10 **GCAL ID** 21507093717
Receive Date 07/09/2015 10:13 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
75-35-4	1,1-Dichloroethene	216	100	ug/L
156-59-2	cis-1,2-Dichloroethene	459	100	ug/L
127-18-4	Tetrachloroethene	1000	100	ug/L
79-01-6	Trichloroethene	16500	100	ug/L

MW-2

Collect Date 07/07/2015 14:20 **GCAL ID** 21507093721
Receive Date 07/09/2015 10:13 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
79-01-6	Trichloroethene	27.6	1.00	ug/L

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	15.2	5.00	ug/L
7440-23-5	Sodium	7500	100	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	11.4	1.00	mg/L

Summary of Compounds Detected

OW-1

Collect Date 07/08/2015 08:35 **GCAL ID** 21507093722
Receive Date 07/09/2015 10:13 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
75-34-3	1,1-Dichloroethane	6.29	5.00	ug/L
79-20-9	Methyl Acetate	10.8	5.00	ug/L
127-18-4	Tetrachloroethene	12.7	5.00	ug/L
79-01-6	Trichloroethene	514	5.00	ug/L

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	1100	500	ug/L
7440-23-5	Sodium	11000	10000	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	6.76	2.00	mg/L

MW-3

Collect Date 07/08/2015 11:10 **GCAL ID** 21507093723
Receive Date 07/09/2015 10:13 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
79-00-5	1,1,2-Trichloroethane	1.08	1.00	ug/L
75-34-3	1,1-Dichloroethane	5.79	1.00	ug/L
67-64-1	Acetone	15.2	1.00	ug/L
67-66-3	Chloroform	1.16	1.00	ug/L
79-20-9	Methyl Acetate	9.53	1.00	ug/L
79-01-6	Trichloroethene	13.9	1.00	ug/L

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	19300	500	ug/L
7440-23-5	Sodium	26900	10000	ug/L

Summary of Compounds Detected

MW-3

Collect Date 07/08/2015 11:10 **GCAL ID** 21507093723
Receive Date 07/09/2015 10:13 **Matrix** Water

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	7.08	2.00	mg/L

IW-2B

Collect Date 07/08/2015 11:35 **GCAL ID** 21507093724
Receive Date 07/09/2015 10:13 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
67-64-1	Acetone	8.44	1.00	ug/L
67-66-3	Chloroform	1.33	1.00	ug/L
79-20-9	Methyl Acetate	4.46	1.00	ug/L

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	39000	500	ug/L
7440-23-5	Sodium	770000	10000	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	28.9	10.0	mg/L

IW-2A

Collect Date 07/08/2015 11:55 **GCAL ID** 21507093725
Receive Date 07/09/2015 10:13 **Matrix** Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
75-34-3	1,1-Dichloroethane	1.00	1.00	ug/L

Summary of Compounds Detected

IW-2A

Collect Date	07/08/2015 11:55	**GCAL ID**	21507093725
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	2840	500	ug/L
7440-23-5	Sodium	862000	10000	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	17.9	4.00	mg/L

IW-1B

Collect Date	07/08/2015 12:20	**GCAL ID**	21507093726
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
75-34-3	1,1-Dichloroethane	1.19	1.00	ug/L
67-66-3	Chloroform	1.03	1.00	ug/L
79-20-9	Methyl Acetate	4.54	1.00	ug/L

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	13000	500	ug/L
7440-23-5	Sodium	624000	10000	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	17.4	10.0	mg/L

Summary of Compounds Detected

IW-1A				
	Collect Date	07/08/2015 12:55	GCAL ID	21507093727
	Receive Date	07/09/2015 10:13	Matrix	Water

EPA 8260B

CAS#	Parameter	Result	LOQ	Units
75-34-3	1,1-Dichloroethane	1.44	1.00	ug/L
79-20-9	Methyl Acetate	10.8	1.00	ug/L

EPA 6020A

CAS#	Parameter	Result	LOQ	Units
7439-96-5	Manganese	12100	500	ug/L
7440-23-5	Sodium	262000	10000	ug/L

EPA 300.0, Rev 2.1

CAS#	Parameter	Result	LOQ	Units
16887-00-6	Chloride	13.0	4.00	mg/L

Sample Results

MW-1	**Collect Date**	07/06/2015 14:05	**GCAL ID**	21507093701
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 18:31	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

MW-1

Collect Date	07/06/2015 14:05	**GCAL ID**	21507093701
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 18:31	CJR	562754

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	51.9	ug/L	104	78 - 130
1868-53-7	Dibromofluoromethane	50	52	ug/L	104	77 - 127
2037-26-5	Toluene d8	50	50	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	51.9	ug/L	104	71 - 127

MW-4

Collect Date	07/06/2015 14:55	**GCAL ID**	21507093702
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 18:52	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L

Sample Results

MW-4

Collect Date	07/06/2015 14:55	**GCAL ID**	21507093702
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 18:52	CJR	562754

CAS#	Parameter	Result	LOQ	Units
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	51.3	ug/L	103	78 - 130
1868-53-7	Dibromofluoromethane	50	52.7	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	50.8	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	53	ug/L	106	71 - 127

MW-5

Collect Date	07/06/2015 15:50	**GCAL ID**	21507093703
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 19:13	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L

Sample Results

MW-5	**Collect Date**	07/06/2015 15:50	**GCAL ID**	21507093703
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 19:13	CJR	562754

CAS#	Parameter	Result	LOQ	Units
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

MW-5

Collect Date	07/06/2015 15:50	**GCAL ID**	21507093703
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 19:13	CJR	562754

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	51.5	ug/L	103	78 - 130
1868-53-7	Dibromofluoromethane	50	52.4	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	50.1	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52.8	ug/L	106	71 - 127

MW-12D

Collect Date	07/06/2015 16:50	**GCAL ID**	21507093704
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 19:34	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	**1,1-Dichloroethene**	**12.3**	**1.00**	**ug/L**
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L

Sample Results

MW-12D

Collect Date	07/06/2015 16:50	**GCAL ID**	21507093704
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 19:34	CJR	562754

CAS#	Parameter	Result	LOQ	Units
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	**cis-1,2-Dichloroethene**	**3.81**	**1.00**	**ug/L**
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	**Tetrachloroethene**	**16.2**	**1.00**	**ug/L**
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	**Trichloroethene**	**146**	**1.00**	**ug/L**
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	51.1	ug/L	102	78 - 130
1868-53-7	Dibromofluoromethane	50	51.6	ug/L	103	77 - 127
2037-26-5	Toluene d8	50	49.5	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	51.1	ug/L	102	71 - 127

MW-12

Collect Date	07/06/2015 17:45	**GCAL ID**	21507093705
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 19:55	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L

Sample Results

MW-12	**Collect Date**	07/06/2015 17:45	**GCAL ID**	21507093705
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 19:55	CJR	562754

CAS#	Parameter	Result	LOQ	Units
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	**Trichloroethene**	**4.35**	**1.00**	**ug/L**
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

MW-12

Collect Date	07/06/2015 17:45	**GCAL ID**	21507093705
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 19:55	CJR	562754

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	51	ug/L	102	78 - 130
1868-53-7	Dibromofluoromethane	50	51.6	ug/L	103	77 - 127
2037-26-5	Toluene d8	50	49.5	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52.3	ug/L	105	71 - 127

MW-10D

Collect Date	07/07/2015 07:45	**GCAL ID**	21507093706
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 20:16	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L

Sample Results

MW-10D

Collect Date	07/07/2015 07:45	**GCAL ID**	21507093706
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 20:16	CJR	562754

CAS#	Parameter	Result	LOQ	Units
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	51.1	ug/L	102	78 - 130
1868-53-7	Dibromofluoromethane	50	51.5	ug/L	103	77 - 127
2037-26-5	Toluene d8	50	49.5	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	50.7	ug/L	101	71 - 127

MW-10

Collect Date	07/07/2015 08:30	**GCAL ID**	21507093707
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 23:32	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L

Sample Results

MW-10	**Collect Date**	07/07/2015 08:30	**GCAL ID**	21507093707
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 23:32	CJR	562754

CAS#	Parameter	Result	LOQ	Units
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

MW-10

Collect Date	07/07/2015 08:30	**GCAL ID**	21507093707
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 23:32	CJR	562754

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.9	ug/L	102	78 - 130
1868-53-7	Dibromofluoromethane	50	52.5	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	49.2	ug/L	98	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52	ug/L	104	71 - 127

MW-8

Collect Date	07/07/2015 09:35	**GCAL ID**	21507093708
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 21:18	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L

Sample Results

MW-8

Collect Date	07/07/2015 09:35	**GCAL ID**	21507093708
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 21:18	CJR	562754

CAS#	Parameter	Result	LOQ	Units
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.3	ug/L	101	78 - 130
1868-53-7	Dibromofluoromethane	50	52.8	ug/L	106	77 - 127
2037-26-5	Toluene d8	50	49.8	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	51.6	ug/L	103	71 - 127

MW-6

Collect Date	07/07/2015 10:25	**GCAL ID**	21507093709
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 21:39	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L

Sample Results

MW-6	**Collect Date**	07/07/2015 10:25	**GCAL ID**	21507093709
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 21:39	CJR	562754

CAS#	Parameter	Result	LOQ	Units
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

MW-6

Collect Date	07/07/2015 10:25	**GCAL ID**	21507093709
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 21:39	CJR	562754

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	50.6	ug/L	101	78 - 130
1868-53-7	Dibromofluoromethane	50	53.1	ug/L	106	77 - 127
2037-26-5	Toluene d8	50	50	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52.3	ug/L	105	71 - 127

MW-3D

Collect Date	07/07/2015 11:15	**GCAL ID**	21507093710
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 22:00	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	**1,1-Dichloroethene**	**3.88**	**1.00**	**ug/L**
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L

Sample Results

MW-3D

Collect Date	07/07/2015 11:15	**GCAL ID**	21507093710
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/10/2015 22:00	CJR	562754

CAS#	Parameter	Result	LOQ	Units
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	**Trichloroethene**	**29.0**	**1.00**	**ug/L**
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49.7	ug/L	99	78 - 130
1868-53-7	Dibromofluoromethane	50	52.4	ug/L	105	77 - 127
2037-26-5	Toluene d8	50	49.1	ug/L	98	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52.1	ug/L	104	71 - 127

MW-7

Collect Date	07/07/2015 12:20	**GCAL ID**	21507093711
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	07/10/2015 22:24	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	2.00 U	2.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	2.00 U	2.00	ug/L
79-00-5	1,1,2-Trichloroethane	2.00 U	2.00	ug/L
75-34-3	1,1-Dichloroethane	2.00 U	2.00	ug/L
75-35-4	1,1-Dichloroethene	2.00 U	2.00	ug/L

Sample Results

MW-7	**Collect Date**	07/07/2015 12:20	**GCAL ID**	21507093711
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	07/10/2015 22:24	CJR	562754

CAS#	Parameter	Result	LOQ	Units
120-82-1	1,2,4-Trichlorobenzene	2.00 U	2.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	2.00 U	2.00	ug/L
106-93-4	1,2-Dibromoethane	2.00 U	2.00	ug/L
95-50-1	1,2-Dichlorobenzene	2.00 U	2.00	ug/L
107-06-2	1,2-Dichloroethane	2.00 U	2.00	ug/L
78-87-5	1,2-Dichloropropane	2.00 U	2.00	ug/L
541-73-1	1,3-Dichlorobenzene	2.00 U	2.00	ug/L
106-46-7	1,4-Dichlorobenzene	2.00 U	2.00	ug/L
78-93-3	2-Butanone	2.00 U	2.00	ug/L
591-78-6	2-Hexanone	2.00 U	2.00	ug/L
108-10-1	4-Methyl-2-pentanone	2.00 U	2.00	ug/L
67-64-1	Acetone	2.00 U	2.00	ug/L
71-43-2	Benzene	2.00 U	2.00	ug/L
75-27-4	Bromodichloromethane	2.00 U	2.00	ug/L
75-25-2	Bromoform	2.00 U	2.00	ug/L
74-83-9	Bromomethane	2.00 U	2.00	ug/L
75-15-0	Carbon disulfide	2.00 U	2.00	ug/L
56-23-5	Carbon tetrachloride	2.00 U	2.00	ug/L
108-90-7	Chlorobenzene	2.00 U	2.00	ug/L
75-00-3	Chloroethane	2.00 U	2.00	ug/L
67-66-3	**Chloroform**	**2.70**	**2.00**	**ug/L**
74-87-3	Chloromethane	2.00 U	2.00	ug/L
156-59-2	**cis-1,2-Dichloroethene**	**5.51**	**2.00**	**ug/L**
10061-01-5	cis-1,3-Dichloropropene	2.00 U	2.00	ug/L
110-82-7	Cyclohexane	2.00 U	2.00	ug/L
124-48-1	Dibromochloromethane	2.00 U	2.00	ug/L
75-71-8	Dichlorodifluoromethane	2.00 U	2.00	ug/L
100-41-4	Ethylbenzene	2.00 U	2.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	2.00 U	2.00	ug/L
79-20-9	Methyl Acetate	2.00 U	2.00	ug/L
108-87-2	Methylcyclohexane	2.00 U	2.00	ug/L
75-09-2	Methylene chloride	2.00 U	2.00	ug/L
100-42-5	Styrene	2.00 U	2.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	2.00 U	2.00	ug/L
127-18-4	**Tetrachloroethene**	**8.83**	**2.00**	**ug/L**
108-88-3	Toluene	2.00 U	2.00	ug/L
156-60-5	trans-1,2-Dichloroethene	2.00 U	2.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	2.00 U	2.00	ug/L
79-01-6	**Trichloroethene**	**301**	**2.00**	**ug/L**
75-69-4	Trichlorofluoromethane	2.00 U	2.00	ug/L
76-13-1	Trichlorotrifluoroethane	2.00 U	2.00	ug/L
75-01-4	Vinyl chloride	2.00 U	2.00	ug/L

Sample Results

MW-7

Collect Date	07/07/2015 12:20	**GCAL ID**	21507093711
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	07/10/2015 22:24	CJR	562754

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	2.00 U	2.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	100	100	ug/L	100	78 - 130
1868-53-7	Dibromofluoromethane	100	106	ug/L	106	77 - 127
2037-26-5	Toluene d8	100	99.9	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	100	104	ug/L	104	71 - 127

MW-11D

Collect Date	07/07/2015 15:30	**GCAL ID**	21507093712
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	07/10/2015 22:47	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	2.00 U	2.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	2.00 U	2.00	ug/L
79-00-5	1,1,2-Trichloroethane	2.00 U	2.00	ug/L
75-34-3	1,1-Dichloroethane	2.00 U	2.00	ug/L
75-35-4	1,1-Dichloroethene	2.00 U	2.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	2.00 U	2.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	2.00 U	2.00	ug/L
106-93-4	1,2-Dibromoethane	2.00 U	2.00	ug/L
95-50-1	1,2-Dichlorobenzene	2.00 U	2.00	ug/L
107-06-2	1,2-Dichloroethane	2.00 U	2.00	ug/L
78-87-5	1,2-Dichloropropane	2.00 U	2.00	ug/L
541-73-1	1,3-Dichlorobenzene	2.00 U	2.00	ug/L
106-46-7	1,4-Dichlorobenzene	2.00 U	2.00	ug/L
78-93-3	2-Butanone	2.00 U	2.00	ug/L
591-78-6	2-Hexanone	2.00 U	2.00	ug/L
108-10-1	4-Methyl-2-pentanone	2.00 U	2.00	ug/L
67-64-1	Acetone	2.00 U	2.00	ug/L
71-43-2	Benzene	2.00 U	2.00	ug/L
75-27-4	Bromodichloromethane	2.00 U	2.00	ug/L
75-25-2	Bromoform	2.00 U	2.00	ug/L
74-83-9	Bromomethane	2.00 U	2.00	ug/L
75-15-0	Carbon disulfide	2.00 U	2.00	ug/L
56-23-5	Carbon tetrachloride	2.00 U	2.00	ug/L
108-90-7	Chlorobenzene	2.00 U	2.00	ug/L
75-00-3	Chloroethane	2.00 U	2.00	ug/L
67-66-3	Chloroform	2.00 U	2.00	ug/L

Sample Results

MW-11D

Collect Date	07/07/2015 15:30	**GCAL ID**	21507093712
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	07/10/2015 22:47	CJR	562754

CAS#	Parameter	Result	LOQ	Units
74-87-3	Chloromethane	2.00 U	2.00	ug/L
156-59-2	cis-1,2-Dichloroethene	2.00 U	2.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	2.00 U	2.00	ug/L
110-82-7	Cyclohexane	2.00 U	2.00	ug/L
124-48-1	Dibromochloromethane	2.00 U	2.00	ug/L
75-71-8	Dichlorodifluoromethane	2.00 U	2.00	ug/L
100-41-4	Ethylbenzene	2.00 U	2.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	2.00 U	2.00	ug/L
79-20-9	Methyl Acetate	2.00 U	2.00	ug/L
108-87-2	Methylcyclohexane	2.00 U	2.00	ug/L
75-09-2	Methylene chloride	2.00 U	2.00	ug/L
100-42-5	Styrene	2.00 U	2.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	2.00 U	2.00	ug/L
127-18-4	Tetrachloroethene	2.00 U	2.00	ug/L
108-88-3	Toluene	2.00 U	2.00	ug/L
156-60-5	trans-1,2-Dichloroethene	2.00 U	2.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	2.00 U	2.00	ug/L
79-01-6	**Trichloroethene**	**242**	**2.00**	**ug/L**
75-69-4	Trichlorofluoromethane	2.00 U	2.00	ug/L
76-13-1	Trichlorotrifluoroethane	2.00 U	2.00	ug/L
75-01-4	Vinyl chloride	2.00 U	2.00	ug/L
1330-20-7	Xylene (total)	2.00 U	2.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	100	101	ug/L	101	78 - 130
1868-53-7	Dibromofluoromethane	100	106	ug/L	106	77 - 127
2037-26-5	Toluene d8	100	99	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	100	107	ug/L	107	71 - 127

MW-11

Collect Date	07/07/2015 16:20	**GCAL ID**	21507093713
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	07/10/2015 23:11	CJR	562754

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	5.00 U	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	5.00 U	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	5.00 U	5.00	ug/L
75-34-3	1,1-Dichloroethane	5.00 U	5.00	ug/L
75-35-4	**1,1-Dichloroethene**	**105**	**5.00**	**ug/L**

Sample Results

MW-11	**Collect Date**	07/07/2015 16:20	**GCAL ID**	21507093713
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	07/10/2015 23:11	CJR	562754

CAS#	Parameter	Result	LOQ	Units
120-82-1	1,2,4-Trichlorobenzene	5.00 U	5.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	5.00 U	5.00	ug/L
106-93-4	1,2-Dibromoethane	5.00 U	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	5.00 U	5.00	ug/L
107-06-2	1,2-Dichloroethane	5.00 U	5.00	ug/L
78-87-5	1,2-Dichloropropane	5.00 U	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	5.00 U	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	5.00 U	5.00	ug/L
78-93-3	2-Butanone	5.00 U	5.00	ug/L
591-78-6	2-Hexanone	5.00 U	5.00	ug/L
108-10-1	4-Methyl-2-pentanone	5.00 U	5.00	ug/L
67-64-1	Acetone	5.00 U	5.00	ug/L
71-43-2	Benzene	5.00 U	5.00	ug/L
75-27-4	Bromodichloromethane	5.00 U	5.00	ug/L
75-25-2	Bromoform	5.00 U	5.00	ug/L
74-83-9	Bromomethane	5.00 U	5.00	ug/L
75-15-0	Carbon disulfide	5.00 U	5.00	ug/L
56-23-5	Carbon tetrachloride	5.00 U	5.00	ug/L
108-90-7	Chlorobenzene	5.00 U	5.00	ug/L
75-00-3	Chloroethane	5.00 U	5.00	ug/L
67-66-3	Chloroform	5.00 U	5.00	ug/L
74-87-3	Chloromethane	5.00 U	5.00	ug/L
156-59-2	**cis-1,2-Dichloroethene**	**11.1**	**5.00**	**ug/L**
10061-01-5	cis-1,3-Dichloropropene	5.00 U	5.00	ug/L
110-82-7	Cyclohexane	5.00 U	5.00	ug/L
124-48-1	Dibromochloromethane	5.00 U	5.00	ug/L
75-71-8	Dichlorodifluoromethane	5.00 U	5.00	ug/L
100-41-4	Ethylbenzene	5.00 U	5.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	5.00 U	5.00	ug/L
79-20-9	Methyl Acetate	5.00 U	5.00	ug/L
108-87-2	Methylcyclohexane	5.00 U	5.00	ug/L
75-09-2	Methylene chloride	5.00 U	5.00	ug/L
100-42-5	Styrene	5.00 U	5.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	5.00 U	5.00	ug/L
127-18-4	**Tetrachloroethene**	**22.8**	**5.00**	**ug/L**
108-88-3	Toluene	5.00 U	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	5.00 U	5.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	5.00 U	5.00	ug/L
79-01-6	**Trichloroethene**	**480**	**5.00**	**ug/L**
75-69-4	Trichlorofluoromethane	5.00 U	5.00	ug/L
76-13-1	Trichlorotrifluoroethane	5.00 U	5.00	ug/L
75-01-4	Vinyl chloride	5.00 U	5.00	ug/L

Sample Results

MW-11

Collect Date	07/07/2015 16:20	**GCAL ID**	21507093713
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	07/10/2015 23:11	CJR	562754

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	5.00 U	5.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	250	255	ug/L	102	78 - 130
1868-53-7	Dibromofluoromethane	250	265	ug/L	106	77 - 127
2037-26-5	Toluene d8	250	250	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	250	263	ug/L	105	71 - 127

DUP-1

Collect Date	07/07/2015 00:00	**GCAL ID**	21507093714
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	07/11/2015 18:48	CJR	562849

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	2.00 U	2.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	2.00 U	2.00	ug/L
79-00-5	1,1,2-Trichloroethane	2.00 U	2.00	ug/L
75-34-3	1,1-Dichloroethane	2.00 U	2.00	ug/L
75-35-4	1,1-Dichloroethene	2.00 U	2.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	2.00 U	2.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	2.00 U	2.00	ug/L
106-93-4	1,2-Dibromoethane	2.00 U	2.00	ug/L
95-50-1	1,2-Dichlorobenzene	2.00 U	2.00	ug/L
107-06-2	1,2-Dichloroethane	2.00 U	2.00	ug/L
78-87-5	1,2-Dichloropropane	2.00 U	2.00	ug/L
541-73-1	1,3-Dichlorobenzene	2.00 U	2.00	ug/L
106-46-7	1,4-Dichlorobenzene	2.00 U	2.00	ug/L
78-93-3	2-Butanone	2.00 U	2.00	ug/L
591-78-6	2-Hexanone	2.00 U	2.00	ug/L
108-10-1	4-Methyl-2-pentanone	2.00 U	2.00	ug/L
67-64-1	Acetone	2.00 U	2.00	ug/L
71-43-2	Benzene	2.00 U	2.00	ug/L
75-27-4	Bromodichloromethane	2.00 U	2.00	ug/L
75-25-2	Bromoform	2.00 U	2.00	ug/L
74-83-9	Bromomethane	2.00 U	2.00	ug/L
75-15-0	Carbon disulfide	2.00 U	2.00	ug/L
56-23-5	Carbon tetrachloride	2.00 U	2.00	ug/L
108-90-7	Chlorobenzene	2.00 U	2.00	ug/L
75-00-3	Chloroethane	2.00 U	2.00	ug/L
67-66-3	**Chloroform**	**2.65**	**2.00**	**ug/L**

Sample Results

DUP-1

Collect Date	07/07/2015 00:00	**GCAL ID**	21507093714
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	07/11/2015 18:48	CJR	562849

CAS#	Parameter	Result	LOQ	Units
74-87-3	Chloromethane	2.00 U	2.00	ug/L
156-59-2	**cis-1,2-Dichloroethene**	**6.10**	**2.00**	**ug/L**
10061-01-5	cis-1,3-Dichloropropene	2.00 U	2.00	ug/L
110-82-7	Cyclohexane	2.00 U	2.00	ug/L
124-48-1	Dibromochloromethane	2.00 U	2.00	ug/L
75-71-8	Dichlorodifluoromethane	2.00 U	2.00	ug/L
100-41-4	Ethylbenzene	2.00 U	2.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	2.00 U	2.00	ug/L
79-20-9	Methyl Acetate	2.00 U	2.00	ug/L
108-87-2	Methylcyclohexane	2.00 U	2.00	ug/L
75-09-2	Methylene chloride	2.00 U	2.00	ug/L
100-42-5	Styrene	2.00 U	2.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	2.00 U	2.00	ug/L
127-18-4	**Tetrachloroethene**	**11.8**	**2.00**	**ug/L**
108-88-3	Toluene	2.00 U	2.00	ug/L
156-60-5	trans-1,2-Dichloroethene	2.00 U	2.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	2.00 U	2.00	ug/L
79-01-6	**Trichloroethene**	**364**	**2.00**	**ug/L**
75-69-4	Trichlorofluoromethane	2.00 U	2.00	ug/L
76-13-1	Trichlorotrifluoroethane	2.00 U	2.00	ug/L
75-01-4	Vinyl chloride	2.00 U	2.00	ug/L
1330-20-7	Xylene (total)	2.00 U	2.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	100	90.9	ug/L	91	78 - 130
1868-53-7	Dibromofluoromethane	100	98.4	ug/L	98	77 - 127
2037-26-5	Toluene d8	100	102	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	100	102	ug/L	102	71 - 127

DUP-2

Collect Date	07/07/2015 00:00	**GCAL ID**	21507093715
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	07/11/2015 19:13	CJR	562849

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	5.00 U	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	5.00 U	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	5.00 U	5.00	ug/L
75-34-3	1,1-Dichloroethane	5.00 U	5.00	ug/L
75-35-4	**1,1-Dichloroethene**	**83.3**	**5.00**	**ug/L**

Sample Results

DUP-2

Collect Date	07/07/2015 00:00	**GCAL ID**	21507093715
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	07/11/2015 19:13	CJR	562849

CAS#	Parameter	Result	LOQ	Units
120-82-1	1,2,4-Trichlorobenzene	5.00 U	5.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	5.00 U	5.00	ug/L
106-93-4	1,2-Dibromoethane	5.00 U	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	5.00 U	5.00	ug/L
107-06-2	1,2-Dichloroethane	5.00 U	5.00	ug/L
78-87-5	1,2-Dichloropropane	5.00 U	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	5.00 U	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	5.00 U	5.00	ug/L
78-93-3	2-Butanone	5.00 U	5.00	ug/L
591-78-6	2-Hexanone	5.00 U	5.00	ug/L
108-10-1	4-Methyl-2-pentanone	5.00 U	5.00	ug/L
67-64-1	Acetone	5.00 U	5.00	ug/L
71-43-2	Benzene	5.00 U	5.00	ug/L
75-27-4	Bromodichloromethane	5.00 U	5.00	ug/L
75-25-2	Bromoform	5.00 U	5.00	ug/L
74-83-9	Bromomethane	5.00 U	5.00	ug/L
75-15-0	Carbon disulfide	5.00 U	5.00	ug/L
56-23-5	Carbon tetrachloride	5.00 U	5.00	ug/L
108-90-7	Chlorobenzene	5.00 U	5.00	ug/L
75-00-3	Chloroethane	5.00 U	5.00	ug/L
67-66-3	Chloroform	5.00 U	5.00	ug/L
74-87-3	Chloromethane	5.00 U	5.00	ug/L
156-59-2	**cis-1,2-Dichloroethene**	**10.6**	**5.00**	**ug/L**
10061-01-5	cis-1,3-Dichloropropene	5.00 U	5.00	ug/L
110-82-7	Cyclohexane	5.00 U	5.00	ug/L
124-48-1	Dibromochloromethane	5.00 U	5.00	ug/L
75-71-8	Dichlorodifluoromethane	5.00 U	5.00	ug/L
100-41-4	Ethylbenzene	5.00 U	5.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	5.00 U	5.00	ug/L
79-20-9	Methyl Acetate	5.00 U	5.00	ug/L
108-87-2	Methylcyclohexane	5.00 U	5.00	ug/L
75-09-2	Methylene chloride	5.00 U	5.00	ug/L
100-42-5	Styrene	5.00 U	5.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	5.00 U	5.00	ug/L
127-18-4	**Tetrachloroethene**	**19.7**	**5.00**	**ug/L**
108-88-3	Toluene	5.00 U	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	5.00 U	5.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	5.00 U	5.00	ug/L
79-01-6	**Trichloroethene**	**455**	**5.00**	**ug/L**
75-69-4	Trichlorofluoromethane	5.00 U	5.00	ug/L
76-13-1	Trichlorotrifluoroethane	5.00 U	5.00	ug/L
75-01-4	Vinyl chloride	5.00 U	5.00	ug/L

Sample Results

DUP-2

Collect Date	07/07/2015 00:00	**GCAL ID**	21507093715
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	07/11/2015 19:13	CJR	562849

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	5.00 U	5.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	250	227	ug/L	91	78 - 130
1868-53-7	Dibromofluoromethane	250	247	ug/L	99	77 - 127
2037-26-5	Toluene d8	250	260	ug/L	104	76 - 134
17060-07-0	1,2-Dichloroethane-d4	250	261	ug/L	104	71 - 127

MW-11I

Collect Date	07/07/2015 17:15	**GCAL ID**	21507093716
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	07/11/2015 19:39	CJR	562849

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	2.00 U	2.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	2.00 U	2.00	ug/L
79-00-5	1,1,2-Trichloroethane	2.00 U	2.00	ug/L
75-34-3	1,1-Dichloroethane	2.00 U	2.00	ug/L
75-35-4	1,1-Dichloroethene	2.00 U	2.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	2.00 U	2.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	2.00 U	2.00	ug/L
106-93-4	1,2-Dibromoethane	2.00 U	2.00	ug/L
95-50-1	1,2-Dichlorobenzene	2.00 U	2.00	ug/L
107-06-2	1,2-Dichloroethane	2.00 U	2.00	ug/L
78-87-5	1,2-Dichloropropane	2.00 U	2.00	ug/L
541-73-1	1,3-Dichlorobenzene	2.00 U	2.00	ug/L
106-46-7	1,4-Dichlorobenzene	2.00 U	2.00	ug/L
78-93-3	2-Butanone	2.00 U	2.00	ug/L
591-78-6	2-Hexanone	2.00 U	2.00	ug/L
108-10-1	4-Methyl-2-pentanone	2.00 U	2.00	ug/L
67-64-1	Acetone	2.00 U	2.00	ug/L
71-43-2	Benzene	2.00 U	2.00	ug/L
75-27-4	Bromodichloromethane	2.00 U	2.00	ug/L
75-25-2	Bromoform	2.00 U	2.00	ug/L
74-83-9	Bromomethane	2.00 U	2.00	ug/L
75-15-0	Carbon disulfide	2.00 U	2.00	ug/L
56-23-5	Carbon tetrachloride	2.00 U	2.00	ug/L
108-90-7	Chlorobenzene	2.00 U	2.00	ug/L
75-00-3	Chloroethane	2.00 U	2.00	ug/L
67-66-3	Chloroform	2.00 U	2.00	ug/L

Sample Results

MW-11I

Collect Date	07/07/2015 17:15	**GCAL ID**	21507093716
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	2	07/11/2015 19:39	CJR	562849

CAS#	Parameter	Result	LOQ	Units
74-87-3	Chloromethane	2.00 U	2.00	ug/L
156-59-2	cis-1,2-Dichloroethene	2.00 U	2.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	2.00 U	2.00	ug/L
110-82-7	Cyclohexane	2.00 U	2.00	ug/L
124-48-1	Dibromochloromethane	2.00 U	2.00	ug/L
75-71-8	Dichlorodifluoromethane	2.00 U	2.00	ug/L
100-41-4	Ethylbenzene	2.00 U	2.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	2.00 U	2.00	ug/L
79-20-9	Methyl Acetate	2.00 U	2.00	ug/L
108-87-2	Methylcyclohexane	2.00 U	2.00	ug/L
75-09-2	Methylene chloride	2.00 U	2.00	ug/L
100-42-5	Styrene	2.00 U	2.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	2.00 U	2.00	ug/L
127-18-4	Tetrachloroethene	2.00 U	2.00	ug/L
108-88-3	Toluene	2.00 U	2.00	ug/L
156-60-5	trans-1,2-Dichloroethene	2.00 U	2.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	2.00 U	2.00	ug/L
79-01-6	**Trichloroethene**	**204**	**2.00**	**ug/L**
75-69-4	Trichlorofluoromethane	2.00 U	2.00	ug/L
76-13-1	Trichlorotrifluoroethane	2.00 U	2.00	ug/L
75-01-4	Vinyl chloride	2.00 U	2.00	ug/L
1330-20-7	Xylene (total)	2.00 U	2.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	100	90.6	ug/L	91	78 - 130
1868-53-7	Dibromofluoromethane	100	98.1	ug/L	98	77 - 127
2037-26-5	Toluene d8	100	102	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	100	101	ug/L	101	71 - 127

MW-9

Collect Date	07/08/2015 10:10	**GCAL ID**	21507093717
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	100	07/11/2015 20:02	CJR	562849

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	100 U	100	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	100 U	100	ug/L
79-00-5	1,1,2-Trichloroethane	100 U	100	ug/L
75-34-3	1,1-Dichloroethane	100 U	100	ug/L
75-35-4	**1,1-Dichloroethene**	**216**	**100**	**ug/L**

Sample Results

MW-9	**Collect Date**	07/08/2015 10:10	**GCAL ID**	21507093717
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	100	07/11/2015 20:02	CJR	562849

CAS#	Parameter	Result	LOQ	Units
120-82-1	1,2,4-Trichlorobenzene	100 U	100	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	100 U	100	ug/L
106-93-4	1,2-Dibromoethane	100 U	100	ug/L
95-50-1	1,2-Dichlorobenzene	100 U	100	ug/L
107-06-2	1,2-Dichloroethane	100 U	100	ug/L
78-87-5	1,2-Dichloropropane	100 U	100	ug/L
541-73-1	1,3-Dichlorobenzene	100 U	100	ug/L
106-46-7	1,4-Dichlorobenzene	100 U	100	ug/L
78-93-3	2-Butanone	100 U	100	ug/L
591-78-6	2-Hexanone	100 U	100	ug/L
108-10-1	4-Methyl-2-pentanone	100 U	100	ug/L
67-64-1	Acetone	100 U	100	ug/L
71-43-2	Benzene	100 U	100	ug/L
75-27-4	Bromodichloromethane	100 U	100	ug/L
75-25-2	Bromoform	100 U	100	ug/L
74-83-9	Bromomethane	100 U	100	ug/L
75-15-0	Carbon disulfide	100 U	100	ug/L
56-23-5	Carbon tetrachloride	100 U	100	ug/L
108-90-7	Chlorobenzene	100 U	100	ug/L
75-00-3	Chloroethane	100 U	100	ug/L
67-66-3	Chloroform	100 U	100	ug/L
74-87-3	Chloromethane	100 U	100	ug/L
156-59-2	**cis-1,2-Dichloroethene**	**459**	**100**	**ug/L**
10061-01-5	cis-1,3-Dichloropropene	100 U	100	ug/L
110-82-7	Cyclohexane	100 U	100	ug/L
124-48-1	Dibromochloromethane	100 U	100	ug/L
75-71-8	Dichlorodifluoromethane	100 U	100	ug/L
100-41-4	Ethylbenzene	100 U	100	ug/L
98-82-8	Isopropylbenzene (Cumene)	100 U	100	ug/L
79-20-9	Methyl Acetate	100 U	100	ug/L
108-87-2	Methylcyclohexane	100 U	100	ug/L
75-09-2	Methylene chloride	100 U	100	ug/L
100-42-5	Styrene	100 U	100	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	100 U	100	ug/L
127-18-4	**Tetrachloroethene**	**1000**	**100**	**ug/L**
108-88-3	Toluene	100 U	100	ug/L
156-60-5	trans-1,2-Dichloroethene	100 U	100	ug/L
10061-02-6	trans-1,3-Dichloropropene	100 U	100	ug/L
79-01-6	**Trichloroethene**	**16500**	**100**	**ug/L**
75-69-4	Trichlorofluoromethane	100 U	100	ug/L
76-13-1	Trichlorotrifluoroethane	100 U	100	ug/L
75-01-4	Vinyl chloride	100 U	100	ug/L

Sample Results

MW-9

Collect Date	07/08/2015 10:10	**GCAL ID**	21507093717
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	100	07/11/2015 20:02	CJR	562849

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	100 U	100	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	5000	4560	ug/L	91	78 - 130
1868-53-7	Dibromofluoromethane	5000	4900	ug/L	98	77 - 127
2037-26-5	Toluene d8	5000	5070	ug/L	101	76 - 134
17060-07-0	1,2-Dichloroethane-d4	5000	5120	ug/L	102	71 - 127

EQ-RINSE-1

Collect Date	07/07/2015 18:00	**GCAL ID**	21507093718
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 20:24	CJR	562849

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L

Sample Results

EQ-RINSE-1

Collect Date	07/07/2015 18:00	**GCAL ID**	21507093718
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 20:24	CJR	562849

CAS#	Parameter	Result	LOQ	Units
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	45.8	ug/L	92	78 - 130
1868-53-7	Dibromofluoromethane	50	48.3	ug/L	97	77 - 127
2037-26-5	Toluene d8	50	51.1	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	50.6	ug/L	101	71 - 127

EQ-RINSE-2

Collect Date	07/08/2015 13:30	**GCAL ID**	21507093719
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 20:47	CJR	562849

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L

Sample Results

EQ-RINSE-2

Collect Date	07/08/2015 13:30	**GCAL ID**	21507093719
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 20:47	CJR	562849

CAS#	Parameter	Result	LOQ	Units
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

EQ-RINSE-2

Collect Date 07/08/2015 13:30 **GCAL ID** 21507093719
Receive Date 07/09/2015 10:13 **Matrix** Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 20:47	CJR	562849

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	45.5	ug/L	91	78 - 130
1868-53-7	Dibromofluoromethane	50	48.5	ug/L	97	77 - 127
2037-26-5	Toluene d8	50	50.9	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52	ug/L	104	71 - 127

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Collect Date 07/06/2015 00:00 **GCAL ID** 21507093720
Receive Date 07/09/2015 10:13 **Matrix** Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/09/2015 19:19	BMC2	562665

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L

Sample Results

TRIP BLANK

Collect Date	07/06/2015 00:00	**GCAL ID**	21507093720
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/09/2015 19:19	BMC2	562665

CAS#	Parameter	Result	LOQ	Units
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49.2	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	50	51.2	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	50.1	ug/L	100	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	50.3	ug/L	101	71 - 127

MW-2

Collect Date	07/07/2015 14:20	**GCAL ID**	21507093721
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 21:10	CJR	562849

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L

Sample Results

MW-2	**Collect Date**	07/07/2015 14:20	**GCAL ID**	21507093721
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 21:10	CJR	562849

CAS#	Parameter	Result	LOQ	Units
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	**Trichloroethene**	**27.6**	**1.00**	**ug/L**
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

MW-2

Collect Date	07/07/2015 14:20	GCAL ID	21507093721
Receive Date	07/09/2015 10:13	Matrix	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 21:10	CJR	562849

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	45.9	ug/L	92	78 - 130
1868-53-7	Dibromofluoromethane	50	48.6	ug/L	97	77 - 127
2037-26-5	Toluene d8	50	51	ug/L	102	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	50.6	ug/L	101	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
07/09/2015 16:15	562586	EPA 3010A	1	07/19/2015 18:11	JBW2	563483

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**15.2**	**5.00**	**ug/L**
7440-23-5	**Sodium**	**7500**	**100**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	07/10/2015 13:11	RXJ	562731

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**11.4**	**1.00**	**mg/L**

OW-1

Collect Date	07/08/2015 08:35	GCAL ID	21507093722
Receive Date	07/09/2015 10:13	Matrix	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	07/13/2015 18:56	JCK	562942

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	5.00 U	5.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	5.00 U	5.00	ug/L
79-00-5	1,1,2-Trichloroethane	5.00 U	5.00	ug/L

Sample Results

OW-1	**Collect Date**	07/08/2015 08:35	**GCAL ID**	21507093722
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	07/13/2015 18:56	JCK	562942

CAS#	Parameter	Result	LOQ	Units
75-34-3	**1,1-Dichloroethane**	**6.29**	**5.00**	**ug/L**
75-35-4	1,1-Dichloroethene	5.00 U	5.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	5.00 U	5.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	5.00 U	5.00	ug/L
106-93-4	1,2-Dibromoethane	5.00 U	5.00	ug/L
95-50-1	1,2-Dichlorobenzene	5.00 U	5.00	ug/L
107-06-2	1,2-Dichloroethane	5.00 U	5.00	ug/L
78-87-5	1,2-Dichloropropane	5.00 U	5.00	ug/L
541-73-1	1,3-Dichlorobenzene	5.00 U	5.00	ug/L
106-46-7	1,4-Dichlorobenzene	5.00 U	5.00	ug/L
78-93-3	2-Butanone	5.00 U	5.00	ug/L
591-78-6	2-Hexanone	5.00 U	5.00	ug/L
108-10-1	4-Methyl-2-pentanone	5.00 U	5.00	ug/L
67-64-1	Acetone	5.00 U	5.00	ug/L
71-43-2	Benzene	5.00 U	5.00	ug/L
75-27-4	Bromodichloromethane	5.00 U	5.00	ug/L
75-25-2	Bromoform	5.00 U	5.00	ug/L
74-83-9	Bromomethane	5.00 U	5.00	ug/L
75-15-0	Carbon disulfide	5.00 U	5.00	ug/L
56-23-5	Carbon tetrachloride	5.00 U	5.00	ug/L
108-90-7	Chlorobenzene	5.00 U	5.00	ug/L
75-00-3	Chloroethane	5.00 U	5.00	ug/L
67-66-3	Chloroform	5.00 U	5.00	ug/L
74-87-3	Chloromethane	5.00 U	5.00	ug/L
156-59-2	cis-1,2-Dichloroethene	5.00 U	5.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	5.00 U	5.00	ug/L
110-82-7	Cyclohexane	5.00 U	5.00	ug/L
124-48-1	Dibromochloromethane	5.00 U	5.00	ug/L
75-71-8	Dichlorodifluoromethane	5.00 U	5.00	ug/L
100-41-4	Ethylbenzene	5.00 U	5.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	5.00 U	5.00	ug/L
79-20-9	**Methyl Acetate**	**10.8**	**5.00**	**ug/L**
108-87-2	Methylcyclohexane	5.00 U	5.00	ug/L
75-09-2	Methylene chloride	5.00 U	5.00	ug/L
100-42-5	Styrene	5.00 U	5.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	5.00 U	5.00	ug/L
127-18-4	**Tetrachloroethene**	**12.7**	**5.00**	**ug/L**
108-88-3	Toluene	5.00 U	5.00	ug/L
156-60-5	trans-1,2-Dichloroethene	5.00 U	5.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	5.00 U	5.00	ug/L
79-01-6	**Trichloroethene**	**514**	**5.00**	**ug/L**
75-69-4	Trichlorofluoromethane	5.00 U	5.00	ug/L
76-13-1	Trichlorotrifluoroethane	5.00 U	5.00	ug/L
75-01-4	Vinyl chloride	5.00 U	5.00	ug/L

Sample Results

OW-1

Collect Date	07/08/2015 08:35	GCAL ID	21507093722
Receive Date	07/09/2015 10:13	Matrix	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	5	07/13/2015 18:56	JCK	562942

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	5.00 U	5.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	250	254	ug/L	102	78 - 130
1868-53-7	Dibromofluoromethane	250	258	ug/L	103	77 - 127
2037-26-5	Toluene d8	250	247	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	250	258	ug/L	103	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
07/09/2015 16:15	562586	EPA 3010A	100	07/19/2015 18:19	JBW2	563483

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**1100**	**500**	**ug/L**
7440-23-5	**Sodium**	**11000**	**10000**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	10	07/10/2015 13:28	RXJ	562731

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**6.76**	**2.00**	**mg/L**

MW-3

Collect Date	07/08/2015 11:10	GCAL ID	21507093723
Receive Date	07/09/2015 10:13	Matrix	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/13/2015 16:04	JCK	562942

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	**1,1,2-Trichloroethane**	**1.08**	**1.00**	**ug/L**

Sample Results

MW-3	**Collect Date**	07/08/2015 11:10	**GCAL ID**	21507093723
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/13/2015 16:04	JCK	562942

CAS#	Parameter	Result	LOQ	Units
75-34-3	**1,1-Dichloroethane**	**5.79**	**1.00**	**ug/L**
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	**Acetone**	**15.2**	**1.00**	**ug/L**
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	**Chloroform**	**1.16**	**1.00**	**ug/L**
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	**Methyl Acetate**	**9.53**	**1.00**	**ug/L**
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	**Trichloroethene**	**13.9**	**1.00**	**ug/L**
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

MW-3

Collect Date	07/08/2015 11:10	**GCAL ID**	21507093723
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/13/2015 16:04	JCK	562942

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	48.6	ug/L	97	78 - 130
1868-53-7	Dibromofluoromethane	50	50.9	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	49.4	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	51.5	ug/L	103	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
07/09/2015 16:15	562586	EPA 3010A	100	07/20/2015 16:29	TAH	563552

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**19300**	**500**	**ug/L**
7440-23-5	**Sodium**	**26900**	**10000**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	10	07/10/2015 13:46	RXJ	562731

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**7.08**	**2.00**	**mg/L**

IW-2B

Collect Date	07/08/2015 11:35	**GCAL ID**	21507093724
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/13/2015 16:25	JCK	562942

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L

Sample Results

IW-2B

Collect Date	07/08/2015 11:35	**GCAL ID**	21507093724
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/13/2015 16:25	JCK	562942

CAS#	Parameter	Result	LOQ	Units
75-34-3	1,1-Dichloroethane	1.00 U	1.00	ug/L
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	**Acetone**	**8.44**	**1.00**	**ug/L**
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	**Chloroform**	**1.33**	**1.00**	**ug/L**
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	**Methyl Acetate**	**4.46**	**1.00**	**ug/L**
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

IW-2B

Collect Date	07/08/2015 11:35	**GCAL ID**	21507093724
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/13/2015 16:25	JCK	562942

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49	ug/L	98	78 - 130
1868-53-7	Dibromofluoromethane	50	51.2	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	49.3	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	51.2	ug/L	102	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
07/09/2015 16:15	562586	EPA 3010A	100	07/19/2015 19:08	JBW2	563483

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**39000**	**500**	**ug/L**
7440-23-5	**Sodium**	**770000**	**10000**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	50	07/10/2015 21:01	RXJ	562731

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**28.9**	**10.0**	**mg/L**

IW-2A

Collect Date	07/08/2015 11:55	**GCAL ID**	21507093725
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 22:43	CJR	562849

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L

Sample Results

IW-2A	**Collect Date**	07/08/2015 11:55	**GCAL ID**	21507093725
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 22:43	CJR	562849

CAS#	Parameter	Result	LOQ	Units
75-34-3	**1,1-Dichloroethane**	**1.00**	**1.00**	**ug/L**
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	Methyl Acetate	1.00 U	1.00	ug/L
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

IW-2A

Collect Date	07/08/2015 11:55	**GCAL ID**	21507093725
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 22:43	CJR	562849

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	44.4	ug/L	89	78 - 130
1868-53-7	Dibromofluoromethane	50	49	ug/L	98	77 - 127
2037-26-5	Toluene d8	50	52.1	ug/L	104	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	52	ug/L	104	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
07/09/2015 16:15	562586	EPA 3010A	100	07/19/2015 19:12	JBW2	563483

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**2840**	**500**	**ug/L**
7440-23-5	**Sodium**	**862000**	**10000**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	20	07/10/2015 21:53	RXJ	562731

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**17.9**	**4.00**	**mg/L**

IW-1B

Collect Date	07/08/2015 12:20	**GCAL ID**	21507093726
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 23:06	CJR	562849

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L

Sample Results

IW-1B

Collect Date	07/08/2015 12:20	**GCAL ID**	21507093726
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 23:06	CJR	562849

CAS#	Parameter	Result	LOQ	Units
75-34-3	**1,1-Dichloroethane**	**1.19**	**1.00**	**ug/L**
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	**Chloroform**	**1.03**	**1.00**	**ug/L**
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	**Methyl Acetate**	**4.54**	**1.00**	**ug/L**
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

IW-1B

Collect Date	07/08/2015 12:20	**GCAL ID**	21507093726
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/11/2015 23:06	CJR	562849

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	45.2	ug/L	90	78 - 130
1868-53-7	Dibromofluoromethane	50	48.2	ug/L	96	77 - 127
2037-26-5	Toluene d8	50	50.6	ug/L	101	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	51.3	ug/L	103	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
07/09/2015 16:15	562586	EPA 3010A	100	07/19/2015 19:21	JBW2	563483

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**13000**	**500**	**ug/L**
7440-23-5	**Sodium**	**624000**	**10000**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	50	07/11/2015 12:09	RXJ	562731

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**17.4**	**10.0**	**mg/L**

IW-1A

Collect Date	07/08/2015 12:55	**GCAL ID**	21507093727
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/13/2015 16:46	JCK	562942

CAS#	Parameter	Result	LOQ	Units
71-55-6	1,1,1-Trichloroethane	1.00 U	1.00	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.00 U	1.00	ug/L
79-00-5	1,1,2-Trichloroethane	1.00 U	1.00	ug/L

Sample Results

IW-1A

Collect Date	07/08/2015 12:55	**GCAL ID**	21507093727
Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/13/2015 16:46	JCK	562942

CAS#	Parameter	Result	LOQ	Units
75-34-3	**1,1-Dichloroethane**	**1.44**	**1.00**	**ug/L**
75-35-4	1,1-Dichloroethene	1.00 U	1.00	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.00 U	1.00	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	1.00 U	1.00	ug/L
106-93-4	1,2-Dibromoethane	1.00 U	1.00	ug/L
95-50-1	1,2-Dichlorobenzene	1.00 U	1.00	ug/L
107-06-2	1,2-Dichloroethane	1.00 U	1.00	ug/L
78-87-5	1,2-Dichloropropane	1.00 U	1.00	ug/L
541-73-1	1,3-Dichlorobenzene	1.00 U	1.00	ug/L
106-46-7	1,4-Dichlorobenzene	1.00 U	1.00	ug/L
78-93-3	2-Butanone	1.00 U	1.00	ug/L
591-78-6	2-Hexanone	1.00 U	1.00	ug/L
108-10-1	4-Methyl-2-pentanone	1.00 U	1.00	ug/L
67-64-1	Acetone	1.00 U	1.00	ug/L
71-43-2	Benzene	1.00 U	1.00	ug/L
75-27-4	Bromodichloromethane	1.00 U	1.00	ug/L
75-25-2	Bromoform	1.00 U	1.00	ug/L
74-83-9	Bromomethane	1.00 U	1.00	ug/L
75-15-0	Carbon disulfide	1.00 U	1.00	ug/L
56-23-5	Carbon tetrachloride	1.00 U	1.00	ug/L
108-90-7	Chlorobenzene	1.00 U	1.00	ug/L
75-00-3	Chloroethane	1.00 U	1.00	ug/L
67-66-3	Chloroform	1.00 U	1.00	ug/L
74-87-3	Chloromethane	1.00 U	1.00	ug/L
156-59-2	cis-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.00 U	1.00	ug/L
110-82-7	Cyclohexane	1.00 U	1.00	ug/L
124-48-1	Dibromochloromethane	1.00 U	1.00	ug/L
75-71-8	Dichlorodifluoromethane	1.00 U	1.00	ug/L
100-41-4	Ethylbenzene	1.00 U	1.00	ug/L
98-82-8	Isopropylbenzene (Cumene)	1.00 U	1.00	ug/L
79-20-9	**Methyl Acetate**	**10.8**	**1.00**	**ug/L**
108-87-2	Methylcyclohexane	1.00 U	1.00	ug/L
75-09-2	Methylene chloride	1.00 U	1.00	ug/L
100-42-5	Styrene	1.00 U	1.00	ug/L
1634-04-4	tert-Butyl methyl ether (MTBE)	1.00 U	1.00	ug/L
127-18-4	Tetrachloroethene	1.00 U	1.00	ug/L
108-88-3	Toluene	1.00 U	1.00	ug/L
156-60-5	trans-1,2-Dichloroethene	1.00 U	1.00	ug/L
10061-02-6	trans-1,3-Dichloropropene	1.00 U	1.00	ug/L
79-01-6	Trichloroethene	1.00 U	1.00	ug/L
75-69-4	Trichlorofluoromethane	1.00 U	1.00	ug/L
76-13-1	Trichlorotrifluoroethane	1.00 U	1.00	ug/L
75-01-4	Vinyl chloride	1.00 U	1.00	ug/L

Sample Results

IW-1A	**Collect Date**	07/08/2015 12:55	**GCAL ID**	21507093727
	Receive Date	07/09/2015 10:13	**Matrix**	Water

EPA 8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	07/13/2015 16:46	JCK	562942

CAS#	Parameter	Result	LOQ	Units
1330-20-7	Xylene (total)	1.00 U	1.00	ug/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	50	49.3	ug/L	99	78 - 130
1868-53-7	Dibromofluoromethane	50	51.1	ug/L	102	77 - 127
2037-26-5	Toluene d8	50	49.7	ug/L	99	76 - 134
17060-07-0	1,2-Dichloroethane-d4	50	50.9	ug/L	102	71 - 127

EPA 6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
07/09/2015 16:15	562586	EPA 3010A	100	07/19/2015 19:25	JBW2	563483

CAS#	Parameter	Result	LOQ	Units
7439-96-5	**Manganese**	**12100**	**500**	**ug/L**
7440-23-5	**Sodium**	**262000**	**10000**	**ug/L**

EPA 300.0, Rev 2.1

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	20	07/11/2015 12:26	RXJ	562731

CAS#	Parameter	Result	LOQ	Units
16887-00-6	**Chloride**	**13.0**	**4.00**	**mg/L**

GC/MS Volatiles QC Summary

Analytical Batch 562665	Client ID	MB562665		LCS562665				LCSD562665				
	GCAL ID	1464686		1464687				1464688				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	07/09/2015 18:58		07/09/2015 17:34				07/09/2015 17:55				
	Matrix	Water		Water				Water				
EPA 8260B		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,1,1-Trichloroethane	71-55-6	1.00U	1.00	50.0	50.9	102	76 - 126	50.0	47.0	94	8	30
1,1,2,2-Tetrachloroethane	79-34-5	1.00U	1.00	50.0	48.6	97	70 - 122	50.0	46.0	92	5	30
1,1,2-Trichloroethane	79-00-5	1.00U	1.00	50.0	49.8	100	72 - 121	50.0	48.7	97	2	30
1,1-Dichloroethane	75-34-3	1.00U	1.00	50.0	49.7	99	74 - 127	50.0	47.2	94	5	30
1,1-Dichloroethene	75-35-4	1.00U	1.00	50.0	51.1	102	69 - 129	50.0	46.1	92	10	20
1,2,4-Trichlorobenzene	120-82-1	1.00U	1.00	50.0	50.7	101	61 - 135	50.0	48.7	97	4	30
1,2-Dibromo-3-chloropropane	96-12-8	1.00U	1.00	50.0	47.9	96	57 - 121	50.0	48.6	97	1	30
1,2-Dibromoethane	106-93-4	1.00U	1.00	50.0	50.7	101	70 - 124	50.0	49.6	99	2	30
1,2-Dichlorobenzene	95-50-1	1.00U	1.00	50.0	49.5	99	71 - 126	50.0	47.4	95	4	30
1,2-Dichloroethane	107-06-2	1.00U	1.00	50.0	48.5	97	71 - 129	50.0	46.2	92	5	30
1,2-Dichloropropane	78-87-5	1.00U	1.00	50.0	50.9	102	72 - 128	50.0	48.7	97	4	30
1,3-Dichlorobenzene	541-73-1	1.00U	1.00	50.0	49.7	99	74 - 126	50.0	46.7	93	6	30
1,4-Dichlorobenzene	106-46-7	1.00U	1.00	50.0	48.5	97	72 - 122	50.0	45.6	91	6	30
2-Butanone	78-93-3	1.00U	1.00	50.0	49.5	99	58 - 137	50.0	48.9	98	1	30
2-Hexanone	591-78-6	1.00U	1.00	50.0	44.7	89	50 - 135	50.0	44.6	89	0	30
4-Methyl-2-pentanone	108-10-1	1.00U	1.00	50.0	45.9	92	57 - 132	50.0	46.0	92	0	30
Acetone	67-64-1	1.00U	1.00	50.0	42.2	84	44 - 156	50.0	42.0	84	1	30
Benzene	71-43-2	1.00U	1.00	50.0	50.3	101	70 - 129	50.0	47.2	94	6	20
Bromodichloromethane	75-27-4	1.00U	1.00	50.0	49.6	99	74 - 125	50.0	48.0	96	3	30
Bromoform	75-25-2	1.00U	1.00	50.0	50.9	102	64 - 122	50.0	49.8	100	2	30
Bromomethane	74-83-9	1.00U	1.00	50.0	51.0	102	47 - 138	50.0	48.1	96	6	30
Carbon disulfide	75-15-0	1.00U	1.00	50.0	51.3	103	69 - 136	50.0	46.9	94	9	30
Carbon tetrachloride	56-23-5	1.00U	1.00	50.0	51.9	104	76 - 128	50.0	46.7	93	11	30
Chlorobenzene	108-90-7	1.00U	1.00	50.0	50.5	101	74 - 123	50.0	47.7	95	6	20
Chloroethane	75-00-3	1.00U	1.00	50.0	56.1	112	62 - 141	50.0	49.7	99	12	30
Chloroform	67-66-3	1.00U	1.00	50.0	49.7	99	75 - 122	50.0	46.2	92	7	30
Chloromethane	74-87-3	1.00U	1.00	50.0	51.3	103	59 - 132	50.0	47.7	95	7	30
cis-1,2-Dichloroethene	156-59-2	1.00U	1.00	50.0	50.3	101	73 - 130	50.0	46.6	93	8	30
cis-1,3-Dichloropropene	10061-01-5	1.00U	1.00	50.0	52.4	105	71 - 132	50.0	50.2	100	4	30
Cyclohexane	110-82-7	1.00U	1.00	50.0	53.8	108	69 - 132	50.0	48.0	96	11	30
Dibromochloromethane	124-48-1	1.00U	1.00	50.0	51.0	102	71 - 123	50.0	49.2	98	4	30
Dichlorodifluoromethane	75-71-8	1.00U	1.00	50.0	51.4	103	58 - 140	50.0	45.8	92	12	30
Ethylbenzene	100-41-4	1.00U	1.00	50.0	51.5	103	74 - 126	50.0	47.9	96	7	30
Isopropylbenzene (Cumene)	98-82-8	1.00U	1.00	50.0	53.5	107	71 - 125	50.0	49.6	99	8	30
Methyl Acetate	79-20-9	1.00U	1.00	50.0	47.7	95	57 - 139	50.0	45.5	91	5	30
Methylcyclohexane	108-87-2	1.00U	1.00	50.0	52.2	104	67 - 138	50.0	46.9	94	11	30
Methylene chloride	75-09-2	1.99	1.00	50.0	48.9	98	68 - 132	50.0	47.1	94	4	30
Styrene	100-42-5	1.00U	1.00	50.0	53.6	107	71 - 127	50.0	50.5	101	6	30
tert-Butyl methyl ether (MTBE)	1634-04-4	1.00U	1.00	50.0	50.6	101	71 - 125	50.0	49.1	98	3	30
Tetrachloroethene	127-18-4	1.00U	1.00	50.0	50.9	102	68 - 128	50.0	46.7	93	9	30
Toluene	108-88-3	1.00U	1.00	50.0	49.4	99	72 - 120	50.0	46.7	93	6	20
trans-1,2-Dichloroethene	156-60-5	1.00U	1.00	50.0	49.4	99	69 - 132	50.0	45.0	90	9	30
trans-1,3-Dichloropropene	10061-02-6	1.00U	1.00	50.0	53.1	106	71 - 131	50.0	51.0	102	4	30
Trichloroethene	79-01-6	1.00U	1.00	50.0	48.9	98	76 - 129	50.0	46.0	92	6	20
Trichlorofluoromethane	75-69-4	1.00U	1.00	50.0	52.0	104	72 - 136	50.0	46.9	94	10	30
Trichlorotrifluoroethane	76-13-1	1.00U	1.00	50.0	53.8	108	72 - 136	50.0	48.2	96	11	30
Vinyl chloride	75-01-4	1.00U	1.00	50.0	51.2	102	68 - 132	50.0	46.1	92	10	30
Xylene (total)	1330-20-7	1.00U	1.00	150	159	106	74 - 127	150	150	100	6	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	50.6	101	50	50.1	100	71 - 127	50	49.2	98	2	NA
4-Bromofluorobenzene	460-00-4	49.3	99	50	50.9	102	78 - 130	50	51.1	102	0	NA
Dibromofluoromethane	1868-53-7	51.5	103	50	51.1	102	77 - 127	50	50.4	101	1	NA
Toluene d8	2037-26-5	50	100	50	50.4	101	76 - 134	50	50.4	101	0	NA

GC/MS Volatiles QC Summary

Analytical Batch 562754	Client ID	MB562754		LCS562754				LCSD562754				
	GCAL ID	1465094		1465095				1465096				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	07/10/2015 15:22		07/10/2015 13:58				07/10/2015 14:19				
	Matrix	Water		Water				Water				
EPA 8260B		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,1,1-Trichloroethane	71-55-6	1.00U	1.00	50.0	55.6	111	76 - 126	50.0	55.1	110	1	30
1,1,2,2-Tetrachloroethane	79-34-5	1.00U	1.00	50.0	49.0	98	70 - 122	50.0	50.2	100	2	30
1,1,2-Trichloroethane	79-00-5	1.00U	1.00	50.0	52.9	106	72 - 121	50.0	54.0	108	2	30
1,1-Dichloroethane	75-34-3	1.00U	1.00	50.0	54.4	109	74 - 127	50.0	53.4	107	2	30
1,1-Dichloroethene	75-35-4	1.00U	1.00	50.0	54.3	109	69 - 129	50.0	57.9	116	6	20
1,2,4-Trichlorobenzene	120-82-1	1.00U	1.00	50.0	54.5	109	61 - 135	50.0	56.3	113	3	30
1,2-Dibromo-3-chloropropane	96-12-8	1.00U	1.00	50.0	47.5	95	57 - 121	50.0	49.7	99	5	30
1,2-Dibromoethane	106-93-4	1.00U	1.00	50.0	53.0	106	70 - 124	50.0	53.6	107	1	30
1,2-Dichlorobenzene	95-50-1	1.00U	1.00	50.0	51.3	103	71 - 126	50.0	53.6	107	4	30
1,2-Dichloroethane	107-06-2	1.00U	1.00	50.0	53.7	107	71 - 129	50.0	52.6	105	2	30
1,2-Dichloropropane	78-87-5	1.00U	1.00	50.0	54.3	109	72 - 128	50.0	54.6	109	1	30
1,3-Dichlorobenzene	541-73-1	1.00U	1.00	50.0	51.8	104	74 - 126	50.0	52.9	106	2	30
1,4-Dichlorobenzene	106-46-7	1.00U	1.00	50.0	51.0	102	72 - 122	50.0	51.9	104	2	30
2-Butanone	78-93-3	1.00U	1.00	50.0	49.5	99	58 - 137	50.0	48.1	96	3	30
2-Hexanone	591-78-6	1.00U	1.00	50.0	43.6	87	50 - 135	50.0	44.7	89	2	30
4-Methyl-2-pentanone	108-10-1	1.00U	1.00	50.0	45.6	91	57 - 132	50.0	46.3	93	2	30
Acetone	67-64-1	1.00U	1.00	50.0	50.4	101	44 - 156	50.0	47.9	96	5	30
Benzene	71-43-2	1.00U	1.00	50.0	53.6	107	70 - 129	50.0	52.6	105	2	20
Bromodichloromethane	75-27-4	1.00U	1.00	50.0	54.9	110	74 - 125	50.0	54.1	108	1	30
Bromoform	75-25-2	1.00U	1.00	50.0	54.6	109	64 - 122	50.0	56.1	112	3	30
Bromomethane	74-83-9	1.00U	1.00	50.0	57.7	115	47 - 138	50.0	58.8	118	2	30
Carbon disulfide	75-15-0	1.00U	1.00	50.0	55.9	112	69 - 136	50.0	56.3	113	1	30
Carbon tetrachloride	56-23-5	1.00U	1.00	50.0	58.3	117	76 - 128	50.0	57.9	116	1	30
Chlorobenzene	108-90-7	1.00U	1.00	50.0	53.0	106	74 - 123	50.0	53.6	107	1	20
Chloroethane	75-00-3	1.00U	1.00	50.0	61.9	124	62 - 141	50.0	64.4	129	4	30
Chloroform	67-66-3	1.00U	1.00	50.0	55.3	111	75 - 122	50.0	54.0	108	2	30
Chloromethane	74-87-3	1.00U	1.00	50.0	53.7	107	59 - 132	50.0	52.8	106	2	30
cis-1,2-Dichloroethene	156-59-2	1.00U	1.00	50.0	54.1	108	73 - 130	50.0	54.0	108	0	30
cis-1,3-Dichloropropene	10061-01-5	1.00U	1.00	50.0	57.7	115	71 - 132	50.0	56.5	113	2	30
Cyclohexane	110-82-7	1.00U	1.00	50.0	60.1	120	69 - 132	50.0	58.6	117	3	30
Dibromochloromethane	124-48-1	1.00U	1.00	50.0	55.0	110	71 - 123	50.0	55.4	111	1	30
Dichlorodifluoromethane	75-71-8	1.00U	1.00	50.0	60.2	120	58 - 140	50.0	58.1	116	4	30
Ethylbenzene	100-41-4	1.00U	1.00	50.0	54.7	109	74 - 126	50.0	54.2	108	1	30
Isopropylbenzene (Cumene)	98-82-8	1.00U	1.00	50.0	57.1	114	71 - 125	50.0	57.1	114	0	30
Methyl Acetate	79-20-9	1.00U	1.00	50.0	50.8	102	57 - 139	50.0	48.8	98	4	30
Methylcyclohexane	108-87-2	1.00U	1.00	50.0	59.6	119	67 - 138	50.0	57.1	114	4	30
Methylene chloride	75-09-2	1.00U	1.00	50.0	53.2	106	68 - 132	50.0	50.3	101	6	30
Styrene	100-42-5	1.00U	1.00	50.0	56.9	114	71 - 127	50.0	56.8	114	0	30
tert-Butyl methyl ether (MTBE)	1634-04-4	1.00U	1.00	50.0	53.8	108	71 - 125	50.0	52.7	105	2	30
Tetrachloroethene	127-18-4	1.00U	1.00	50.0	56.5	113	68 - 128	50.0	56.1	112	1	30
Toluene	108-88-3	1.00U	1.00	50.0	52.5	105	72 - 120	50.0	52.8	106	1	20
trans-1,2-Dichloroethene	156-60-5	1.00U	1.00	50.0	54.3	109	69 - 132	50.0	51.5	103	5	30
trans-1,3-Dichloropropene	10061-02-6	1.00U	1.00	50.0	58.0	116	71 - 131	50.0	57.8	116	0	30
Trichloroethene	79-01-6	1.00U	1.00	50.0	52.7	105	76 - 129	50.0	52.5	105	0	20
Trichlorofluoromethane	75-69-4	1.00U	1.00	50.0	60.7	121	72 - 136	50.0	61.1	122	1	30
Trichlorotrifluoroethane	76-13-1	1.00U	1.00	50.0	62.6	125	72 - 136	50.0	63.7	127	2	30
Vinyl chloride	75-01-4	1.00U	1.00	50.0	56.8	114	68 - 132	50.0	56.1	112	1	30
Xylene (total)	1330-20-7	1.00U	1.00	150	168	112	74 - 127	150	168	112	0	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	51.4	103	50	52.3	105	71 - 127	50	51.6	103	1	NA
4-Bromofluorobenzene	460-00-4	51.6	103	50	53.1	106	78 - 130	50	52.8	106	1	NA
Dibromofluoromethane	1868-53-7	50.9	102	50	51.9	104	77 - 127	50	51.7	103	0	NA
Toluene d8	2037-26-5	49.7	99	50	50	100	76 - 134	50	49.8	100	0	NA

GC/MS Volatiles QC Summary

Analytical Batch 562849	Client ID	MB562849		LCS562849				LCSD562849				
	GCAL ID	1465493		1465494				1465495				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	07/11/2015 15:43		07/11/2015 13:16				07/11/2015 14:15				
	Matrix	Water		Water				Water				
EPA 8260B		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,1,1-Trichloroethane	71-55-6	1.00U	1.00	50.0	53.7	107	76 - 126	50.0	54.7	109	2	30
1,1,2,2-Tetrachloroethane	79-34-5	1.00U	1.00	50.0	58.7	117	70 - 122	50.0	57.2	114	3	30
1,1,2-Trichloroethane	79-00-5	1.00U	1.00	50.0	56.5	113	72 - 121	50.0	55.8	112	1	30
1,1-Dichloroethane	75-34-3	1.00U	1.00	50.0	56.4	113	74 - 127	50.0	60.3	121	7	30
1,1-Dichloroethene	75-35-4	1.00U	1.00	50.0	50.7	101	69 - 129	50.0	51.3	103	1	20
1,2,4-Trichlorobenzene	120-82-1	1.00U	1.00	50.0	59.2	118	61 - 135	50.0	60.3	121	2	30
1,2-Dibromo-3-chloropropane	96-12-8	1.00U	1.00	50.0	63.8	**128***	57 - 121	50.0	59.8	120	6	30
1,2-Dibromoethane	106-93-4	1.00U	1.00	50.0	58.2	116	70 - 124	50.0	56.9	114	2	30
1,2-Dichlorobenzene	95-50-1	1.00U	1.00	50.0	56.8	114	71 - 126	50.0	56.7	113	0	30
1,2-Dichloroethane	107-06-2	1.00U	1.00	50.0	52.6	105	71 - 129	50.0	51.9	104	1	30
1,2-Dichloropropane	78-87-5	1.00U	1.00	50.0	59.4	119	72 - 128	50.0	59.0	118	1	30
1,3-Dichlorobenzene	541-73-1	1.00U	1.00	50.0	56.7	113	74 - 126	50.0	57.7	115	2	30
1,4-Dichlorobenzene	106-46-7	1.00U	1.00	50.0	55.8	112	72 - 122	50.0	56.4	113	1	30
2-Butanone	78-93-3	1.00U	1.00	50.0	61.5	123	58 - 137	50.0	56.3	113	9	30
2-Hexanone	591-78-6	1.00U	1.00	50.0	63.6	127	50 - 135	50.0	59.5	119	7	30
4-Methyl-2-pentanone	108-10-1	1.00U	1.00	50.0	61.8	124	57 - 132	50.0	57.3	115	8	30
Acetone	67-64-1	1.00U	1.00	50.0	56.0	112	44 - 156	50.0	52.1	104	7	30
Benzene	71-43-2	1.00U	1.00	50.0	55.1	110	70 - 129	50.0	55.1	110	0	20
Bromodichloromethane	75-27-4	1.00U	1.00	50.0	56.9	114	74 - 125	50.0	56.6	113	1	30
Bromoform	75-25-2	1.00U	1.00	50.0	59.2	118	64 - 122	50.0	58.3	117	2	30
Bromomethane	74-83-9	1.00U	1.00	50.0	43.1	86	47 - 138	50.0	45.5	91	5	30
Carbon disulfide	75-15-0	1.00U	1.00	50.0	56.2	112	69 - 136	50.0	59.6	119	6	30
Carbon tetrachloride	56-23-5	1.00U	1.00	50.0	59.2	118	76 - 128	50.0	59.4	119	0	30
Chlorobenzene	108-90-7	1.00U	1.00	50.0	54.6	109	74 - 123	50.0	54.9	110	1	20
Chloroethane	75-00-3	1.00U	1.00	50.0	50.6	101	62 - 141	50.0	49.0	98	3	30
Chloroform	67-66-3	1.00U	1.00	50.0	54.4	109	75 - 122	50.0	54.5	109	0	30
Chloromethane	74-87-3	1.00U	1.00	50.0	43.7	87	59 - 132	50.0	43.2	86	1	30
cis-1,2-Dichloroethene	156-59-2	1.00U	1.00	50.0	57.1	114	73 - 130	50.0	57.1	114	0	30
cis-1,3-Dichloropropene	10061-01-5	1.00U	1.00	50.0	58.0	116	71 - 132	50.0	57.9	116	0	30
Cyclohexane	110-82-7	1.00U	1.00	50.0	60.2	120	69 - 132	50.0	61.1	122	1	30
Dibromochloromethane	124-48-1	1.00U	1.00	50.0	60.3	121	71 - 123	50.0	59.8	120	1	30
Dichlorodifluoromethane	75-71-8	1.00U	1.00	50.0	34.1	68	58 - 140	50.0	35.4	71	4	30
Ethylbenzene	100-41-4	1.00U	1.00	50.0	55.4	111	74 - 126	50.0	56.2	112	1	30
Isopropylbenzene (Cumene)	98-82-8	1.00U	1.00	50.0	57.4	115	71 - 125	50.0	59.0	118	3	30
Methyl Acetate	79-20-9	1.00U	1.00	50.0	58.0	116	57 - 139	50.0	56.7	113	2	30
Methylcyclohexane	108-87-2	1.00U	1.00	50.0	58.4	117	67 - 138	50.0	61.4	123	5	30
Methylene chloride	75-09-2	1.00U	1.00	50.0	53.6	107	68 - 132	50.0	53.5	107	0	30
Styrene	100-42-5	1.00U	1.00	50.0	56.3	113	71 - 127	50.0	56.6	113	1	30
tert-Butyl methyl ether (MTBE)	1634-04-4	1.00U	1.00	50.0	51.0	102	71 - 125	50.0	49.9	100	2	30
Tetrachloroethene	127-18-4	1.00U	1.00	50.0	52.4	105	68 - 128	50.0	55.2	110	5	30
Toluene	108-88-3	1.00U	1.00	50.0	55.4	111	72 - 120	50.0	55.9	112	1	20
trans-1,2-Dichloroethene	156-60-5	1.00U	1.00	50.0	53.3	107	69 - 132	50.0	54.4	109	2	30
trans-1,3-Dichloropropene	10061-02-6	1.00U	1.00	50.0	59.9	120	71 - 131	50.0	60.1	120	0	30
Trichloroethene	79-01-6	1.00U	1.00	50.0	52.5	105	76 - 129	50.0	52.9	106	1	20
Trichlorofluoromethane	75-69-4	1.00U	1.00	50.0	52.5	105	72 - 136	50.0	53.7	107	2	30
Trichlorotrifluoroethane	76-13-1	1.00U	1.00	50.0	53.9	108	72 - 136	50.0	56.6	113	5	30
Vinyl chloride	75-01-4	1.00U	1.00	50.0	51.2	102	68 - 132	50.0	53.3	107	4	30
Xylene (total)	1330-20-7	1.00U	1.00	150	170	113	74 - 127	150	173	115	2	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	51.2	102	50	51.7	103	71 - 127	50	51.6	103	0	NA
4-Bromofluorobenzene	460-00-4	46.3	93	50	47.7	95	78 - 130	50	48.1	96	1	NA
Dibromofluoromethane	1868-53-7	49	98	50	50.7	101	77 - 127	50	50.2	100	1	NA
Toluene d8	2037-26-5	51.2	102	50	49.8	100	76 - 134	50	49.6	99	0	NA

GC/MS Volatiles QC Summary

Analytical Batch 562942	Client ID	MB562942		LCS562942				LCSD562942				
	GCAL ID	1465856		1465857				1465858				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	07/13/2015 10:49		07/13/2015 09:22				07/13/2015 09:46				
	Matrix	Water		Water				Water				
EPA 8260B		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,1,1-Trichloroethane	71-55-6	1.00U	1.00	50.0	51.6	103	76 - 126	50.0	52.8	106	2	30
1,1,2,2-Tetrachloroethane	79-34-5	1.00U	1.00	50.0	45.2	90	70 - 122	50.0	47.1	94	4	30
1,1,2-Trichloroethane	79-00-5	1.00U	1.00	50.0	51.5	103	72 - 121	50.0	53.3	107	3	30
1,1-Dichloroethane	75-34-3	1.00U	1.00	50.0	51.7	103	74 - 127	50.0	51.5	103	0	30
1,1-Dichloroethene	75-35-4	1.00U	1.00	50.0	53.6	107	69 - 129	50.0	54.1	108	1	20
1,2,4-Trichlorobenzene	120-82-1	1.00U	1.00	50.0	53.3	107	61 - 135	50.0	51.9	104	3	30
1,2-Dibromo-3-chloropropane	96-12-8	1.00U	1.00	50.0	43.4	87	57 - 121	50.0	43.7	87	1	30
1,2-Dibromoethane	106-93-4	1.00U	1.00	50.0	50.8	102	70 - 124	50.0	52.1	104	3	30
1,2-Dichlorobenzene	95-50-1	1.00U	1.00	50.0	51.5	103	71 - 126	50.0	51.1	102	1	30
1,2-Dichloroethane	107-06-2	1.00U	1.00	50.0	51.8	104	71 - 129	50.0	50.8	102	2	30
1,2-Dichloropropane	78-87-5	1.00U	1.00	50.0	53.1	106	72 - 128	50.0	52.8	106	1	30
1,3-Dichlorobenzene	541-73-1	1.00U	1.00	50.0	51.7	103	74 - 126	50.0	50.7	101	2	30
1,4-Dichlorobenzene	106-46-7	1.00U	1.00	50.0	50.7	101	72 - 122	50.0	48.9	98	4	30
2-Butanone	78-93-3	1.00U	1.00	50.0	40.6	81	58 - 137	50.0	41.8	84	3	30
2-Hexanone	591-78-6	1.00U	1.00	50.0	38.3	77	50 - 135	50.0	40.4	81	5	30
4-Methyl-2-pentanone	108-10-1	1.00U	1.00	50.0	39.6	79	57 - 132	50.0	41.7	83	5	30
Acetone	67-64-1	1.00U	1.00	50.0	45.2	90	44 - 156	50.0	44.6	89	1	30
Benzene	71-43-2	1.00U	1.00	50.0	50.9	102	70 - 129	50.0	51.1	102	0	20
Bromodichloromethane	75-27-4	1.00U	1.00	50.0	54.5	109	74 - 125	50.0	54.3	109	0	30
Bromoform	75-25-2	1.00U	1.00	50.0	54.1	108	64 - 122	50.0	55.5	111	3	30
Bromomethane	74-83-9	1.00U	1.00	50.0	56.6	113	47 - 138	50.0	54.9	110	3	30
Carbon disulfide	75-15-0	1.00U	1.00	50.0	55.1	110	69 - 136	50.0	54.2	108	2	30
Carbon tetrachloride	56-23-5	1.00U	1.00	50.0	53.6	107	76 - 128	50.0	52.6	105	2	30
Chlorobenzene	108-90-7	1.00U	1.00	50.0	52.0	104	74 - 123	50.0	50.9	102	2	20
Chloroethane	75-00-3	1.00U	1.00	50.0	65.4	131	62 - 141	50.0	63.0	126	4	30
Chloroform	67-66-3	1.00U	1.00	50.0	53.3	107	75 - 122	50.0	52.3	105	2	30
Chloromethane	74-87-3	1.00U	1.00	50.0	52.4	105	59 - 132	50.0	46.5	93	12	30
cis-1,2-Dichloroethene	156-59-2	1.00U	1.00	50.0	53.3	107	73 - 130	50.0	52.0	104	2	30
cis-1,3-Dichloropropene	10061-01-5	1.00U	1.00	50.0	55.6	111	71 - 132	50.0	55.8	112	0	30
Cyclohexane	110-82-7	1.00U	1.00	50.0	51.9	104	69 - 132	50.0	51.2	102	1	30
Dibromochloromethane	124-48-1	1.00U	1.00	50.0	53.8	108	71 - 123	50.0	56.2	112	4	30
Dichlorodifluoromethane	75-71-8	1.00U	1.00	50.0	51.9	104	58 - 140	50.0	49.8	100	4	30
Ethylbenzene	100-41-4	1.00U	1.00	50.0	51.1	102	74 - 126	50.0	50.3	101	2	30
Isopropylbenzene (Cumene)	98-82-8	1.00U	1.00	50.0	53.8	108	71 - 125	50.0	52.2	104	3	30
Methyl Acetate	79-20-9	1.00U	1.00	50.0	41.5	83	57 - 139	50.0	40.5	81	2	30
Methylcyclohexane	108-87-2	1.00U	1.00	50.0	51.8	104	67 - 138	50.0	50.5	101	3	30
Methylene chloride	75-09-2	1.00U	1.00	50.0	52.2	104	68 - 132	50.0	50.7	101	3	30
Styrene	100-42-5	1.00U	1.00	50.0	55.6	111	71 - 127	50.0	54.2	108	3	30
tert-Butyl methyl ether (MTBE)	1634-04-4	1.00U	1.00	50.0	50.9	102	71 - 125	50.0	52.1	104	2	30
Tetrachloroethene	127-18-4	1.00U	1.00	50.0	52.5	105	68 - 128	50.0	51.8	104	1	30
Toluene	108-88-3	1.00U	1.00	50.0	49.6	99	72 - 120	50.0	50.1	100	1	20
trans-1,2-Dichloroethene	156-60-5	1.00U	1.00	50.0	51.3	103	69 - 132	50.0	50.0	100	3	30
trans-1,3-Dichloropropene	10061-02-6	1.00U	1.00	50.0	56.2	112	71 - 131	50.0	56.2	112	0	30
Trichloroethene	79-01-6	1.00U	1.00	50.0	51.1	102	76 - 129	50.0	50.1	100	2	20
Trichlorofluoromethane	75-69-4	1.00U	1.00	50.0	58.1	116	72 - 136	50.0	56.9	114	2	30
Trichlorotrifluoroethane	76-13-1	1.00U	1.00	50.0	58.3	117	72 - 136	50.0	54.9	110	6	30
Vinyl chloride	75-01-4	1.00U	1.00	50.0	51.9	104	68 - 132	50.0	50.7	101	2	30
Xylene (total)	1330-20-7	1.00U	1.00	150	162	108	74 - 127	150	157	105	3	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	51.2	102	50	52	104	71 - 127	50	50.6	101	3	NA
4-Bromofluorobenzene	460-00-4	51.2	102	50	53.4	107	78 - 130	50	52.3	105	2	NA
Dibromofluoromethane	1868-53-7	54.2	108	50	52	104	77 - 127	50	52.9	106	2	NA
Toluene d8	2037-26-5	49.6	99	50	49.5	99	76 - 134	50	50	100	1	NA

Inorganics QC Summary

Analytical Batch	Client ID	MB562586		LCS562586			
563337	GCAL ID	1464320		1464321			
Prep Batch	Sample Type	MB		LCS			
562586	Prep Date	07/09/2015 16:15		07/09/2015 16:15			
Prep Method	Analysis Date	07/17/2015 04:05		07/17/2015 04:09			
EPA 3010A	Matrix	Water		Water			
EPA 6020A		Units Result	ug/L LOQ	Spike Added	Result	%R	Control Limits%R
Manganese	7439-96-5	5.00U	5.00	50.0	53.3	107	80 - 120
Sodium	7440-23-5	100U	100	5000	5130	103	80 - 120

General Chemistry QC Summary

Analytical Batch 562731	Client ID	MB562731		LCS562731			
	GCAL ID	1464960		1464961			
	Sample Type	MB		LCS			
	Prep Date	NA		NA			
	Analysis Date	07/10/2015 12:53		07/10/2015 12:36			
	Matrix	Water		Water			
EPA 300.0, Rev 2.1		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R
Chloride	16887-00-6	0.200U	0.200	2.50	2.42	97	80 - 120

Analytical Batch 562731	Client ID	MW-5A		1461814MS				1461814MSD				
	GCAL ID	21507011901		1464962				1464963				
	Sample Type	SAMPLE		MS				MSD				
	Prep Date	NA		NA				NA				
	Analysis Date	07/10/2015 23:20		07/10/2015 23:38				07/10/2015 23:55				
	Matrix	Water		Water				Water				
EPA 300.0, Rev 2.1		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Chloride	16887-00-6	2.60	1.00	12.5	14.9	98	80 - 120	12.5	14.9	98	0	15

Analytical Batch 562731	Client ID	IW-2B		1464576MS				1464576MSD				
	GCAL ID	21507093724		1464964				1464965				
	Sample Type	SAMPLE		MS				MSD				
	Prep Date	NA		NA				NA				
	Analysis Date	07/10/2015 21:01		07/10/2015 21:18				07/10/2015 21:36				
	Matrix	Water		Water				Water				
EPA 300.0, Rev 2.1		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Chloride	16887-00-6	28.9	10.0	125	151	98	80 - 120	125	150	97	1	15

GCAL ANALYTICAL LABORATORIES, LLC

7979 Innovation Park Dr., Baton Rouge, LA 70820-7402
Phone: 225.769.4900 • Fax: 225.767.5717 • www.gcal.com

CHAIN OF CUSTODY RECORD

Client ID: 4783 - ERM NC, INC
SDG: 215070937

Report to:	Bill to:
Client: ERM NC, INC	Client:
Address: 15720 BRIXHAM HILL AVE, SUITE 120	Address:
Contact: MICHAEL PRESSLEY	Contact:
Phone: 704-409-3438	Phone:
E-mail: michael.pressley@erm.com	E-mail:

P.O. Number

Project Name/Number: 0253066 / JOSLYN CLARK

Sampled By: A. NEAL

GCAL use only:
Custody Seal used ☑ yes ☐ no
intact ☑ yes ☐ no 1.0
Temperature °C 3.2 E24
24/445,2

☐ Dissolved Analysis Requested
☐ Field filtered
☐ Lab filtered

Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No Containers	Analytical Requests & Method: VOCs by EPA Method 8260 HCl	Preservative
W	7-6-15	1405		X	MW-1	3	X	1
		1455			MW-4			2
		1550			MW-5			3
		1650			MW-12D			4
		1745			MW-12			5
	7-7-15	0745			MW-10D			6
		0830			MW-10			7
		0935			MW-8			8
		1025			MW-6			9
		1115			MW-3D			10
		1220			MW-7			11
		1530			MW-11D			12
		1620			MW-11			13

Air Bill No: 8075 1449 0565, 8075 1449 0554

Turn Around Time (Business Days): ☐ 24h* ☐ 48h* ☐ 3 days* ☐ 1 week* ☑ Standard (Per Contract/Quote)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	7-8-15	1600	FEDEX		
Fed Ex	7/9/15	1013		7/9/15	1013
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Note: 1 of 2

By submitting these samples, you agree to GCAL's terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = solid, L = liquid, T = tissue

*Requires prior approval, rush charges may apply.

We cannot accept verbal changes. Please email written changes to your PM.

WHITE: CLIENT FINAL REPORT - CANARY: CLIENT

GCAL ANALYTICAL LABORATORIES, LLC

7979 Innovation Park Dr., Baton Rouge, LA 70820-7402
Phone: 225.769.4900 • Fax: 225.767.5717 • www.gcal.com

CHAIN OF CUSTODY RECORD

GCAL USE ONLY

Report to:
Client: ERM NC, INC
Address: 15720 BRIXHAM HILL AVE, SUITE 120
Contact: MICHAEL PRESSLEY
Phone: 704-409-3438
E-mail: michael.pressley@erm.com

Bill to:
Client:
Address:
Contact:
Phone:
E-mail:

P.O. Number
Project Name/Number: 0253066 / JOSLYN CLARK
Sampled By: A. NEAL

Analytical Requests & Method

GCAL use only:
Custody Seal
used ☐ yes ☐ no
intact ☐ yes ☐ no
Temperature °C 3.2 E24
1.0

☐ Dissolved Analysis Requested
☐ Field filtered
☐ Lab filtered

	Matrix[1]	Date	Time (2400)	Comp	Grab	Sample Description	No Containers	HCl	HNO3	Preservative
14	W	7-7-15	—		X	DUP-1	3	X		
15			—			DUP-2				
16			1715			MW-11I				
17		7-8-15	1010			MW-9				
18		7-7-15	1800			Eq-Rinse-1				
19		7-8-15	1330			Eq-Rinse-2				
20		—	—		—	TRIP BLANK				
21		7-7-15	1420		X	MW-2	5	X	X	* MW-2 VOAs preserved with HCl
22		7-8-15	0835			OW-1		*		
23			1110			MW-3		*		
24			1135			IW-2B		*		
25			1155			IW-2A		*		
26			1220			IW-1B		*		
27			1255			IW-1A		*		

All Bill No:

* VOAs preserved with 2 tablets of 1,000 mg Vitamin C tablets instead of HCl

Turn Around Time (Business Days): ☐ 24h* ☐ 48h* ☐ 3 days* ☐ 1 week* ☑ Standard (Per Contract/Quote)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
[signature]	7-8-15	1600	FEDEX		
FEDEX	7/9/15	1013	[signature]	7/9/15	1013

Note: 2 of 2

By submitting these samples, you agree to GCAL's terms and conditions contained in our most recent schedule of services.

Matrix[1]: W = water, S = solid, L = liquid, T = tissue

*Requires prior approval, rush charges may apply.

We cannot accept verbal changes. Please email written changes to your PM.

WHITE: CLIENT FINAL REPORT - CANARY: CLIENT

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

215070937

SAMPLE DELIVERY GROUP 215070937	
Client PM BJM 4783 - ERM NC, INC	**Transport Method** FEDEX
Profile Number 241445	**Received By** Lofton, Katie E.
Line Item(s) 2 - Water 3 - Water - VOC/Na,Mn/Cl	**Receive Date(s)** 07/09/15

CHECKLIST	YES	NO	NA
Were all samples received using proper thermal preservation?	☑	☐	☐
When used, were all custody seals intact?	☑	☐	☐
Were all samples received in proper containers?	☑	☐	☐
Were all samples received using proper chemical preservation?	☑	☐	☐
Was preservative added to any container at the lab?	☐	☑	☐
Were all containers received in good condition?	☑	☐	☐
Were all VOA vials received with no head space?	☑	☐	☐
Do all sample labels match the Chain of Custody?	☑	☐	☐
Did the Chain of Custody list the sampling technician?	☑	☐	☐
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☐	☑	☐

COOLERS

Airbill	Thermometer ID: E24	Temp(°C)
8075 1449 0565		3.2
8075 1449 0554		1.0

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.4

Page 1 of 1

http://webserver1/GCAL_Intranet/Secure/WO_Checklist2.aspx 7/9/2015

Appendix B
Well Logs and Construction Diagrams

10493

D H E C
PROMOTE PROTECT PROSPER

Water Well Record
Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

1. WELL OWNER INFORMATION:
Name: Joslyn Clark (last) (first)
Address: 2013 W. Meeting Street
City: Lancaster State: SC Zip: 29707
Telephone: Work: Home:

2. LOCATION OF WELL: COUNTY: Lancaster
Name: Joslyn Clark
Street Address: 2013 W. Meeting Street
City: Lancaster, SC Zip: 29720
Latitude: Longitude:

3. PUBLIC SYSTEM NAME: MW-12 **PUBLIC SYSTEM NUMBER:**

4. ABANDONMENT: ☐ Yes ☒ No
Give Details Below
Grouted Depth: from _____ ft. to _____ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
orange silty clay	0	27
tan relic structure	27	55
*Indicate Water Bearing Zones (Use a 2nd sheet if needed)		

5. REMARKS:
2"x 55' well drilled with Sonic drill rig

6. TYPE: ☐ Mud Rotary ☐ Jetted ☒ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☐ Other

7. PERMIT NUMBER:

8. USE:
☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☐ Test Well ☒ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) 55' ft. Date Started: 4-28-15 Date Completed: 4-28-15

10. CASING: ☐ Threaded ☐ Welded
Diam.: _____
Type: ☐ PVC ☐ Galvanized ☐ Steel ☐ Other
_____ in. to _____ ft. depth
_____ in. to _____ ft. depth
Height: Above/(Below)
Surface _____ ft.
Weight _____ lb./ft.
Drive Shoe? ☐ Yes ☒ No

11. SCREEN:
Type: PVC Diam.: 2"
Slot/Gauge: .10 Length: 15'
Set Between: _____ ft. and _____ ft.
_____ ft. and _____ ft.
NOTE: MULTIPLE SCREENS USE SECOND SHEET
Sieve Analysis ☐ Yes (please enclose) ☒ No

12. STATIC WATER LEVEL n/a ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
_____ ft. after _____ hrs. Pumping _____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☒ No
Yield: _____

14. WATER QUALITY
Chemical Analysis ☐ Yes ☒ No Bacterial Analysis ☐ Yes ☒ No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☒ Yes ☐ No
Installed from 38 ft. to 55 ft.
Effective size 2a Uniformity Coefficient _____

16. WELL GROUTED? ☒ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☒ Bentonite/Cement ☐ Other _____
Depth: From 0 ft. to 36 ft.

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: _____ ft. _____ direction
Type _____
Well Disinfected ☐ Yes ☒ No Type: _____ Amount: _____

18. PUMP: Date installed: _____ Not installed ☒
Mfr. Name: _____ Model No.: _____
H.P._____ Volts_____ Length of drop pipe_____ ft. Capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

19. WELL DRILLER: Will Keyes CERT. NO.: 2092
Address: (Print) SAEDACCO
9088 Northfield Drive
Level: A (B) C D (circle one)
Telephone No.: (803)548-2180 Fax No.: (803)548-2181

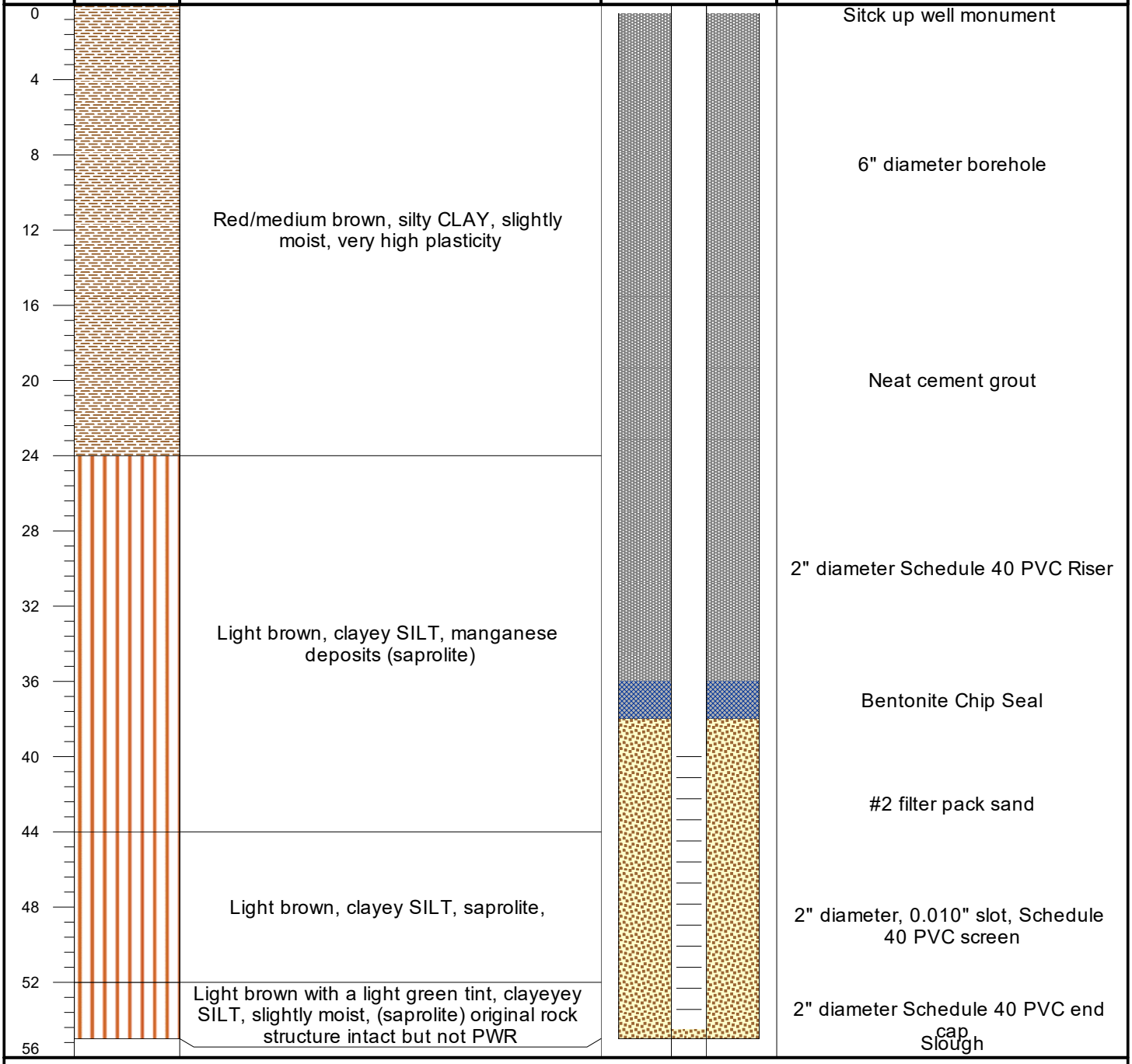
20. WATER WELL DRILLER'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Signed: Will Keyes Date: 4/29/2015
Well Driller

If D Level Driller, provide supervising driller's name:

DHEC 1903 (03/2004) COPY 1 MAIL TO SCDHEC, COPY 2 TO WELL OWNER, COPY 3 TO WELL DRILLER

Client:	Joslyn Clark, LLC	**Boring ID:**	MW-12
Project:	Joslyn Clark	**Logged By:**	Chris Means
Site Location:	Joslyn Clark, Lancaster SC	**Date Started:**	4/28/2015
Project Number:	0238259	**Date Completed:**	4/28/2015



Drilling Contractor:	SAEDACCO	**Sampling Method:**	N/A
Drilling Method:	Sonic Drilling	**Total Depth (ft):**	55
Drilling Equipment:	Geoprobe 8140LS Sonic Rig	**Screened Interval:**	40-55
Responsible Professional:	Will Keyes	**Riser Depth:**	2" Sch.40PVC
Registration No.:	N/A	**Elevation (msl):**	537.72

ERM

Water Well Record
Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

DHEC — PROMOTE PROTECT PROSPER

1. WELL OWNER INFORMATION:
Name: Joslyn Clark (last) (first)
Address: 2013 W. Meeting Street
City: Lancaster State: SC Zip: 29707
Telephone: Work: Home:

2. LOCATION OF WELL: COUNTY: Lancaster
Name: Joslyn Clark
Street Address: 2013 W. Meeting Street
City: Lancaster, SC Zip: 29720
Latitude: Longitude:

3. PUBLIC SYSTEM NAME: MW-12D **PUBLIC SYSTEM NUMBER:**

4. ABANDONMENT: ☐ Yes ☒ No
Give Details Below
Grouted Depth: from _____ ft. to _____ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
orange silty clay	0	27
tan relic structure	27	73'
PWR	73'	85'
Bed Rock	85'	110'
*Indicate Water Bearing Zones (Use a 2nd sheet if needed)		

5. REMARKS: Two feet bentonite seal from 106'to 108'

6. TYPE: ☐ Mud Rotary ☐ Jetted ☒ Bored ☐ Dug ☒ Air Rotary ☐ Driven ☐ Cable tool ☐ Other

7. PERMIT NUMBER:

8. USE:
☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☐ Test Well ☒ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) 110' ft. Date Started: 4-29-15 Date Completed: 4-30'-15

10. CASING: ☒ Threaded ☐ Welded
Diam.: 2"& 6"
Type: ☒ PVC ☐ Galvanized ☐ Steel ☐ Other
0 in. to 100' ft. depth
0 in. to 75' ft. depth
Height: Above/Below
Surface _____ ft.
Weight _____ lb./ft.
Drive Shoe? ☐ Yes ☒ No

11. SCREEN:
Type: PVC Diam.: 2"
Slot/Gauge: .10 Length: 10'
Set Between: 100' ft. and 110' ft.
_____ ft. and _____ ft.
NOTE: MULTIPLE SCREENS USE SECOND SHEET
Sieve Analysis ☐ Yes (please enclose) ☒ No

12. STATIC WATER LEVEL _____ ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
_____ ft. after _____ hrs. Pumping _____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☒ No
Yield: _____

14. WATER QUALITY
Chemical Analysis ☐ Yes ☒ No Bacterial Analysis ☐ Yes ☒ No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☒ Yes ☐ No
Installed from 98' ft. to 110' ft.
Effective size 20/30 Uniformity Coefficient _____

16. WELL GROUTED? ☒ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☒ Bentonite/Cement ☐ Other _____
Depth: From 0 ft. to 96' ft.

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: _____ ft. _____ direction
Type _____
Well Disinfected ☐ Yes ☒ No Type: _____ Amount: _____

18. PUMP: Date installed: _____ Not installed ☒
Mfr. Name: _____ Model No.: _____
H.P. _____ Volts _____ Length of drop pipe _____ ft. Capacity _____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

19. WELL DRILLER: Robert L. Miller CERT. NO. 2092
Address: (Print) SAEDACCO 9088 Northfield Drive
Level: A (B) C D (circle one)
Telephone No.: (803)548-2180 Fax No.: (803)548-2181

20. WATER WELL DRILLER'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.

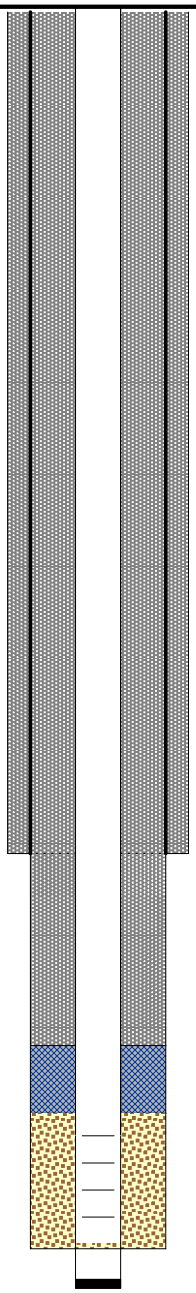
Signed: Robert L. Miller Well Driller Date: 5/4/2015

If D Level Driller, provide supervising driller's name:

DHEC 1903 (03/2004)

COPY 1 MAIL TO SCDHEC, COPY 2 TO WELL OWNER, COPY 3 TO WELL DRILLER

Client:	Joslyn Clark, LLC	**Boring ID:**	MW-12D
Project:	Joslyn Clark	**Logged By:**	Chris Means
Site Location:	Joslyn Clark, Lancaster SC	**Date Started:**	4/28/2015
Project Number:	0238259	**Date Completed:**	4/30/2015

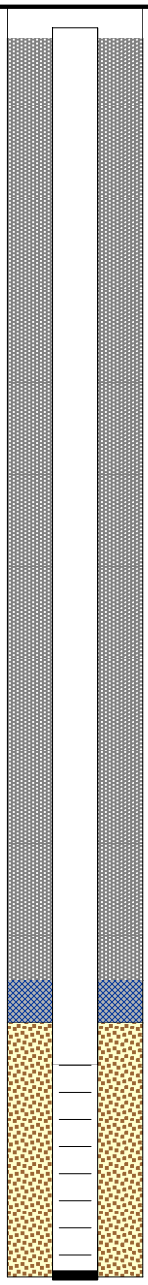
Depth	Lithology	Lithologic Description	Well Construction	Well Construction Details
0				Stick Up Well Monument
10		Red/medium brown, silty CLAY, slightly moist, very high plasticity		Hand auger from ground surface to 5 feet bgs to clear for potential utilities.
20				8" diameter borehole
30		Light brown, clayey SILT, manganese deposits present (Saprolite)		Neat cement grout
40				
50		Light brown, clayey SILT, saprolite		2" diameter Schedule 40 PVC casing
60		Light brown with light green tint, clayey SILT, slightly moist, saprolite Light brown, clayey SILT, with small visible fractures, slightly moist, saprolite		6" diameter, Schdule 40 PVC Outer Casing 0-75' bgs
70				
80				
90		Light brown, clayey SILT, small visible fractures, partially weathered rock		Bentonite Chip Seal #2 filter pack sand 2" diameter, 0.010" slot, Schedule 40 PVC screen
100				
110		Grey, Granite, competant bedrock, very hard		2" diameter Schedule 40 PVC end cap
120				

Drilling Contractor:	SAEDACCO	**Sampling Method:**	N/A
Drilling Method:	Hollow-stem auger/Air Rotary	**Total Depth (ft):**	110
Drilling Equipment:	Gus Pech GP-1100E	**Screened Interval:**	100-110
Responsible Professional:	Robert Miller	**Riser Depth:**	0238259
Registration No.:	N/A	**Elevation (msl):**	537.53

ERM

Client:	Joslyn Clark Facility	**Boring ID:**	OW-1
Project:	Joslyn Clark	**Logged By:**	Thomas Fisher
Site Location:	2013 W. Meeting Street	**Date Started:**	3/7/14
Project Number:	238259	**Date Completed:**	3/7/14

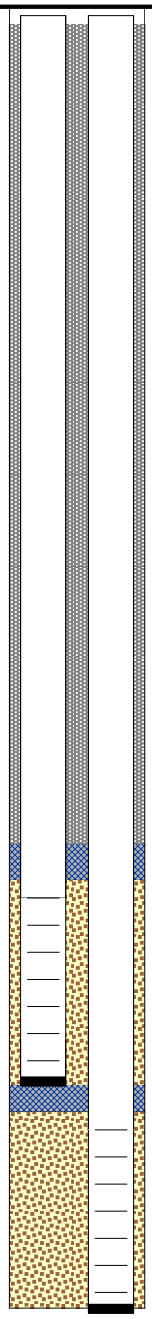
Depth	Lithology	Lithologic Description	Well Construction	Well Construction Details
0		Concrete		Flush Grade Locking Cap
4		Brownish orange fine sandy SILT, slightly plasitc		Portland/Bentonite Grout 8.25" Diameter Borehole
8				2" Sch. 40 PVC Casing
12				
16		Brown fine sandy SILT, slightly dense, slow auger advancement.		
20				
24				
28				
32				
36				
40				
44				
48				Bentonite Seal
52				Well Sand Filter Pack
56				2" Sch. 40 PVC 0.010" Slot Screen
60		Partially Weathered Rock		End Cap
64				



Drilling Contractor:	Saedacco	**Sampling Method:**	Split Spoon
Drilling Method:	HSA	**Total Depth (ft):**	60'
Drilling Equipment:	Diedrich D-50	**Screened Interval:**	50'- 60'
Responsible Professional:	Rich Lemire	**Riser Depth:**	0 - 50'
Registration No.:	1423	**Elevation (msl):**	TBD

ERM

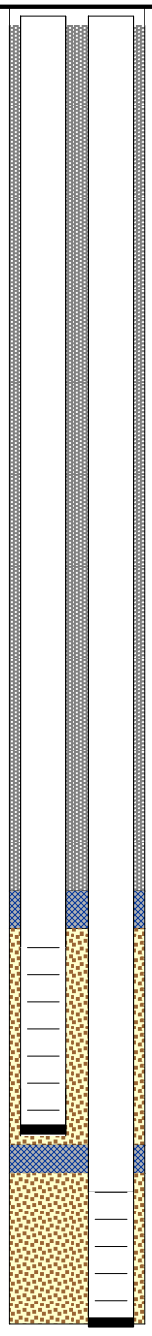
Client:	Joslyn Clark Facility	**Boring ID:**	IW-1
Project:	Joslyn Clark	**Logged By:**	Thomas Fisher
Site Location:	2013 W. Meeting Street	**Date Started:**	3/10/14
Project Number:	238259	**Date Completed:**	3/13/14

Depth	Lithology	Lithologic Description	Well Construction	Well Construction Details
0		Concrete		Flush Grade Locking Cap
4		Brown fine sandy SILT, slightly plastic.		Portland/Bentonite Grout
8		Light brown fine sandy SILT, slightly dense.		
12				
16		Brownish orange fine sandy SILT, slighly dense.		
20		Gray fine sandy SILT, highly weathered, saprolite; @ 29' white fine sandy seams slightly vertical with horizontal intrusions;		10.25 Diameter Borehole
24				
28				2" Sch. 40 PVC Casing
32				
36		Gray and tan fine sandy SILT, with angled/dipping brown hairlike seams; @ 39' vertical layering; gray, white, and brown, fine sandy SILT, H.S.A. refusal at 50'.		
40				
44				
48				Bentonite Seal Well Sand Filter Pack
52		Gray and brown sandy SILT, saprolite, highly weathered, with blocky rock structure at 58' bgs.		**A** - 2" Sch. 40 PVC 0.010" Slot Screen
56				End Cap
60				Bentonite Seal Well Sand Filter Pack
64				**B** - 2" Sch.40 PVC 0.010" Slot Screen
68				
72				End Cap
76				

Drilling Contractor:	Saedacco	**Sampling Method:**	Split Spoon
Drilling Method:	HSA/Air Rotary	**Total Depth (ft):**	60', 73'
Drilling Equipment:	Diedrich D-50	**Screened Interval:**	50'-60', 63'-73'
Responsible Professional:	Rich Lemire	**Riser Depth:**	0 - 50', 0 - 63'
Registration No.:	1423	**Elevation (msl):**	TBD

ERM

Client:	Joslyn Clark Facility	**Boring ID:**	IW-2
Project:	Joslyn Clark	**Logged By:**	Thomas Fisher
Site Location:	2013 W. Meeting Street	**Date Started:**	3/10/14
Project Number:	238259	**Date Completed:**	3/13/14

Depth	Lithology	Lithologic Description	Well Construction	Well Construction Details
0		Concrete		Flush Grade Locking Cap
4		Brown fine sandy SILT, slightly plastic.		Portland/Bentonite Grout
8		Light brown and gray fine sandy SILT, vertical layering at 9'-11', slightly dense.		
12				
16		Brownish orange fine sandy SILT, slightly dense, weathered manganese deposits present in hairlike seams.		10.25 Diameter Borehole
20				
24				
28				2, 2" Sch. 40 PVC Casings
32		Gray fine sandy SILT with angled layering, saprolite.		
36				
40				
44				
48				Bentonite Seal Well Sand Filter Pack
52		Brown to brownish orange silty SAND with angled layering and some high angled seams, saprolite.		**A** - 2" Sch. 40 PVC 0.010" Slot Screen
56		Gray highly weathered rock with highly friable rock fragments.		
60				End Cap Bentonite Seal Well Sand Filter Pack
64		Light brown weathered rock, blocky, some friable, H.S.A. refusal @ 70'.		**B** - 2" Sch.40 PVC 0.010" Slot Screen End Cap
68				
72				

Drilling Contractor:	Saedacco	**Sampling Method:**	Split Spoon
Drilling Method:	HSA	**Total Depth (ft):**	60', 70'
Drilling Equipment:	Diedrich D-50	**Screened Interval:**	50'-60', 63'-70'
Responsible Professional:	Rich Lemire	**Riser Depth:**	0 - 50', 0 - 63'
Registration No.:	1423	**Elevation (msl):**	TBD

ERM

Appendix C
Monitor Well Sampling Sheets

TABLE 1
GROUNDWATER SAMPLE ANALYSES
JOSLYN CLARK FACILITY
LANCASTER, SOUTH CAROLINA

7-6-15

Water Levels	Well ID	Total Depth	VOCs	Sodium	Manganese	Chloride	Notes
42.43	MW-1	55	X				
40.14	MW-2	55	X	X	X	X	
42.49	MW-3	55	X	X	X	X	VOC bottles without HCL
44.66	MW-3D	110	X				
43.02	MW-4	55	X				
44.57	MW-5	55	X				
46.94	MW-6	55	X				
47.60	MW-7	55	X				
43.35	MW-8	55	X				
44.90	MW-9	55	X				
41.22	MW-10	60	X				
41.16	MW-10D	110	X				
42.61	MW-11	55	X				
42.62	MW-11I	100	X				
42.55	MW-11D	150	X				
43.91	MW-12	55	X				
43.44	MW-12D	110	X				
42.40	IW-1A	60	X	X	X	X	VOC bottles without HCL
42.45	IW-1B	73	X	X	X	X	VOC bottles without HCL
42.37	IW-2A	60	X	X	X	X	VOC bottles without HCL
42.46	IW-2B	70	X	X	X	X	VOC bottles without HCL
42.43	OW-1	60	X	X	X	X	VOC bottles without HCL
	Dup-1	---	X				
	Dup-2	---	X				
	Eq Rinse -1	---	X				
	Eq Rinse -2	---	X				
	Trip Blank	---	X				
	Extra Set	---	X	X	X	X	
	Total	1568	28	8	8	8	

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark Job #: 0253066

Sample Type: Circle one - (Monitor Well), DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-1

Date: 7-6-15

Sampling Personnel: A. NEAL

Weather Conditions: (Sunny), Partly Cloudy, Cloudy, Rain; Other_____

Time: 1405

Well Type: Flush Surface Completion, (Stick Up Completion) **Well Tag Present:** (Yes), No

Well Locked: (Yes) No **Lock Present:** (Yes), No **Well ID info. on Tag:** (Yes) No

Well Bolted: Yes, No **Well Cap:** (Yes), No **Well Cap Condition:** (Good), Replace, Other:_____

Well Pad Condition: (Good) Cracked, Replace, Other:_____ **Well Location:** (Grass), Asphalt, Concrete, Woods, Other:_____

Additional Comments:

Total Depth of Well (T.D.): 55 **Screen Length:** 5, 10, (15), 20 (feet) other:

Depth to Water (D.T.W): [1] 42.43 **Well Diameter:** (2) 4, 6, 8 (inches) other:

Field Parameters measured with: YSI / HANNA **Casing Type:** (PVC), Steel other:

Purge Rate: ~150 mL/min **Sampling Device:** Peristaltic, (Monsoon) Grundfos, Bailer, Other:

Tubing Type: (Polyethylene) Teflon, Other: **Measuring Point:** (TOC) other:

Pump Intake ~~(ft below M.P.)~~: ~49 **Color:** Clear **Odor:** Yes, (No)

Time: (min)	Volume Purged	DTW: (feet)	Temp (°C)	pH (std units)	SpC (uS/cm)	DO (mg/L)	ORP mV	Turb NTU	
Stabalization Criteria[2]	~~(gallons)~~ L	(see note below)[3]	+/- 3%	+/- 0.1 unit	+/- 3%	+/- 10%	+/- 10 mV	+/- 10%[4]	Comments:
1340	0.5	42.86	22.75	3.52	46	6.76	122.3	15.6	
1345	1.0	43.08	21.36	6.08	45	5.49	108.1	16.9	
1350	1.5	43.29	20.92	6.15	42	4.87	91.1	20.2	
1355	2.0	43.34	20.86	6.15	40	4.92	83.2	18.9	
1400	2.5	43.41	20.98	6.17	40	4.99	79.4	20.4	
1405 — SAMPLE TIME									

Official Sampling Date & Time: 7-6-15 / 1405

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1	VOCs	HCl	~~7~~ 14	GCAL

Notes:
(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.
(2) - Stabilization criteria based on three most recent consecutive measurements.
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft).
(4) +/- 10% when turbidity is over 10 NTUs.

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark — Job #: 0253066

Sample Type: Circle one: (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-2

Date: 7-7-15

Sampling Personnel: A. NEAL

Weather Conditions: (Sunny,) Partly Cloudy, Cloudy, Rain; Other _____

Time: 1420

Well Type: (Flush Surface Completion,) Stick Up Completion — Well Tag Present: (Yes,) No

Well Locked: (Yes,) No — Lock Present: Yes, (No) — Well ID info. on Tag: (Yes,) No

Well Bolted: (Yes,) No — Well Cap: (Yes,) No — Well Cap Condition: (Good,) Replace, Other: _____

Well Pad Condition: (Good,) Cracked, Replace, Other: _____ — Well Location: Grass, Asphalt, (Concrete,) Woods, Other: _____

Additional Comments:

Total Depth of Well (T.D.): 55 — Screen Length: 5, 10, (15) 20 ~~Test~~ other:

Depth to Water (D.T.W): (1) 40.14 — Well Diameter: (2) 4, 6, 8 ~~inches~~ other:

Field Parameters measured with: YSI / HANNA — Casing Type: (PVC) Steel other:

Purge Rate: ~150 mL/min — Sampling Device: Peristaltic, (Monsoon) Grundfos, Bailer, Other:

Tubing Type: Polyethylene, Teflon, Other: — Measuring Point: (TOC) other:

Pump Intake (~~ft below M.P.~~): 47 — Color: Clear — Odor: Yes, (No)

Time: (min) Stabalization Criteria[2]	Volume Purged (gallons)	DTW: (feet) (see note below)[3]	Temp (°C) +/- 3%	pH (std units) +/- 0.1 unit	SpC (uS/cm) +/- 3%	DO (mg/L) +/- 10%	ORP mV +/- 10 mV	Turb NTU +/- 10%[4]	Comments:
1350	0.5	40.81	20.83	5.54	47	5.98	144.7	21.7	
1355	1.0	40.98	20.65	5.57	46	5.17	140.5	21.4	
1400	1.5	41.20	20.63	5.61	45	5.08	136.9	23.2	
1405	2.0	41.23	20.98	5.64	46	4.91	131.6	26.8	
1410	2.5	41.29	20.80	5.67	48	4.90	129.2	25.3	
1415	3.0	41.41	20.71	5.65	44	4.86	130.1	25.7	
1420 — SAMPLE TIME									

Official Sampling Date & Time: 7-7-15 / 1420

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1 (3 total)	VOCs, Na+, Mn, Cl-	HCl,	14	GCAL
1		HNO3	?	
1				

Notes:
(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.
(2) - Stabilization criteria based on three most recent consecutive measurements.
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft).
(4) +/- 10% when turbidity is over 10 NTUs.

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark **Job #:** 0253088

Sample Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-3

Date:

Sampling Personnel:

Weather Conditions: Sunny, Partly Cloudy, Cloudy, Rain; Other _____

Time: 1110

Well Type: (Flush Surface Completion) Stick Up Completion **Well Tag Present:** (Yes) No

Well Locked: (Yes) No **Lock Present:** (Yes) No **Well ID info. on Tag:** (Yes) No

Well Bolted: (Yes) No **Well Cap:** (Yes) No **Well Cap Condition:** (Good) Replace, Other: _____

Well Pad Condition: (Good) Cracked, Replace, Other: _____ **Well Location:** Grass, Asphalt, (Concrete), Woods, Other: _____

Additional Comments:

Total Depth of Well (T.D.): 55 **Screen Length:** 5, 10, (15), 20 (feet) other: _____

Depth to Water (D.T.W): [1] 42.49 **Well Diameter:** (2), 4, 6, 8 (inches) other: _____

Field Parameters measured with: NA **Casing Type:** (PVC) Steel other: _____

Purge Rate: NA mL/min **Sampling Device:** Peristaltic, Monsoon, Grundfos, (Bailer), Other: _____

Tubing Type: Polyethylene, Teflon, Other: NA **Measuring Point:** (TOC) other: _____

Pump Intake (ft below M.P.): NA **Color:** Purple **Odor:** Yes, (No)

Time: (min)	Volume Purged	DTW: (feet)	Temp (°C)	pH (std units)	SpC (uS/cm)	DO (mg/L)	ORP mV	Turb NTU	Comments:
Stabalization Criteria[4]	(gallons)	(see note below)[3]	+/- 3%	+/- 0.1 unit	+/- 3%	+/- 10%	+/- 10 mV	+/- 10%[4]	
SAMPLE TIME = 1110									

Official Sampling Date & Time: _____

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
3	VOCs, Na^+ & Mn, Cl^-	HCl, HNO_3	14, ?	GCAL

Notes:
(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.
(2) - Stabilization criteria based on three most recent consecutive measurements.
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft).
(4) +/- 10% when turbidity is over 10 NTUs

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark Job #: 0253066

Sample Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other)

Sample ID: MW-31

Date: 7-7-15

Sampling Personnel: A. NEAL

Weather Conditions: (Sunny,) Partly Cloudy, Cloudy, Rain; Other

Time: 1115

Well Type: Flush Surface Completion (Stick Up Completion Well Tag Present: (Yes) No

Well Locked: (Yes) No Lock Present: (Yes) No Well ID Info. on Tag: (Yes) No

Well Bolted: Yes, No Well Cap: (Yes) No Well Cap Condition: (Good,) Replace, Other,

Well Pad Condition: (Good,) Cracked, Replace, Other; Well Location: (Grass,) Asphalt, Concrete, Woods, Other;

Additional Comments:

Total Depth of Well (T.D.): 110 Screen Length: 5, (10,) 15, 20 (feet) other;

Depth to Water (D.T.W): (1) 94.66 Well Diameter: 2, 4, 6, 8 (inches) other;

Field Parameters measured with: YSI / HORIBA Casing Type: (PVC) Steel other;

Purge Rate: ~150 ml/min Sampling Device: Peristaltic, (Monsoon,) Grundfos, Bailer, Other;

Tubing Type: (Polyethylene) Teflon, Other; Measuring Point: (TOC) other;

Pump Intake (ft below M.P.): ~80 Color: Clear Odor: Yes, (No)

Time: (min) Stabalization Criteria[2]	Volume Purged 1 (gallons)	DTW: (feet) (see note below)[3]	Temp (°C) +/- 3%	pH (std units) +/- 0.1 unit	SpC (uS/cm) +/- 3%	DO (mg/L) +/- 10%	ORP mV +/- 10 mV	Turb NTU +/- 10%[4]	Comments:
1045	0.5	94.86	21.56	7.19	106	5.54	109.1	6.68	
1050	1.0	94.91	21.68	7.20	106	5.18	102.0	7.05	
1055	1.5	94.91	21.63	7.41	105	4.96	93.4	6.67	
1100	2.0	94.85	21.60	7.46	105	4.85	92.5	2.03	
1105	2.5	94.90	21.59	7.46	105	4.79	91.6	1.12	
1110	3.0	94.91	21.57	7.47	105	4.82	92.8	0.76	
1115	SAMPLE TIME								

Official Sampling Date & Time: 7-7-15 / 1125

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1	VOCs	HCl.	14	GCAL

Notes:
(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom
(2) - Stabilization criteria based on three most recent consecutive measurements
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft)
(4) +/- 10% when turbidity is over 10 NTUs

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark Job #: 0253066

Sample Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-4

Date: 7-6-15

Sampling Personnel: A. VEAL

Weather Conditions: Sunny, (Partly Cloudy), Cloudy, Rain; Other _____

Time: 1455

Well Type: Flush Surface Completion (Stick Up Completion) Well Tag Present: (Yes) No

Well Locked: (Yes) No Lock Present: (Yes) No Well ID info. on Tag: (Yes) No

Well Bolted: Yes, No Well Cap: (Yes) No Well Cap Condition: (Good) Replace, Other: _____

Well Pad Condition: (Good) Cracked, Replace, Other: _____ Well Location: (Grass), Asphalt, Concrete, Woods, Other: _____

Additional Comments:

Total Depth of Well (T.D.): 55 Screen Length: 5, 10, (15) 20 (feet) other:

Depth to Water (D.T.W.): (1) ~~43.02~~ 43.02 Well Diameter: (2), 4, 6, 8 (Inches) other:

Field Parameters measured with: YSI / Horiba Casing Type: (PVC) Steel other:

Purge Rate: ~150 mL/min Sampling Device: Peristaltic (Monsoon) Grundfos, Bailer, Other:

Tubing Type: (Polyethylene), Teflon, Other: Measuring Point: (TOC) other:

Pump Intake (~~ft below M.P.~~): 49 Color: Clear Odor: Yes (No)

Time: (min)	Volume Purged	DTW: (feet)	Temp (°C)	pH (std units)	SpC (uS/cm)	DO (mg/L)	ORP mV	Turb NTU	
Stabalization Criteria[2]	L (gallons)	(see note below)[3]	+/- 3%	+/- 0.1 unit	+/- 3%	+/- 10%	+/- 10 mV	+/- 10%[4]	Comments:
1425	0.5	~~43.18~~	19.96	6.57	68	4.97	83.2	246	
1430	1.0	43.56	19.59	6.59	80	4.62	82.9	121	
1435	1.5	44.95	19.49	6.61	~~72~~ 74	4.44	82.4	39.0	
1440	2.0	44.51	20.04	6.56	72	4.31	81.5	27.4	
1445	2.5	45.02	20.05	6.58	70	4.28	83.5	28.1	
1450	3.0	45.18	20.33	6.57	70	4.27	84.4	25.9	
1455 → SAMPLE TIME.									

Official Sampling Date & Time: 7-6-15

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1	VOCs	HCl	14	GCAL

Notes:

(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom

(2) - Stabilization criteria based on three most recent consecutive measurements

(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft)

(4) +/- 10% when turbidity is over 10 NTUs.

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark — Job #: 0253066

Sample Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-5

Date: 7-6-15

Sampling Personnel: A. NEAL

Weather Conditions: Sunny, Partly Cloudy, Cloudy, Rain; Other _____

Time: 1550

Well Type: Flush Surface Completion, Stick Up Completion — **Well Tag Present:** Yes, No

Well Locked: Yes, No — **Lock Present:** Yes, No — **Well ID Info. on Tag:** Yes, No

Well Bolted: Yes, No — **Well Cap:** Yes, No — **Well Cap Condition:** Good, Replace, Other: _____

Well Pad Condition: Good, Cracked, Replace, Other: _____ — **Well Location:** Grass, Asphalt, Concrete, Woods, Other: _____

Additional Comments:

Total Depth of Well (T.D.): 55 — **Screen Length:** 5, 10, 15, 20, feet, other:

Depth to Water (D.T.W): (1) 44.51 — **Well Diameter:** 2", 4, 6, 8, inches, other:

Field Parameters measured with: YSI / HANNA — **Casing Type:** PVC, Steel, other:

Purge Rate: ~150 mL/min — **Sampling Device:** Peristaltic, Monsoon, Grundfos, Bailer, Other:

Tubing Type: Polyethylene, Teflon, Other: — **Measuring Point:** TOC, other:

Pump Intake (ft ~~below M.P.~~): 50 — **Color:** — **Odor:** Yes, NO

Time: (min) Stabalization Criteria[2]	Volume Purged (gallons)	DTW: (feet) (see note below)[3]	Temp (°C) +/- 3%	pH (std units) +/- 0.1 unit	SpC (uS/cm) +/- 3%	DO (mg/L) +/- 10%	ORP mV +/- 10 mV	Turb NTU +/- 10%[4]	Comments:
1520	0.5	44.89	20.05	5.96	131	7.09	153.7	63.9	
1525	1.0	44.11	20.07	6.08	130	6.41	136.5	62.5	
1530	1.5	45.21	20.12	6.17	131	5.88	126.2	42.4	
1535	2.0	45.25	20.45	6.21	133	5.81	119.1	31.2	
1540	2.5	45.29	20.62	6.22	134	5.78	118.1	33.6	
~~1545~~ 1550	SAMPLE TIME								

Official Sampling Date & Time: 7-6-15 / 1550

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
2	VOCs	HCl	14	GCAL

Notes:

(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.
(2) - Stabilization criteria based on three most recent consecutive measurements.
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft).
(4) +/- 10% when turbidity is over 10 NTUs.

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark — Job #: 0253066

Sample Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-6

Date: 7-7-15

Sampling Personnel: A. NEAL

Weather Conditions: (Sunny,) Partly Cloudy, Cloudy, Rain; Other _____

Time: 1025

Well Type: Flush Surface Completion, (Stick Up Completion) — Well Tag Present: (Yes,) No

Well Locked: (Yes,) No — Lock Present: (Yes,) No — Well ID Info. on Tag: (Yes,) No

Well Bolted: Yes, No — Well Cap: (Yes) No — Well Cap Condition: (Good,) Replace, Other: _____

Well Pad Condition: (Good,) Cracked, Replace, Other: _____ — Well Location: (Grass,) Asphalt, Concrete, Woods, Other: _____

Additional Comments:

Total Depth of Well (T.D.): 55 — Screen Length: 5, 10, (15) 20 (feet) Other: _____

Depth to Water (D.T.W): (1) 46.94 — Well Diameter: (2) 4, 6, 8 (inches) Other: _____

Field Parameters measured with: ~~Re~~ YSI/HANNA — Casing Type: (PVC) Steel other: _____

Purge Rate: ~150 mL/min — Sampling Device: Peristaltic, (Monsoon,) Grundfos, Bailer, Other: _____

Tubing Type: (Polyethylene,) Teflon, Other: _____ — Measuring Point: (TOC) other: _____

Pump Intake (~~ft below M.P.~~): 51 — Color: Clear — Odor: Yes, (No)

Time: (min)	Volume Purged	DTW: (feet)	Temp (°C)	pH (std units)	SpC (uS/cm)	DO (mg/L)	ORP mV	Turb NTU	
Stabalization Criteria[2]	(gallons)	(see note below)[3]	+/- 3%	+/- 0.1 unit	+/- 3%	+/- 10%	+/- 10 mV	+/- 10%[4]	Comments:
1000	0.5	47.44	20.20	6.04	73	2.6	130.2	36.8	
1005	1.0	47.62	20.28	6.11	73	1.34	119.8	36.3	
1010	1.5	47.71	20.41	6.26	71	0.86	110.8	34.7	
1015	2.0	47.89	20.65	6.31	71	0.84	108.1	33.8	
1020	2.5	46.36	20.71	6.33	70	0.83	104.3	33.1	
1025	SAMPLE TIME								

Official Sampling Date & Time: 7-7-15 / 1025

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1	VOCs	HCl	14	GCAL

Notes:

(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.

(2) - Stabilization criteria based on three most recent consecutive measurements

(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft)

(4) +/- 10% when turbidity is over 10 NTUs

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark — Job #: 0253066

Sample Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-7

Date: 7-7-15

Sampling Personnel: ALEX

Weather Conditions: (Sunny) Partly Cloudy, Cloudy, Rain, Other _____

Time: 1220

Well Type: Flush Surface Completion (Stick Up Completion)

Well Tag Present: (Yes) No

Well Locked: (Yes) No — Lock Present: (Yes) No

Well ID info. on Tag: (Yes) No

Well Bolted: Yes (No) — Well Cap: (Yes) No

Well Cap Condition: (Good) Replace, Other _____

Well Pad Condition: (Good) Cracked, Replace, Other _____

Well Location: Grass, (Asphalt) Concrete, Woods, Other _____

Additional Comments:

Total Depth of Well (T.D.): 55

Screen Length: 5, 10, (15) 20, Other

Depth to Water (D.T.W): (1) 47.60

Well Diameter: (2) 4, 6, 8, inches-other

Field Parameters measured with: YSI/HANNA

Casing Type: (PVC) Steel, other

Purge Rate: 150 mL/min

Sampling Device: Peristaltic, Monsoon, Grundfos, Bailer, Other

Tubing Type: (Polyethylene) Teflon, Other:

Measuring Point: (TOC), other

Pump Intake (ft below M.P.): 52

Color: Clear (Murky) Odor: Yes (No)

Time: (min)	Volume Purged	DTW: (feet)	Temp (°C)	pH (std units)	SpC (uS/cm)	DO (mg/L)	ORP mV	Turb NTU	
Stabalization Criteria[4]	L (gallons)	(see note below)[3]	+/- 3%	+/- 0.1 unit	+/- 3%	+/- 10%	+/- 10 mV	+/- 10%[4]	Comments:
1150	0.5	48.09	31.69	5.50	73	5.11	154.7	43.3	
1155	1.0	48.14	31.71	5.47	69	4.69	148.8	45.7	
1200	1.5	48.24	31.73	5.50	69	4.55	141.1	41.9	
1205	2.0	48.29	31.74	5.51	69	4.62	134.0	41.4	
1210	2.5	48.30	31.72	5.53	69	4.63	136.5	39.6	
1215	3.0	48.32	31.71	5.57	69	4.62	135.5	57.8	
1220 — SAMPLE TIME									
*	Dup-1								

Official Sampling Date & Time: 7-7-15 / 1220

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1	VOCs	HCl	14	GCAL
* Dup-1				

Notes:
(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom
(2) - Stabilization criteria based on three most recent consecutive measurements
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft)
(4) +/- 10% when turbidity is over 10 NTUs

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark Job #: 0253066

Sample Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-8

Date: 7-7-15

Sampling Personnel: A. NEAL

Weather Conditions: (Sunny) Partly Cloudy, Cloudy, Rain; Other _____

Time: 935

Well Type: Flush Surface Completion, (Stick Up Completion) Well Tag Present: (Yes) No

Well Locked: (Yes) No Lock Present: (Yes) No Well ID Info. on Tag: (Yes) No

Well Bolted: Yes, No Well Cap: (Yes) No Well Cap Condition: (Good) Replace, Other: _____

Well Pad Condition: (Good) Cracked, Replace, Other: _____ Well Location: (Grass) Asphalt, Concrete, Woods, Other: _____

Additional Comments:

Total Depth of Well (T.D.): 55 Screen Length: 5, 10, (15) 20 (Feet) other:

Depth to Water (D.T.W): (1) 43.35 Well Diameter: (2) 4, 6, 8 (Inches) other:

Field Parameters measured with: YSI / HANNA Casing Type: (PVC) Steel other:

Purge Rate: ~~150~~ 150 mL/min Sampling Device: Peristaltic (Monsoon) Grundfos, Bailer, Other:

Tubing Type: (Polyethylene) Teflon, Other: Measuring Point: (TOC) other:

Pump Intake (~~ft below M.P.~~): 50 Color: Clear Odor: Yes, (No)

Time: (min) Stabalization Criteria[2]	Volume Purged (gallons)	DTW: (feet) (see note below)[3]	Temp (°C) +/- 3%	pH (std units) +/- 0.1 unit	SpC (uS/cm) +/- 3%	DO (mg/L) +/- 10%	ORP mV +/- 10 mV	Turb NTU +/- 10%[4]	Comments:
900	0.5	43.71	20.50	6.46	159	6.13	132.3	66.1	
905	1.0	43.82	20.32	6.51	155	5.22	129.8	38.4	
910	1.5	43.77	20.48	6.61	155	4.91	122.4	22.7	
915	2.0	43.79	20.63	6.69	157	4.81	113.0	20.7	
920	2.5	43.88	20.36	6.77	158	4.83	108.7	18.8	
925	3.0	43.92	20.26	6.79	159	4.80	93.3	15.4	
930	3.5	43.95	20.12	6.83	160	4.81	87.5	13.8	
935 -	SAMPLE TIME								

Official Sampling Date & Time: 7-7-15 / 935

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1	VOCs	HCl	~~14~~ 14	GCAL

Notes:
(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom
(2) - Stabilization criteria based on three most recent consecutive measurements
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft)
(4) +/- 10% when turbidity is over 10 NTUs

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark **Job #:** 0253066

Sample Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-9

Date: 7-8-15

Sampling Personnel: A. NEAL

Weather Conditions: (Sunny) Partly Cloudy, Cloudy, Rain; Other _____

Time: 1010

Well Type: Flush Surface Completion, (Stick Up Completion) **Well Tag Present:** (Yes) No

Well Locked: (Yes) No **Lock Present:** (Yes) No **Well ID Info. on Tag:** (Yes) No

Well Bolted: Yes, No **Well Cap:** (Yes) No **Well Cap Condition:** (Good) Replace, Other: _____

Well Pad Condition: (Good) Cracked, Replace, Other: _____ **Well Location:** (Grass) Asphalt, Concrete, Woods, Other: _____

Additional Comments:

Total Depth of Well (T.D.): 55 **Screen Length:** 5, 10, (15) 20 (feet) other:

Depth to Water (D.T.W): [1] 44.90 **Well Diameter:** (2) 4, 6, 8 (Inches) other:

Field Parameters measured with: YSI/HANNA **Casing Type:** (PVC) Steel other:

Purge Rate: ~150 mL/min **Sampling Device:** Peristaltic (Monsoon) Grundfos, Bailer, Other:

Tubing Type: (Polyethylene) Teflon, Other: **Measuring Point:** (TOC) other:

Pump Intake (ft below M.P.): 51 **Color:** Clear **Odor:** Yes, (No)

Time: (min) Stabalization Criteria[2]	Volume Purged (gallons)	DTW: (feet) (see note below)[3]	Temp (°C) +/- 3%	pH (std units) +/- 0.1 unit	SpC (uS/cm) +/- 3%	DO (mg/L) +/- 10%	ORP mV +/- 10 mV	Turb NTU +/- 10%[4]	Comments:
940	0.5	45.72	19.76	5.08	85	7.30	-2.2		
945	1.0	46.23	20.18	5.36	85	6.63	-2.2		
950	1.5	46.57	20.72	5.71	84	5.11	-2.1		
955	2.0	46.63	20.88	5.85	85	5.10	-2.2		
1000	2.5	46.66	21.13	5.87	85	5.09	-2.2		
1005	3.0	46.72	21.24	5.88	85	5.09	-2.2		
1010 — SAMPLE TIME									

Official Sampling Date & Time: 7-8-15 / 1010

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1	VOCs	HCl	14	GCAL

Notes:
(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom
(2) - Stabilization criteria based on three most recent consecutive measurements.
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft)
(4) +/- 10% when turbidity is over 10 NTUs

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark — **Job #:** 0253066

Sample Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-10

Date: 7-7-15

Sampling Personnel: ANEAL

Weather Conditions: (Sunny) Partly Cloudy, Cloudy, Rain; Other_____

Time: 836

Well Type: Flush Surface Completion (Stick Up Completion) — **Well Tag Present:** (Yes) No

Well Locked: (Yes) No — **Lock Present:** (Yes) No — **Well ID Info. on Tag:** (Yes) No

Well Bolted: Yes, No — **Well Cap:** (Yes) No — **Well Cap Condition:** (Good) Replace, Other:_____

Well Pad Condition: (Good) Cracked, Replace, Other:_____ — **Well Location:** Grass, Asphalt, Concrete, (Woods), Other:_____

Additional Comments:

Total Depth of Well (T.D.): ~~55~~ 60 — **Screen Length:** 5, 10, (15) 20 (feet) other:

Depth to Water (D.T.W): [1] 41.22 — **Well Diameter:** (2) 4, 6, 8 (inches) other:

Field Parameters measured with: YSI / HANNA — **Casing Type:** (PVC) Steel other:

Purge Rate: ~150 mL/min — **Sampling Device:** Peristaltic, (Monsoon), Grundfos, Bailer, Other:

Tubing Type: (Polyethylene), Teflon, Other: — **Measuring Point:** (TOC) other:

Pump Intake (~~ft below M.P.~~): 50 — **Color:** Clear — **Odor:** Yes, (No)

Time: (min)	Volume Purged	DTW: (feet)	Temp (°C)	pH (std units)	SpC (uS/cm)	DO (mg/L)	ORP mV	Turb NTU	
Stabalization Criteria[2]	(gallons)	(see note below)[3]	+/- 3%	+/- 0.1 unit	+/- 3%	+/- 10%	+/- 10 mV	+/- 10%[4]	Comments:
805	0.5	43.35	18.72	7.28	110	8.33	64.1	—	Turbidity not taken because meter was not working properly but water was fairly clear
810	1.0	43.44	18.65	7.31	110	8.32	62.5		
815	1.5	43.51	18.45	7.33	110	8.41	61.7		
820	2.0	43.58	18.28	7.40	109	8.50	60.2		
825	2.5	43.63	18.22	7.41	109	8.41	59.1		
830 —	SAMPLE TIME								

Official Sampling Date & Time: 7-7-15 / 830

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1	VOCs	HCl	14	GCAL

Notes:

(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.
(2) - Stabilization criteria based on three most recent consecutive measurements.
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft).
(4) +/- 10% when turbidity is over 10 NTUs.

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark Job #: 0253066

Sample Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-10D

Date: 7-7-15

Sampling Personnel: A.NEAL

Weather Conditions: (Sunny), Partly Cloudy, Cloudy, Rain; Other_____

Time: 745

Well Type: Flush Surface Completion, (Stick Up Completion) Well Tag Present: (Yes), No

Well Locked: (Yes), No Lock Present: (Yes), No Well ID info. on Tag: (Yes), No

Well Bolted: Yes, No Well Cap: (Yes), No Well Cap Condition: (Good), Replace, Other:_____

Well Pad Condition: (Good), Cracked, Replace, Other:_____ Well Location: Grass, Asphalt, Concrete, (Woods), Other:_____

Additional Comments:

Total Depth of Well (T.D.): 110 Screen Length: 5, (10), 15, 20 (feet) other:

Depth to Water (D.T.W.): (1) 46.16 Well Diameter: (2) 4, 6, 8 (inches) other:

Field Parameters measured with: YSI / HANNA Casing Type: (PVC), Steel other:

Purge Rate: ~150 mL/min Sampling Device: Peristaltic, (Monsoon), Grundfos, Bailer, Other:

Tubing Type: (Polyethylene), Teflon, Other: Measuring Point: (TOC) other:

Pump Intake (~~ft below M.P.~~): 75 Color: Clear Odor: Yes, (No)

Time: (min) Stabalization Criteria[2]	Volume Purged (gallons)	DTW: (feet) (see note below)[3]	Temp (°C) +/- 3%	pH (std units) +/- 0.1 unit	SpC (uS/cm) +/- 3%	DO (mg/L) +/- 10%	ORP mV +/- 10 mV	Turb NTU +/- 10%[4]	Comments:
710	0.5	45.21	18.62	4.90	148	6.90	227.6	4.94	
715	1.0	45.23	18.66	5.02	148	6.65	242.4	3.86	
720	1.5	45.24	18.98	6.67	147	6.44	137.3	0.05	* CALIBRATION light flashing, tried to calibrate according to user manual but got error message "LO - Err" three times. Will call Eastern Solutions when they are open
725	2.0	45.25	19.14	7.39	148	6.31	79.7		
730	2.5	45.25	19.22	7.43	147	6.30	20.4		
735	3.0	45.25	19.34	7.44	147	6.27	20.3		
~~740~~	SAMPLE TIME								
745									

Official Sampling Date & Time: 7-7-15 / 745

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
#1	VOCs	HCl	14	GCAL

Notes:
(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.
(2) - Stabilization criteria based on three most recent consecutive measurements.
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft).
(4) +/- 10% when turbidity is over 10 NTUs.

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark — Job #: 0253066

Sample Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-11

Date: 7-7-15

Sampling Personnel: J. VERA

Weather Conditions: (Sunny), Partly Cloudy, Cloudy, Rain, Other _____

Time: 1620

Well Type: ~~Flush Surface Completion~~ Stick Up Completion — Well Tag Present: (Yes) No

Well Locked: Yes, No — Lock Present: Yes, No — Well ID info. on Tag: (Yes) No

Well Bolted: Yes, No — Well Cap: (Yes) No — Well Cap Condition: (Good) Replace, Other: _____

Well Pad Condition: (Silt) Cracked, Replace, Other: _____ — Well Location: Grass, Asphalt, (Concrete), Woods, Other: _____

Additional Comments:

Total Depth of Well (T.D.): 55 — Screen Length: 5, (10), 15, 20 (feet) other:

Depth to Water (D.T.W): [1] 42.61 — Well Diameter: (2) 4, 6, 8 (Inches) other:

Field Parameters measured with: YSI/HORIBA — Casing Type: (PVC) Steel other:

Purge Rate: ~150 mL/min — Sampling Device: Peristaltic, (Monsoon), Grundfos, Bailer, Other:

Tubing Type: (Polyethylene) Teflon, Other: — Measuring Point: (TOC) other:

Pump Intake (ft below M.P.): 50 — Color: Clear — Odor: Yes, (No)

Time: (military) / Stabilization Criteria[2]	Volume Purged (gallons)	DTW: (feet) (see note below)[3]	Temp (°C) +/- 3%	pH (std units) +/- 0.1 unit	SpC (uS/cm) +/- 3%	DO (mg/L) +/- 10%	ORP mV +/- 10 mV	Turb NTU +/- 10%[4]	Comments:
1550	0.5	42.68	24.01	6.24	72	4.56	-2.1	118	
1555	1.0	42.70	23.24	6.11	72	4.33	-2.1	61.1	
1600	1.5	42.71	22.56	5.96	68	4.25	-2.1	23.4	
1605	2.0	42.92	22.77	5.94	68	4.21	-2.0	12.1	
1610	2.5	43.03	22.93	5.94	68	4.23	-2.0	8.62	
1615	3.0	43.07	22.70	5.93	68	4.24	-2.0	7.13	
1620 - SAMPLE TIME									
* DUP-02 *									

Official Sampling Date & Time: 7-7-15 / 1620

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
*Dup-2	VOCs	HCl	14	GCAL

Notes:
(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.
(2) - Stabilization criteria based on three most recent consecutive measurements
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft)
(4) - +/- 10% when turbidity is over 10 NTUs.

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark **Job #:** 0253066

Sample Type: Circle one (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-11D

Date: 7-7-15

Sampling Personnel: ALEX

Weather Conditions: (Sunny,) Partly Cloudy, Cloudy, Rain; Other_____

Time: 1530

Well Type: Flush Surface Completion, Stick Up Completion **Well Tag Present:** Yes, (No)

Well Locked: (Yes,) No **Lock Present:** (Yes,) No **Well ID Info. on Tag:** Yes, No NA

Well Bolted: (Yes,) No **Well Cap:** (Yes,) No **Well Cap Condition:** (Good,) Replace, Other:_____

Well Pad Condition: (Good,) Cracked, Replace, Other:_____ **Well Location:** Grass, Asphalt, (Concrete,) Woods, Other:_____

Additional Comments:

Total Depth of Well (T.D.): 150 **Screen Length:** 5, (10,) 15, 20 (feet,) other:

Depth to Water (D.T.W.): (1) 42.55 **Well Diameter:** (2,) 4, 6, 8 (inches,) other:

Field Parameters measured with: YSI/HANNA **Casing Type:** (PVC,) Steel other:

Purge Rate: ~150 mL/min **Sampling Device:** Peristaltic, (Monsoon,) Grundfos, Bailer, Other:

Tubing Type: (Polyethylene,) Teflon, Other: **Measuring Point:** (TOC) other:

Pump Intake (ft below M.P.): ~85 **Color:** Clear **Odor:** Yes, (No)

Time: (min)	Volume Purged	DTW: (feet)	Temp (°C)	pH (std units)	SpC (uS/cm)	DO (mg/L)	ORP mV	Turb NTU	
Stabalization Criteria[2]	~~(gallons)~~	(see note below)[3]	+/- 3%	+/- 0.1 unit	+/- 3%	+/- 10%	+/- 10 mV	+/- 10%[4]	Comments:
1500	0.5	43.29	22.24	6.15	216	6.23	-2.3	7.25	
1505	1.0	43.29	21.56	6.31	214	5.83	-2.2	6.71	
1510	1.5	43.31	21.44	6.47	214	4.78	-2.2	5.41	
1515	2.0	43.34	21.21	6.59	214	4.61	-2.1	4.89	
1520	2.5	43.33	21.18	6.71	214	4.55	-2.1	3.96	
1525	3.0	43.37	21.10	6.96	214	4.56	-2.1	3.37	
1530 — SAMPLE TIME									

Official Sampling Date & Time: 7-7-15 / 1530

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1	VOCs	HCl	14	GCAL

Notes:
(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.
(2) - Stabilization criteria based on three most recent consecutive measurements.
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft).
(4) +/- 10% when turbidity is over 10 NTUs.

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark — **Job #:** 0253066

Sample Type: Circle one: (Monitor Well), DPT, Surface Water, Potable WSW; (other) Injection Well

Sample ID: MW-11I

Date: 7-7-15

Sampling Personnel: A. NEAL

Weather Conditions: (Sunny), Partly Cloudy, Cloudy, Rain; Other

Time: 1713

Well Type: (Flush Surface Completion), Stick Up Completion — **Well Tag Present:** (Yes), No

Well Locked: (Yes), No — **Lock Present:** (Yes), No — **Well ID Info. on Tag:** (Yes), No

Well Bolted: Yes, No — **Well Cap:** (Yes), No — **Well Cap Condition:** (Good), Replace, Other:

Well Pad Condition: (Good), Cracked, Replace, Other: — **Well Location:** Grass, Asphalt, (Concrete), Woods, Other:

Additional Comments:

Total Depth of Well (T.D.): 100 — **Screen Length:** 5, (10), 15, 20 (feet) other:

Depth to Water (D.T.W): (1) 42.62 — **Well Diameter:** (2), 4, 6, 8 (Inches) other:

Field Parameters measured with: YSI / Horiba — **Casing Type:** (PVC), Steel other:

Purge Rate: ~150 mL/min — **Sampling Device:** Peristaltic, Monsoon, Grundfos, Bailer, Other:

Tubing Type: (Polyethylene), Teflon, Other: — **Measuring Point:** (TOC) other:

Pump Intake (ft below M.P.): ~70 — **Color:** Clear — **Odor:** Yes (No)

Time: (min)	Volume Purged	DTW: (feet)	Temp (°C)	pH (std units)	SpC (uS/cm)	DO (mg/L)	ORP mV	Turb NTU	
Stabalization Criteria[2]	(gallons)	(see note below)[3]	+/- 3%	+/- 0.1 unit	+/- 3%	+/- 10%	+/- 10 mV	+/- 10%[4]	Comments:
1645	0.5	43.90	21.49	8.59	164	5.75	-2.1	12.6	
1650	1.0	43.90	21.53	8.62	164	5.31	-2.2	11.1	
1655	1.5	43.89	21.54	8.66	162	5.28	-2.2	2.82	
1700	2.0	43.99	21.56	8.67	162	5.22	-2.2	8.05	
1705	2.5	44.08	21.61	8.69	162	5.20	-2.2	7.89	
1710	3.0	44.10	21.63	8.70	162	5.19	-2.2	7.71	
1715 —	SAMPLE	TIME							

Official Sampling Date & Time: 7-7-15

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1	VOC	HCl	14	GCAL

Notes:
(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.
(2) - Stabilization criteria based on three most recent consecutive measurements.
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft).
(4) +/- 10% when turbidity is over 10 NTUs

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark Job #: 0253066

Sample Type: Circle one (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

Sample ID: MW-12

Date: 7-6-15

Sampling Personnel: A. NEAL

Weather Conditions: (Sunny), (Partly Cloudy), Cloudy, Rain; Other_____

Time: 1745

Well Type: Flush Surface Completion, (Stick Up Completion) Well Tag Present: (Yes), No

Well Locked: Yes, (No) Lock Present: Yes, (No) Well ID Info. on Tag: (Yes), No

Well Bolted: Yes, No Well Cap: (Yes), No Well Cap Condition: (Good), Replace, Other:_____

Well Pad Condition: (Good), Cracked, Replace, Other:_____ Well Location: Grass, Asphalt, Concrete, (Wood), Other:_____

Additional Comments:

Total Depth of Well (T.D.): 55 Screen Length: 5, (10), 15, 20 feet other:

Depth to Water (D.T.W): (1) 43.91 Well Diameter: (2), 4, 6, 8 inches other:

Field Parameters measured with: YSI / HANNA Casing Type: (PVC), Steel other:

Purge Rate: ~150 mL/min Sampling Device: Peristaltic, (Monsoon), Grundfos, Bailer, Other:

Tubing Type: (Polyethylene), Teflon, Other: Measuring Point: (TOC) other:

Pump Intake (~~ft below M.P.~~): 50 Color: ~~Brown~~ Turbid Odor: Yes, (No)

Time: (min) Stabalization Criteria[2]	Volume Purged (gallons)	DTW: (feet) (see note below)[3]	Temp (°C) +/- 3%	pH (std units) +/- 0.1 unit	SpC (uS/cm) +/- 3%	DO (mg/L) +/- 10%	ORP mV +/- 10 mV	Turb NTU +/- 10%[4]	Comments:
1710	0.5	43.96	18.39	7.59	253	8.11	-17.6	7999	
1715	1.0	44.08	18.47	7.63	244	6.91	-18.3	7999	
1720	1.5	44.16	18.96	7.77	237	5.32	-20.6	7999	
1725	2.0	44.23	18.77	7.93	237	5.21	-28.4	7999	
1730	2.5	44.25	18.60	8.07	239	5.20	-38.6	>999	
1735	3.0	44.26	18.60	8.09	242	5.19	-41.1	>999	
1740	3.5	44.27	18.54	8.12	243	5.16	-43.6	>999	
1745 – SAMPLE TIME									

Official Sampling Date & Time: 7-6-15 / 1745

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1	VOCs	HCl	14	GCAL

Notes:
(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.
(2) - Stabilization criteria based on three most recent consecutive measurements.
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft).
(4) +/- 10% when turbidity is over 10 NTUs.

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

e Name: Joslyn Clark Job #: 0253066

mple Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other) _____

mple ID: MW-12D

ate: 7-6-15

ampling Personnel: A. NEAL

/eather Conditions: (Sunny) Partly Cloudy, Cloudy, Rain; Other_____

ime: 1650

Well Type: Flush Surface Completion, (Stick Up Completion) Well Tag Present: (Yes,) No

Well Locked: (Yes,) No Lock Present: (Yes,) No Well ID Info. on Tag: (Yes,) No

Well Bolted: Yes, No Well Cap: (Yes) No Well Cap Condition: (Good,) Replace, Other:_____

Well Pad Condition: (Good,) Cracked, Replace, Other:_____ Well Location: Grass, Asphalt, Concrete, (Woods,) Other:_____

Additional Comments:

Total Depth of Well (T.D.): 110 Screen Length: 5, (10,) 15, 20 (feet) other:

Depth to Water (D.T.W): (1) 43.44 Well Diameter: (2,) 4, 6, 8 (Inches) other:

Field Parameters measured with: YSI / HANNA Casing Type: (PVC) Steel other:

Purge Rate: ~150 mL/min Sampling Device: Peristaltic, (Monsoon,) Grundfos, Bailer, Other:

Tubing Type: (Polyethylene,) Teflon, Other: Measuring Point: (TOC) other:

Pump Intake ~~(ft below M.P.)~~: 50 Color: Clear Odor: Yes, (No)

Time: (min)	Volume Purged	DTW: (feet)	Temp (°C)	pH (std units)	SpC (uS/cm)	DO (mg/L)	ORP mV	Turb NTU	
Stabalization Criteria[2]	(gallons)	(see note below)[3]	+/- 3%	+/- 0.1 unit	+/- 3%	+/- 10%	+/- 10 mV	+/- 10%[4]	Comments:
1620	0.5	43.45	18.30	7.56	143		66.7	22.6	
1625	1.0	43.52	18.14	7.50	134		65.6	16.7	
1630	1.5	43.51	18.22	7.46	132		68.8	14.4	
1635	2.0	43.50	18.24	7.39	129		74.2	9.42	
1640	2.5	43.50	18.27	7.38	127		76.8	7.12	
1650	SAMPLE TIME								

Official Sampling Date & Time: 7-6-15 / 1650

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
1	VOCs	HCl	14	GCAL

Notes:

(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.
(2) - Stabilization criteria based on three most recent consecutive measurements.
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft).
(4) +/- 10% when turbidity is over 10 NTUs.

WATER MATRIX SAMPLING

FIELD DATA FORM

ERM

Site Name: Joslyn Clark — Job #: 0253066

Sample Type: Circle one - (Monitor Well, DPT, Surface Water, Potable WSW; other) Observation Well

Sample ID: OW-1

Date: 7-8-15

Sampling Personnel: A. LEAL

Weather Conditions: (Sunny), Partly Cloudy, Cloudy, Rain; Other_____

Time: 835

Well Type: (Flush Surface Completion), Stick Up Completion — **Well Tag Present:** (Yes), No

Well Locked: (Yes), No — **Lock Present:** (Yes), No — **Well ID Info. on Tag:** (Yes), No

Well Bolted: (Yes), No — **Well Cap:** (Yes), No — **Well Cap Condition:** (Good), Replace, Other:_____

Well Pad Condition: (Good), Cracked, Replace, Other:_____ — **Well Location:** Grass, Asphalt, (Concrete), Woods, Other:_____

Additional Comments:

Total Depth of Well (T.D.): 60 — **Screen Length:** ? 5, 10, 15, 20 feet-other:

Depth to Water (D.T.W.): [1] 42.43 — **Well Diameter:** (2) 4, 6, 8 (inches)-other:

Field Parameters measured with: YSI / HANNA — **Casing Type:** (PVC), Steel other:

Purge Rate: ~150 mL/min — **Sampling Device:** Peristaltic, (Monsoon), Grundfos, Bailer, Other:

Tubing Type: (Polyethylene), Teflon, Other: — **Measuring Point:** (TOC) other:

Pump Intake (ft below M.P.): 61' — **Color:** Clear (ish) — **Odor:** Yes, (No)

Time: (min)	Volume Purged	DTW: (feet)	Temp (°C)	pH (std units)	SpC (uS/cm)	DO (mg/L)	ORP mV	Turb NTU	
Stabalization Criteria[2]	L ~~(gallons)~~	(see note below)[3]	+/- 3%	+/- 0.1 unit	+/- 3%	+/- 10%	+/- 10 mV	+/- 10%[4]	Comments:
805	0.5	43.97	21.55	5.94	87	6.17	-2.3	103	
810	1.0	44.04	21.57	5.88	87	5.81	-2.2	95.8	
815	1.5	44.33	21.76	5.99	87	5.36	-2.1	100	
820	2.0	44.62	21.88	6.16	85	5.21	-2.1	92.3	
825	2.5	44.85	21.80	6.39	82	5.16	-2.1	41.7	
830	3.0	45.12	21.71	6.44	81	5.11	-2.1	26.2	
835	3.5	45.30	21.68	6.45	78	5.06	-2.1	20.9	
835 —	SAMPLE TIME								

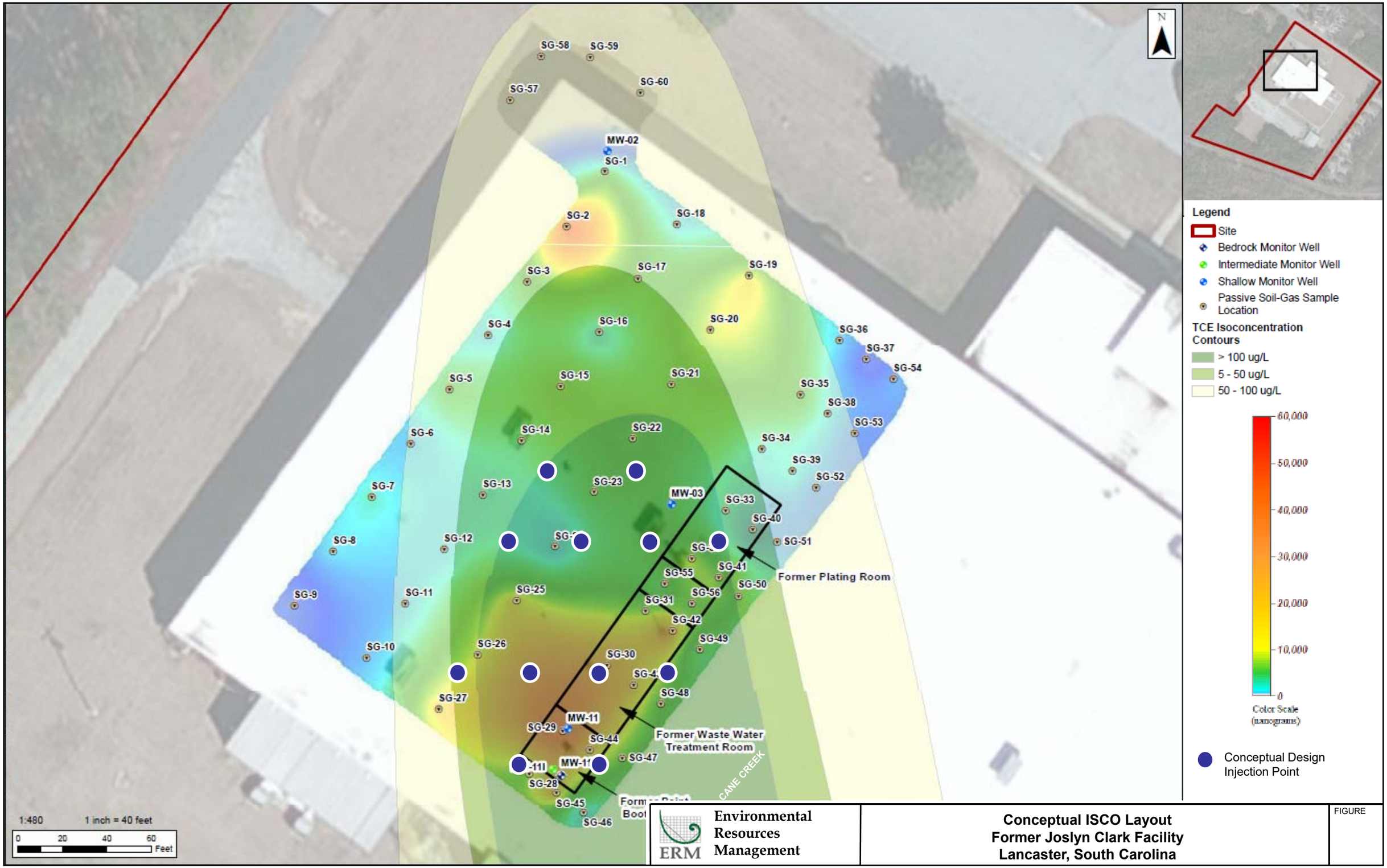
Official Sampling Date & Time: _____

Samples Collected:	Analysis Requested:	Preservative:	Hold Time (days):	Lab:
3	VOCs, Na, Cl, Mn	HCl HNO_3	14 ?	GCAL

Notes:

(1) - Do not measure depth to bottom of well until after purging and sampling to reduce resuspending fines that may be resting on the well bottom.
(2) - Stabilization criteria based on three most recent consecutive measurements.
(3) - Total drawdown in well to be less than 0.1 m (0.32 ft). Purging rate to be lowered as necessary to keep drawdown below 0.1 m (0.32 ft).
(4) +/- 10% when turbidity is over 10 NTUs.

APPENDIX B – REMEDIAL ALTERNATIVE ASSUMPTIONS AND COSTS



ERM Environmental Resources Management	**Conceptual ISCO Layout Former Joslyn Clark Facility Lancaster, South Carolina**	FIGURE

In-Situ Chemical Oxidation Injection

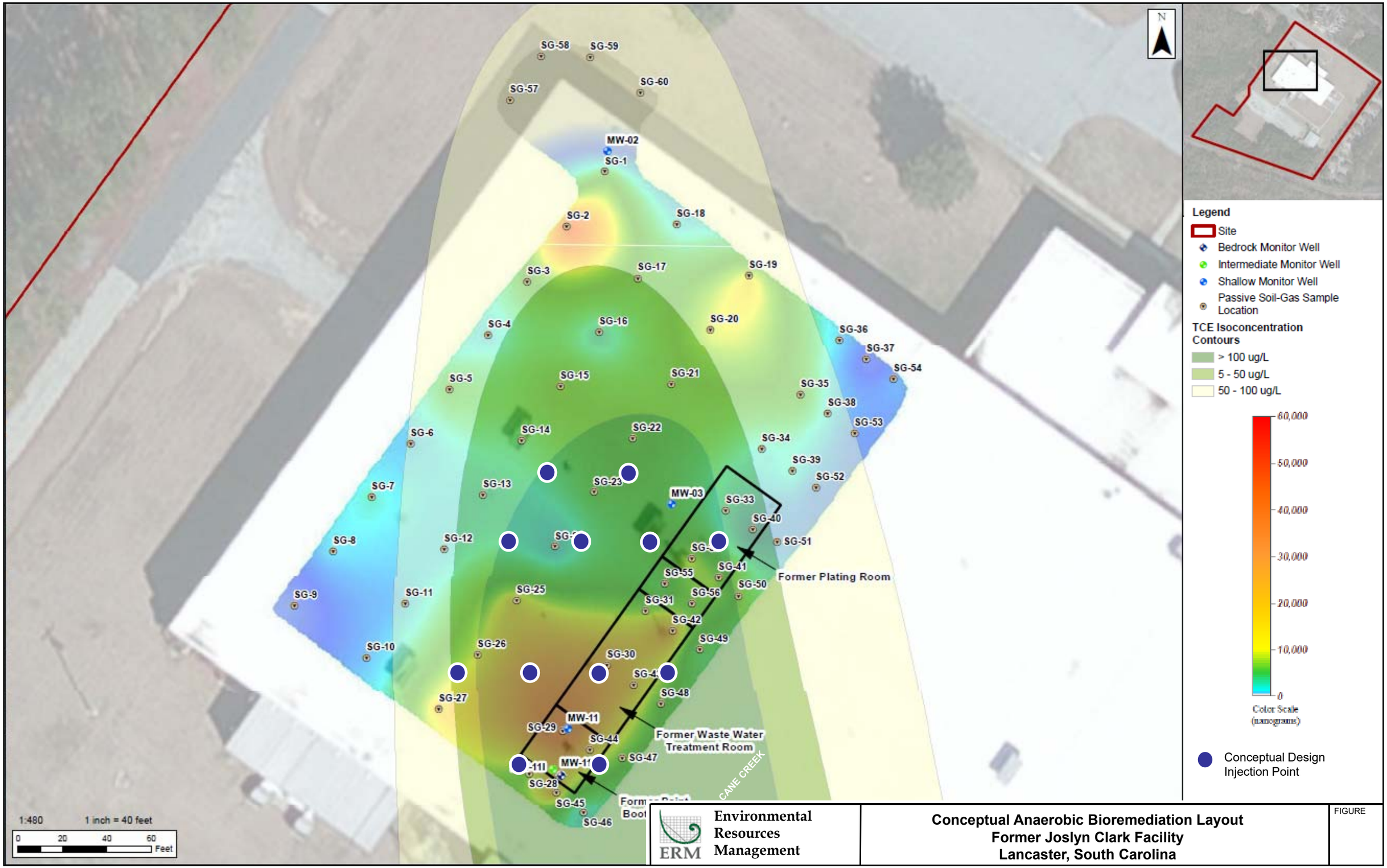
Treatment Area	22,500	sq ft	
Assumed ROI	15	ft	
Number of injection wells	12	wells	
Number of existing injection wells	0	wells	
Depth of Injection Wells	180	ft	Paired wells; 120 and 60 ft
Number of injections	5	events	
Injection Volume per well	2,000	gallons	
Oxidant Concentration	5	% wt/wt	

Description	Number of Units	Unit	Cost per Unit	Cost
Planning				
Pilot Test	0	lump sum	$ -	$ -
Reporting	0	lump sum	$ -	$ -
UIC Permit	0	lump sum	$ 10,000	$ -
Project Management			10%	$ -
Reporting			10%	$ -
Contingency			20%	$ -
Total				**$ -**

Well Installation				
Utility Locator	1	lump sum	$ 2,000	$ 2,000
Injection Well Installation	2,160	ft	$ 120	$ 259,200
Disposal as non-haz waste	94	tons	$ 200	$ 18,800
Injection Well Installation Labor	120	hours	$ 140	$ 16,800
Groundwater Sampling Equipment	1	week	$ 1,000	$ 800
Analytical	13	sample	$ 100	$ 1,320
Sampling Labor	40	hours	$ 100	$ 4,000
Expenses (per diem)	16	day	$ 150	$ 2,400
Project Management			10%	$ 30,500
Reporting			10%	$ 30,500
Contingency			20%	$ 73,300
Total				**$ 439,620**

Injection Event				
Injection Trailer	1	lump sum	$ 10,000	$ 10,000
Oxidant (permanganate)	12,000	lbs	$ 2.26	$ 27,060
Injection Labor	480	hours	$ 100	$ 48,000
Expenses (per diem)	48	day	$ 150	$ 7,200
Project Management			10%	$ 9,200
Reporting			10%	$ 9,200
Contingency			20%	$ 22,100
Total per Event				$ 132,760
TOTAL				**$ 663,800**

TOTAL **$ 1,100,000**



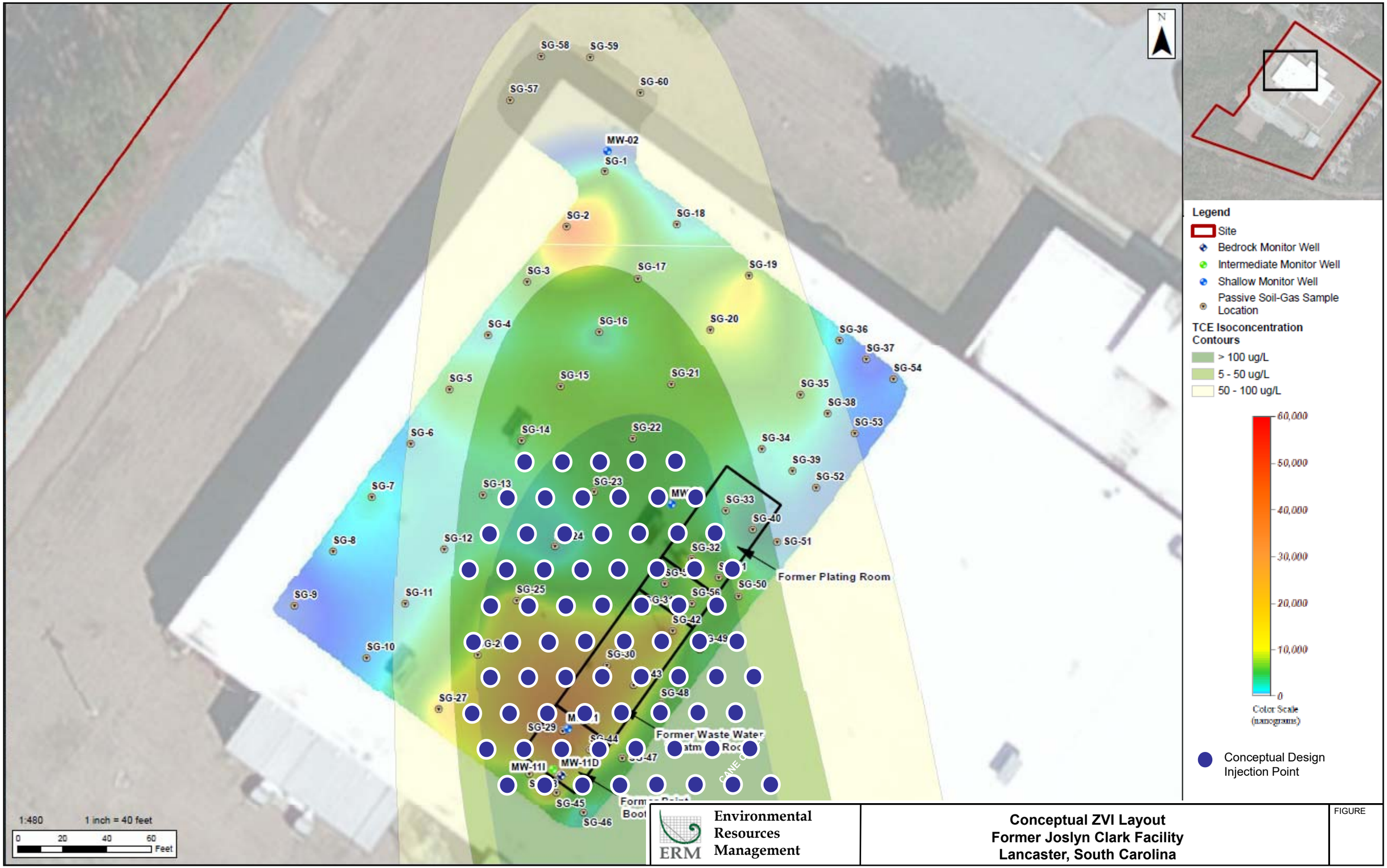
ERM Environmental Resources Management	**Conceptual Anaerobic Bioremediation Layout Former Joslyn Clark Facility Lancaster, South Carolina**	FIGURE

Anaerobic Bioremediation

Treatment Area	22,500	sq ft	
Assumed ROI	15	ft	
Number of injection wells	12	wells	
Number of existing injection wells	0	wells	
Depth of Injection Wells	180	ft	Paired wells; 120 and 60 ft
Number of injections	6	events	
Injection Volume per well	2,000	gallons	
Carbon Concentration	20	% wt/wt	

Description	Number of Units	Unit	Cost per Unit	Cost
Planning				
Pilot Test	1	lump sum	$ 90,000	$ 90,000
Reporting	1	lump sum	$ 20,000	$ 20,000
UIC Permit	1	lump sum	$ 10,000	$ 10,000
Project Management			10%	$ 12,000
Reporting			10%	$ 12,000
Contingency			20%	$ 28,800
Total				**$ 172,800**
Well Installation				
Utility Locator	1	lump sum	$ 1,000	$ 1,000
Injection Well Installation	2,160	ft	$ 120	$ 259,200
Disposal as non-haz waste	94	tons	$ 160	$ 15,100
Injection Well Installation Labor	120	hours	$ 140	$ 16,800
Groundwater Sampling Equipment	1	week	$ 1,000	$ 800
Analytical	13	sample	$ 100	$ 1,320
Sampling Labor	40	hours	$ 100	$ 4,000
Expenses (per diem)	16	day	$ 150	$ 2,400
Project Management			10%	$ 30,100
Reporting			10%	$ 30,100
Contingency			20%	$ 72,200
Total				**$ 433,020**
Injection Event				
Injection Trailer	1	lump sum	$ 10,000	$ 10,000
Carbon	48,000	lbs	$ 1.32	$ 63,360
Bacterial	12	1 L per point	$ 132	$ 1,600
Injection Labor	480	hours	$ 100	$ 48,000
Expenses (per diem)	48	day	$ 150	$ 7,200
Project Management			10%	$ 13,000
Reporting			10%	$ 13,000
Contingency			20%	$ 31,200
Total per Event				$ 187,360
TOTAL				**$ 1,124,160**

TOTAL **$ 1,700,000**



ERM Environmental Resources Management	**Conceptual ZVI Layout** **Former Joslyn Clark Facility** **Lancaster, South Carolina**	FIGURE

Zero Valent Iron (ZVI)

			ZVI Loading Calculation	
Treatment Area	22,500	sq ft	Volume (cf soil)	2,025,000
Assumed ROI	7	ft	cu yds	75,000
Number of injection wells	73	wells	tons	105,000
Number of existing injection wells	0	wells	soil density (#/cf)	100
Depth of Injection Wells	180	ft	lbs of soil	202,500,000
Injection Volume per well	2,000	gallons	Blending Rate (% ZVI)	1%
Carbon Concentration	20	% wt/wt	lbs of ZVI	2,025,000

Description	Number of Units	Unit	Cost per Unit	Cost
Planning				
Pilot Test	1	lump sum	$ 90,000	$ 90,000
Reporting	1	lump sum	$ 20,000	$ 20,000
UIC Permit	1	lump sum	$ 10,000	$ 10,000
Project Management			10%	$ 12,000
Reporting			10%	$ 12,000
Contingency			20%	$ 28,800
Total				**$ 172,800**

Injection Event				
Utility Locator	1	lump sum	$ 2,000	$ 2,000
Injection Well Installation	13,161	ft	$ 120	$ 1,579,358
Injection Well Labor	731	hours	$ 140	$ 102,400
ZVI	2,025,000	lbs	$ 1.25	$ 2,531,250
Expenses (per diem)	73	day	$ 150	$ 11,000
Project Management			10%	$ 422,600
Reporting			10%	$ 422,600
Contingency			20%	$ 1,014,200
Total				**$ 6,085,408**

TOTAL **$ 6,300,000**

Environmental Resources Management

Conceptual Hydraulic Containment System Layout
Former Joslyn Clark Facility
Lancaster, South Carolina

FIGURE

Hydraulic Containment

Design Assumptions:

Length of Wall	500	ft
Well Spacing	100	ft
Nested wells at each location	1	
Number of wells	6	wells
Depth of wells	70	ft
Length of Trench	2000	ft
Flow rate per well	4	gpm
Total System Flow	24	gpm

Description	Unit	Number of Units	Cost per Unit	Cost
Aquifer Pumping Test (48-hr)				
Work Plan (internal)	allowance	1	$ 3,000	$ 3,000
HASP	allowance	1	$ 3,000	$ 3,000
Subsurface Clearance	allowance	1	$ 1,500	$ 1,500
Well Installation	each	3	$ 5,000	$ 15,000
Surveyor	allowance	1	$ 2,000	$ 2,000
Pump Rental	allowance	1	$ 500	$ 500
Electrical Generator Rental	allowance	1	$ 500	$ 500
Frac Tank Rental	month	1	$ 1,000	$ 1,000
Pressure Tranducer Rental (4)	week	1	$ 2,000	$ 2,000
Piping, Flow Meters, Gauges	allowance	1	$ 1,000	$ 1,000
Groundwater Analytical	samples	5	$ 500	$ 2,500
ERM Labor - Well Installation	hours	16	$ 100	$ 1,600
ERM Labor - Pumping Test	hours	80	$ 100	$ 8,000
ERM Travel Expenses	days	8	$ 300	$ 2,400
ERM PPE	days	8	$ 25	$ 200
Aquifer Pumping Test Evaluation and Report	allowance	1	$ 15,000	$ 15,000
Subtotal				**$ 59,200**
Design, Permitting & Bidding				
Groundwater Modelling	allowance	1	$ 20,000	$ 20,000
Design Drawings & Specifications	allowance	1	$ 40,000	$ 40,000
Vendor & Contractor Bid Package	allowance	1	$ 15,000	$ 15,000
Bid Evaluation and Selection	allowance	1	$ 5,000	$ 5,000
Regulatory Reporting	allowance	1	$ 20,000	$ 20,000
Subtotal				**$ 100,000**

Construction and Startup						
HASP	allowance	1	$	3,000	$	3,000
Subsurface Clearance	allowance	1	$	3,000	$	3,000
Well Installation	ft	420	$	110	$	46,200
Electrical Submersible Pumps & Controls	each	6	$	5,200	$	31,200
Wellhead Components (gauge, valve, meter, uni-strut, etc.)	each	6	$	500	$	3,000
Trenching	feet	2,000	$	35	$	70,000
System Building	allowance	0	$	25,000	$	-
Groundwater Treat System (bag filters, EQ tank, air stripper)	allowance	1	$	125,000	$	125,000
Power Drop	allowance	1	$	50,000	$	50,000
Electrical Contractor	allowance	1	$	50,000	$	50,000
Civil/Mechanical Contractor	allowance	1	$	50,000	$	50,000
Surveyor	days	1	$	2,000	$	2,000
Drill cuttings, purge water, and drilling mud T&D	ton	18	$	30	$	554
ERM Labor - Well Installation	hours	168	$	100	$	16,800
ERM Labor - Construction	hours	300	$	125	$	37,500
ERM Labor - Startup	hours	100	$	100	$	10,000
ERM Travel Expenses	days	57	$	300	$	17,040
ERM PPE	days	57	$	25	$	1,420
Subtotal					**$**	**516,700**
TOTAL CAPITAL COSTS						
Reporting				10%	$	51,670
Contingency				10%	$	51,670
Total					**$**	**779,240**

Annual Operation and Maintenance						
Electricity	month	12	$	3,000	$	36,000
Supplies (bag filters, etc.)	month	12	$	2,500	$	30,000
Waste Disposal	month	12	$	1,000	$	12,000
ERM Labor - O&M	hours	240	$	100	$	24,000
ERM Travel Expenses	days	24	$	300	$	7,200
ERM PPE	days	24	$	25	$	600
Reporting				10%	$	11,000
Contingency				20%	$	24,200
Total					**$**	**145,000**

TOTAL O&M			
System Operation (years)			10
Total		**$**	**1,450,000**

TOTAL **$ 2,200,000**

Monitored Natural Attenuation

Number of monitoring wells	16	
Sampling frequency	1	per year
Number of years	20	years
Wells per day	3	

Description	Number of Units	Unit	Cost per Unit	Cost
Labor	53	hours	$ 100	$ 5,300
Equipment Rental	1	week	$ 1,000	$ 1,100
Laboratory Charges	20	sample	$ 100	$ 2,000
Expenses (per diem)	5	day	$ 150	$ 800
Project Management			10%	$ 900
Reporting			20%	$ 7,000
Contingency			20%	$ 3,400
RBCA Closure with Deed Recordation and Well Abandonment	1	Unit	$ 80,000	$ 80,000
Total:				
per event				**$ 20,500**
per year				**$ 20,500**
Total				**$ 490,000**

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