From: Terefe Mazengia <Terefe.Mazengia@ghd.com>
Sent: Friday, March 18, 2022 11:10 AM
To: Devlin, Cynde <devlincl@dhec.sc.gov>
Cc: Martin L. Doster, P.E. <mdoster@lippes.com>; Steve Wilsey <Steven.Wilsey@ghd.com>; Terefe Mazengia <Terefe.Mazengia@ghd.com>
Subject: Former Bluewater Thermal Site Revised Focused Feasibility Study Report (Rev 2)_11225667

Hi Cynde,

Please find attached the final copy of the Focused Feasibility Study (FS) Report (Second Revision) for the former Bluewater Thermal Solution's Site in Fountain Inn, SC. Included is also a cover letter which summarizes the work performed at the Site and the selected remedial alternative (Alternative #3 (ISCO)) amongst the alternatives provided in the FS Report.

As per the VCC contract, two hard copies and one CD of the report are being mailed out to you for Tuesday delivery.

Please let me know if you have any questions.
Thank you

TEREFE MAZENGIA, PG
PROFESSIONAL GEOLOGIST – GA, FL AND SC
Project Manager/Senior Geologist - Environment

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GHD ref: 11225677Devlin3

March 16, 2022

Ms. Cynde Devlin
South Carolina Department of Health and Environmental Control
State Voluntary Cleanup Section
2600 Bull Street
Columbia, South Carolina 29201

RECEIVED
MAR 23 2022
SITE ASSESSMENT, REMEDIATION, & REVITALIZATION

Revised Focused Feasibility Study Report
Bluewater Thermal Solutions LLC
VCC #14-6226
Fountain Inn, South Carolina

Dear Ms. Devlin:

GHD on behalf of Gibraltar Industries Inc. (Gibraltar), hereby submits to the South Carolina Department of Health and Environmental Control (SCDHEC) this Revised Focused Feasibility Study (FS) Report for the former Bluewater Thermal Solutions facility, located at 100 Hunts Bridge Road in Fountain Inn, South Carolina (Property or Site), based upon the requirement of the State of South Carolina Voluntary Cleanup Program (VCP).

The report has been updated in response to comments received on February 19, 2021 and follow up discussions with SCDHEC. During the meeting SCDHEC stated that additional information was needed including the pilot study data, boring logs, additional round of groundwater data and indoor air sampling. We are pleased to submit this information to you in the form of a FS Report.

The purpose of this Revised Focused FS Report is to develop and evaluate alternatives for remedial action to prevent, mitigate or otherwise respond to the migration or release of contaminants from the Site. The FS has been developed based on information gathered through various investigations and studies conducted pursuant to the VCC conducted by the responsible party. Data used to develop this FS was submitted to the SCDHEC in various submittals including, but not limited to, the following documents.

- Phase II Environmental Site Assessment Report – dated September 2012, by ARCADIS
- Focused Phase II Environmental Site Assessment – dated December 2013, by CRA (GHD);
- Remedial Site Investigation Work Plan – dated August 2016, by GHD;
- Soil and Groundwater Delineation Report – dated February 2017, by GHD;
- Revised Site Investigation Work Plan – dated July 2017, by GHD;
- Groundwater Delineation and Soil Gas Investigation Report - dated June 2018, by GHD;
- Bench Scale Study Report - dated October 2018 by GHD

Volatile organic compounds (VOCs) are present in groundwater at the former Bluewater Thermal Solutions Site. A remedial site investigation was conducted to assess and delineate the soil and groundwater impact at the Site. A bench scale testing was performed to determine the effectiveness, optimal oxidant and dosage for an in situ chemical oxidation (ISCO) treatment of the impacted groundwater. Treatment of the

(37)

chlorinated volatile organic compounds (CVOC) impacted groundwater was conducted based on the results of the bench scale testing.

Results of the bench scale testing showed that ISCO was an effective treatment for reducing the concentrations of PCE and its daughter products in the groundwater. Base (NaOH) catalyzed sodium persulfate was the recommended oxidant as it was found to be effective for all CVOC present in the groundwater during the treatability study. Accordingly, the results post the Pilot ISCO injection show a significant PCE and TCE reduction in groundwater, ranging from 90 to 98% reductions. Concentrations of VOCs in the furthest downgradient monitoring well MW-6-16 have held steady throughout before and after the pilot injection showing that the groundwater plume is very stable and contained on -site in a small area at the southwest part of the Site.

Based on our recent discussion with SCDHEC, access to Buildings 5 and 6 was granted for indoor air sampling. The indoor air sampling investigation and results are provided as Appendix A of the FS Report.

Based on an evaluation of remedial technologies, the bench scale study and the pilot ISCO injection already conducted at the Site will meet the remedial goals in an expeditious time frame.

Attached are two hard copies and one electronic copy (compact disk) of the report.

Please contact the undersigned and copy Mr. Richard Scherer with Lippes Mathias Wexler Friedman LLP (716.853.5100 or rscherer@lippes.com) if you have comments or questions on the report.

On behalf of Gibraltar Industries, we look forward to working with you to finalize this document in accordance with the VCP.

Regards,

Terefe Mazengia, PG

678-280-2140
terefe.mazengia@ghd.com

TM/da/3

Enclosures

copy: Richard Scherer, Lippes Mathis Wexler Friedman, LLP
Martin Doster, Lippes Mathis Wexler Friedman, LLP
Steven Wilsey, GHD

305608

Email Scanned PM Copy

Revised Focused Feasibility Study Report (Revision 2)

Former Bluewater Thermal Solutions
100 Hunts Bridge Road
Fountain Inn, South Carolina

Voluntary Cleanup Contract #14-6226-RP

Gibraltar Industries, Inc.

March 16, 2022

→ The Power of Commitment

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Appendices

1. Introduction

1.1 General

GHD on behalf of Gibraltar Industries Inc. (Gibraltar), hereby submits to the South Carolina Department of Health and Environmental Control (SCDHEC) this Revised Focused Feasibility Study (FS) Report for the former Bluewater Thermal Solutions facility, located at 100 Hunts Bridge Road in Fountain Inn, South Carolina (Property or Site), based upon the requirement of the State of South Carolina Voluntary Cleanup Program (VCP). This report was revised based on SCDHEC comments dated February 19, 2021 on the Focused Feasibility Study Report (July 2020).

The purpose of this Revised FS Report is to develop and evaluate alternatives for remedial action to prevent, mitigate or otherwise respond to the migration or release of contaminants from the Site. The Revised FS has been developed based on information gathered through various investigations and studies conducted pursuant to the VCC conducted by the responsible party. Data used to develop this FS was submitted to the SCDHEC in various submittals including, but not limited to, the following documents.

- Phase II Environmental Site Assessment Report – dated September 2012, by ARCADIS
- Focused Phase II Environmental Site Assessment – dated December 2013, by CRA (GHD);
- Remedial Site Investigation Work Plan – dated August 2016, by GHD;
- Soil and Groundwater Delineation Report – dated February 2017, by GHD;
- Revised Site Investigation Work Plan – dated July 2017, by GHD;
- Groundwater Delineation and Soil Gas Investigation Report - dated June 2018, by GHD;
- Bench Scale Study Report - dated October 2018 by GHD

Volatile organic compounds (VOCs) are present in groundwater at the former Bluewater Thermal Solutions Site. A remedial site investigation was conducted to assess and delineate the soil and groundwater impact at the Site. A bench scale testing was performed to determine the effectiveness, optimal oxidant and dosage for a pilot in situ chemical oxidation (ISCO) treatment of the impacted groundwater. A pilot scale treatment of the chlorinated volatile organic compounds (CVOC) impacted groundwater was conducted based on the results of the bench scale testing.

1.2 Report Organization

The remaining sections of the report are organized as follows:

Section 2.0 Background: presents the site description, geology and hydrogeology;

Section 3.0 Previous Site investigations: presents soil, groundwater and soil vapor results;

Section 4.0 Pilot Injection: presents summary of the pilot scale injection and performance groundwater results post injection;

Section 5.0 Remedial Action Objectives: describes objectives of the remedial plan;

Section 6.0 Remedial Technologies: presents alternative groundwater treatment options;

Section 7.0 Remedial Alternatives Evaluation: describes the remedial alternatives to address the groundwater impact;

Section 8.0 Comparative Analysis of Alternatives: presents comparative evaluation of alternatives; and

Section 9.0 Certification

2. Background

2.1 Site Description

The Site is located in the City of Fountain Inn in Laurens County. The facility property is located off of Interstate 385 and lies to the south of State Road S-30-731, approximately 2.0 miles southeast of the center of Fountain Inn in a commercial and agricultural area. The location of the Site is shown on Figure 2.1. A Site Plan/Monitoring Well Location map is provided on Figure 2.2.

The Property is zoned as commercial/industrial, with the Property owned by Bodycotes and is utilized for industrial (heat treating and thermal processing) purpose. The Property is bounded to the west and southwest by Interstate 385, to the north by commercial facility (bakery), to the south and southeast by dense wooded area and to the east by a farmland.

2.2 Site History

Based on historical information, the Site consisted of agricultural land prior to development of the current improvements in 1968 and 1989, which consist of a one-story structure totaling 74,500 square feet. The Site has been occupied by a heat-treating facility since construction. The property was sold to Blacksmith Leasing in January 1984 by Harold Hendershot, Jr., et al. The property was purchased by Carolina Commercial Heat Treating (CCHT) in March 1999 from Blacksmith Leasing. Bluewater Thermal Solutions (Bluewater) occupied the Site since 2008 until it was sold to Bodycote Thermal Processing Inc. (Bodycote) in 2013. Bodycote is the current owner of the Site. Bodycote is a heat-treating company that uses the Site to alter the properties of metal products through hardening, brazing, annealing and passivating.

2.3 Conceptual Site Model

A Conceptual Site Model (CSM) was developed for the site using historical investigation data and recent data collected from the Site. A summary of these results, including historical data, are presented in Section 3.0 below to provide a collective understanding of the geologic and hydrogeologic framework and the processes that control the fate and transport of the contaminants within the hydrostratigraphic framework. Additional information pertaining to the historical soil and groundwater data was included in the Focused Phase II Environmental Site Assessment (ESA) Report (CRA 2013) and the Soil and Groundwater Delineation Report (GHD 2017).

2.3.1 Geology and Hydrogeology

The Property is located in the Laurens Trust Stack which is part of the Piedmont Province. The geology of this province comprises of mostly saprolite (highly weathered rock) to 35 to 40 feet below grade (ft bg) before transitioning to weathered bedrock. The piedmont is comprised of crystalline metamorphic rocks with the most abundant rock types including gneiss, schist and metamorphosed granitic rocks.

Hydrogeology of the Piedmont hydrogeological province is summarized by LeGrand (LeGrand 1954, 1967, 2004) and Heath (Heath 1984, 1988). The generalized groundwater system in the Piedmont is a two-part aquifer system. The unconsolidated saprolite composes the surficial aquifer which overlies the bedrock aquifer. The saprolite aquifer serves as the principal storage reservoir for the bedrock aquifer.

2.3.2 Site Geology and Hydrogeology

The Site geology consists of residual clay/silt soils to a depth of 10 to 15 ft bg where saprolite was encountered. The saprolite is mostly weathered granitic-gneiss with thick bands of feldspar. Quartz veins were observed sporadically within the saprolite unit. The fine-grained nature of the saprolite suggests the water bearing unit will have a lower permeability at shallower intervals with an increase in permeability with greater depth as the grain size transitions from clay and silt to sandier soils

Hydrogeology of the Site is comprised of an unconfined surficial aquifer (10 to 45 feet thick) consisting of silty sands underlain by the saprolite unit. The depth to groundwater in the surficial aquifer ranges from 18 to 22 ft bg.

The vertical hydraulic gradient between the surficial aquifer and the deep saprolite aquifer is downward in the central portion of the Property. Groundwater generally flow to the southeast with an average hydraulic gradient of 0.01.

The vertical variability in saprolite permeability values results in decreased hydraulic interaction between the shallower and the underlying saprolite layers. The result is a contaminant transport tendency that involves the lower-permeability saprolite materials serving as shallow mass storage.

2.3.3 Groundwater Flow

The groundwater flow system of the Piedmont has been widely studied and, in general, provides a good framework for CSM development. Review of the available historical data in the context of typical Piedmont conditions has allowed refinement of the CSM and an improvement in the hydrogeologic framework that controls contaminant transport at the site. In general, the hydrogeology at the site conforms to the LeGrand model.

Groundwater flow at the site mimics surface water drainage. The topographic high for the Site is towards Hunts Bridge Road and at Building 6. Groundwater flow, similar to topography, slopes away from Building 6 toward the southeast to the wooded area. This flow condition is evident in the groundwater potentiometric surface data collected at the site. Figure 2.3 presents the groundwater elevation map for the surficial unit and the shallow saprolite. Figure 2.4 shows cross section locations representing the Site. Representative Site geological cross-sections along with the most recent (April 2020) groundwater elevations and analytical results are provided on Figures 2.5 and 2.6.

2.3.4 Concentrations in Groundwater

The groundwater concentrations post the Pilot ISCO injection showed a significant PCE and TCE reduction, especially at MW-1S-16 and MW-5S-16. Groundwater concentrations in monitoring wells TW-10 and TW-11 showed PCE and TCE concentrations during the recent (April 2020) sampling event. The temporary increase in concentrations of PCE and TCE in the two wells could be due to redistribution of impacted groundwater during the pilot injection. Concentrations of VOCs in the furthest downgradient monitoring well MW-6-16 have held steady throughout before and after the pilot injection showing that the groundwater plume is very stable and contained in a small area at the southwest part of the Site. Isoconcentration maps of PCE and TCE in groundwater at the Site using the most recent (April 2020) monitoring event are provided on Figure 2.7 and 2.8, respectively.

3. Previous Site Investigations

GHD conducted Focused Phase II ESA activities during November 2013 that included installation of eight soil borings which were also converted to temporary wells for groundwater monitoring. Soil and groundwater samples were collected during these due diligence activities and analyzed for target compound list (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), total analyte list (TAL) metals and the ten most prevalent tentatively identified compounds (TICs).

3.1 Soil Samples

Surface and subsurface soil samples have been collected using direct push technology (DPT) at numerous locations throughout the Site to define the extent of impact (if any) and volume soil requiring remedial action. Details on the soil sampling including sample depth intervals, applicable screening of the soils and laboratory analytical results of the soil samples were presented in the Focused Phase II ESA (December 2013) and Soil and Groundwater Delineation report (February 2017) (concurrence comment letter on May 26, 2017). Summary of the soil data are presented as Table 3.1. Figure 3.1 provides soil sample locations and associated analytical data.

No TCL VOCs and TCL SVOCs were detected in any of the soil samples above the laboratory reporting limits except acetone which was detected in the shallow intervals (less than 2 feet) at B-1, B-2, B-3, B-4, B-5, B-9 and B-10 above the reporting limit but more than five orders of magnitude below the industrial soils screening criteria. As there is no evidence of other impact in this zone, the acetone detection may be attributed to laboratory artifact.

Tetrachloroethylene (PCE) was detected at 30 micrograms per kilograms (µg/kg), below the screening criteria in the sample collected from B-1 between 15 and 15.5 ft bg. The low PCE concentration might be attributed to the groundwater because the sample was collected from the capillary fringe immediately above the water table.

Select TAL metals were detected at various locations and intervals below the Industrial soils screening criteria except thallium which slightly exceeded the Industrial soils screening criteria of 1200 µg/kg at B-2 (2370 µg/kg) from interval 14 to 15 feet bg.

3.2 Groundwater Samples

3.2.1 Overburden Groundwater

On-Site groundwater sampling has delineated one area of groundwater impact from historic operations where the primary impacts are chlorinated VOCs. Further details on the well installations, groundwater sampling including applicable screening (field and laboratory) of the groundwater and laboratory analytical results of the groundwater samples are provided in the Focused Phase II ESA and the Soil and Groundwater Delineation report. Summary of the groundwater analytical results are presented as Table 3.2. Figure 3.2 provides groundwater monitoring well locations.

Highest concentrations of PCE and TCE were detected at MW-1S-16 above the maximum contaminant levels (MCLs). PCE was also detected at side-gradient well MW-5-16 above the MCL. Select VOC compounds (PCE, TCE, 1,1-dichloroethane (1,1-DCA), and 1,1-dichloroethene (1,1 DCE)) were also detected slightly above their respective MCLs in select groundwater samples (MW-1S-16, MW-5-16 and MW-6-16). Overall, the possible source area focuses around wells MW-1S-16 and slightly upgradient of the two monitoring wells. The November 2013 Phase II site investigation has also identified the same area (BH-4 and BH-5) with the highest concentration of PCE and TCE. In addition, groundwater samples from three locations (BH-6, BH-7 and BH-8) located inside Building 6 exceeded the MCLs for PCE and TCE. The source for these compounds was not identified.

No TCL SVOCs were detected in groundwater above the screening criteria (MCL or Tapwater). All TAL metals were reported below their respective screening criteria except antimony and selenium at MW-1D-16, manganese at MW-1S-16 and MW-3-16 which were detected above their respective MCLs. No apparent source for these metals has been identified at the Site and monitoring has indicated that elevated metals concentrations in groundwater are indicative of natural sources.

3.2.2 Deep Saprolite Groundwater

Based on the results of previous groundwater sampling, including the results of the monitoring well installed in the deeper saprolite unit, no VOCs impact is present in deeper saprolite groundwater and no evidence of the vertical migration of impact has been observed likely due to the low vertical hydraulic conductivity of the saprolite unit.

3.3 Vapor Intrusion Assessment

3.3.1 Soil Vapor

Four soil gas sample points (SG-1 through SG-4) were installed around the buildings on January 2, 2018 (approved by letter on August 25, 2017) and were sampled on January 4. SG-1 and SG-2 are located south of Building 6 and 5, respectively. SG-3 is located west of Building 2 and SG-4 is located west/southwest of Building 3. All points were installed within 10 feet of the buildings except SG-4, which is located approximately 20 feet away from Building 3 due to underground utility and topography of the area. Locations of the soil vapor sample points and associated analytical data are shown on Figure 3.3.

The soil vapor results are summarized in Table 3.3 and compared to the Target Sub-Slab and Exterior Soil Gas Concentrations (target sub-slab concentrations) for soil gas under a commercial exposure scenario which were calculated using the United States Environmental Protection Agency (USEPA) Vapor Intrusion Screening Level (VISL) calculator version 3.5, June 2017 Regional Screening Levels (RSLs). Target risk for carcinogens of 10-5, an attenuation factor (AF) of 0.03 and a target hazard index of 1.0 for non-carcinogens were used to calculate the

target sub-slab concentrations. The target sub-slab concentrations were calculated for compounds that were detected in one or more of the soil gas samples.

Results of the screening data show that soil gas concentrations in the vadose zone are all below the calculated screening levels for a commercial exposure scenario with only one exception. PCE exceeded the screening criteria of 5,800 µg/m3 at SG-2 where a soil gas concentration of 9,200 µg/m3 was detected.

Sub slab soil gas sampling was proposed inside Buildings 5 and 6 in 2018 but all previous attempts to install and sample sub slab soil gas inside the buildings was not successful because access was denied by the current property owner, Bodycote. A request to Bodycote for access was made on April 7, 2021 and access was granted for indoor air sampling in Buildings 5 and 6 on April 9, 201. As discussed in previous communications, Bluewater Thermal Solutions no longer owns or occupies the facility.

3.3.2 Indoor Air Sampling

Indoor air quality investigation was conducted at the facility in Buildings 5 and 6 on April 30, 2021. The primary objective of this investigation was to confirm indoor air quality within the on-Site buildings, and to determine if soil vapors associated with soil and groundwater impacts were contributing to indoor air quality. Soil and groundwater impacted with volatile organic compounds (VOCs) is present on Site. The impacts are considered to be associated with historical Site operations conducted by others on the Site in the past.

As discussed with DHEC, ambient indoor air samples were collected at six ambient indoor air sample locations, one duplicate, one ambient outdoor air, and one trip blank and submitted for laboratory analysis of select VOCs (tetrachloroethene (PCE) and trichloroethene (TCE)). Indoor and outdoor air samples (including a duplicate) were collected over an 8-hour period at a height of approximately 5 feet above ground at the six locations located within Buildings 5 and 6 and at the ambient outdoor sample location. The air samples were collected using laboratory supplied 6-litre Summa canisters.

The results of the indoor and outdoor ambient air samples are compared to the USEPA indoor air RSLs for a composite worker (USEPA, 2021[1]). These toxicity-based screening levels are non-site specific risk-based concentrations for indoor air that are considered to be protective of humans, including sensitive groups, over a lifetime. Indoor air RSLs are based on a target cancer risk of 1×10^{-6} and a target hazard quotient (HQ) of 1.

Concentrations of ambient indoor or outdoor air samples from within Buildings 5 and 6 were below the USEPA composite worker indoor air RSL. Based on these sampling results, indoor air quality is not impacted due to the soil and groundwater concentrations of PCE and TCE at the Site. Based on the results and corresponding risk assessment, no exposure pathways were identified in the buildings and mitigation is not warranted.

The facility is currently used for manufacturing purposes. Based on discussions with the facility, there no immediate plan to change the facility use.

Details on the sampling procedures, field data sheets, analytical results summary and laboratory report are included in the Indoor Air Quality Investigation report provided in Appendix A.

3.4 Impacted Media

Investigation activities completed to date have identified a potential source area to groundwater and delineated the migration of the contaminants in the groundwater flow system. Based on the data available, impacted media at the Site includes on-site groundwater where the concentrations of site COCs are present above the applicable regulatory standards.

[1] USEPA, 2021. Regional Screening Levels (RSLs), May. Regional Screening Levels (RSLs) - Generic Tables | Risk Assessment | US EPA.

4. Pilot Scale Injection

Remediation using in-situ chemical oxidation (ISCO) injection was implemented in January 2019 as proposed in the October 2018 Bench Scale Study Report and approved by SCDHEC in a letter dated November 16, 2018. The injection consisted of one application of the oxidant to the CVOC plume area south/southeast of Buildings 5 and 6 and west of Buildings 2 and 3. The injection locations are provided on Figure 4.1.

The treatment area included approximately 13,500 square feet between MW-5-16 and BH-3 in the north and between TW-10 and TW-11 in the south. A 20-foot radius of influence (ROI) in the saprolite material was expected; therefore, 14 (DPT) injection locations were implemented. Injections were made at 20 and 28 feet depths below ground surface using temporary injection points using a direct push technology drilling rig.

Groundwater performance monitoring was conducted at monitoring wells MW-1S-16, MW-5-16, MW-6-16, TW-10 and TW-11 to assess improvement of groundwater after injection of the oxidants. Base line groundwater sampling was conducted at TW-10 and TW-11 in January 2019 before the injection. Groundwater concentrations from January 2018 were used as baseline concentrations for monitoring wells MW-1S-16, MW-5-16 and MW-6-16. Post injection groundwater monitoring was conducted in April and July 2019 and April 2020, 3-months 6-months and 15-months following completion of the injection.

The groundwater concentrations post the ISCO remediation showed a significant PCE and TCE reduction, especially at MW-1S-16 and MW-5S-16. At the source area, PCE was reduced from a high of 4,100 µg/L to 180 µg/L and TCE was reduced from 110 µg/L to 1.7 µg/L. At downgradient wells TW-10 and TW-11, PCE and TCE concentrations decreased by over 65 percent by July 2019 (six months post injection) from their high in April 2019. At TW-10 and TW-11, PCE concentrations increased from 4.7 µg/L to 740 µg/L and TCE concentrations increased from non-detect to 20 µg/L. Temporary increase in concentrations of PCE and TCE in TW-10 and TW-11 in April 2020 are likely attributable to redistribution of impacted groundwater during the pilot injection. Concentrations of VOCs in the furthest downgradient monitoring well MW-6-16 have held steady throughout the monitoring period indicating the groundwater plume is stable and contained in a smaller area at the southwest part of the Site. The ISCO remediation has significantly reduced the groundwater concentrations particularly at the center of the plume.

The complete Pilot Scale ISCO Injection Report is provided in Appendix B.

5. Remedial Action Objectives

The USEPA guidance document entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (USEPA, October 1988) states,*" Remedial Action Objectives (RAOs) consist of medium-specific or operable-unit specific goals for protecting human health and the environment. The objectives should be as specific as possible but not so specific that the range of alternatives that can be developed is unduly limited.*

RAOs are Site-specific clean-up objectives established for protecting human health and the environment. RAOs specify contaminants and media of concern, potential exposure pathways and receptors, and remediation goals (RGs) [40 CFR 300.430 (e)(2)(i)]. RAOs indicate a contaminant level and an exposure route, rather than a contaminant level alone, because protection of human and ecological receptors may be achieved by reducing or eliminating exposure pathways as well as by reducing contaminant concentrations. The RAOs were developed based on the Applicable or Relevant and Appropriate Requirements (ARARs). RAOs were not developed for sediments or surface water, as these three media did not pose any risk to human health or the environment. RAOs were developed for groundwater, which poses elevated risk through hypothetical future ingestion by residents in the vicinity of the Site. RAOs were not developed for soil because the results of the RI and previous sampling events did not indicate soil contamination in the vadose zone which can be indicative of the source for groundwater impact.

Remedial alternatives for groundwater are evaluated based on the potential to reduce the volume of Site related chemicals in the subsurface and/or eliminate direct exposure to the contaminants. RAOs for groundwater, aimed at protecting human health and the environment at the Site, can be summarized as follows:

- Prevent exposure to contaminated groundwater, above acceptable risks; and
- Prevent or minimize further migration of contaminated groundwater

The extent of the dissolved groundwater contaminant plume within the overburden is limited to the center and northwest part of the property. The dissolved contaminants of concerns (COCs) in groundwater are PCE and TCE in the center of the plume and low detections of 1,1-DCA and 1,1-DCE at the downgradient end of the plume. Currently, groundwater discharge does not impact surface water or ecological resources at the Site. The objectives for the remedial approach to address impacts to the overburden groundwater are:

- To prevent or mitigate, to the maximum extent practicable, the migration of contaminated groundwater off Site; and
- To restore on-Site contaminated groundwater in the overburden, to the maximum extent practicable, for future use consistent with the intended land use and to contaminant concentrations that will not result in exceedances of applicable remedial goals (RGs). The SCDHEC Brownfield/Voluntary Cleanup Program RGs for groundwater consist of the USEPA MCLs and USEPA tapwater groundwater standards.

RAOs may be qualitative (prevent exposure to contaminated groundwater) or quantitative (specify the maximum contaminant concentration in groundwater). The following subsections discuss qualitative RAOs for the targeted media at the Site. RAOs are specified for the Site groundwater. These two groupings will be used throughout the FS and are further defined for the FS in Section 6.0. Table 5.1 provides a summary of the RAOs discussed in the following sections.

5.1 Media of Interest

5.1.1 Groundwater

This section describes the ARARs that may be applied to actions at the Site. The ARARs are divided into three categories: chemical-specific, action-specific, and location-specific requirements. ARARs include any standard, requirement, criteria, or limitation under federal environmental law or more stringent promulgated standard, requirement, criteria, or limitation under state environmental or facility siting law that is legally applicable to the hazardous substance or is relevant and appropriate under the circumstances. Table 5.1 presents the ARARs for groundwater applicable to the Site and action for each ARAR. The chemical specific ARARs are used to develop quantitative RAOs, determine the appropriate extent of Site clean-up, and govern the implementation and operation of the selected action. The groundwater plume is defined as select VOCs impacted groundwater in the shallow aquifer restricted at the Property. Groundwater RAOs are presented on Table 5.2.

Location-specific requirements set restrictions on activities according to characteristics of the site or its immediate environs. These requirements may apply if the Site is located in such a restricted area. Location-specific ARARs may affect Site activities and represent restrictions placed on the concentration of hazardous substances or the conduct of activities because of the location or characteristics of a site. These ARARs set restrictions relative to the presence of specific natural or manmade features or potentially affected resources at a clean-up site. Potentially-impacted features or resources at or surrounding the Site include floodplains, and fish and wildlife resources.

Streams and Floodplains

The Site is situated approximately 1500 ft south of tributary of South Durbin Creek. A small tributary stream also extends from just south of the Site to Reedy Creek. The property is not located within the floodplain or wetland areas, but during periods of intense rainfall run-off from the Site may enter the small tributaries. Table 5.3 presents location-specific ARARs that may be applicable or relevant and appropriate for these Site vicinity activities conducted within floodplains.

Fish and Wildlife Resources

The small tributaries north and south of the Site may carry surface water run-off from the property to South Durbin and Reedy Creeks. Fish and wildlife potentially use the creeks as habitat or as a water resource and therefore location-specific ARARs are considered for this area. Table 5.3 presents location-specific ARARs that may be applicable or relevant and appropriate for Site activities that may adversely affect any fish or wildlife resources in the creeks.

Action-specific ARARs set controls or restrictions on particular kinds of activities related to the management of hazardous waste and are triggered by the type of remedial action being considered. Action-specific ARARs involve design, implementation, and performance requirements that are generally technology- or activity-based. Selection of a particular remedial action may invoke appropriate action-specific ARARs that may specify particular performance standards or technologies, as well as specific environmental levels for discharged or residual chemicals. Action-specific ARARs may be established under the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA) or other laws or regulations including state acts governing waste management.

5.1.2 Remediation Goals for Groundwater

Typically, RGs are based on the chemical-specific ARARs (e.g., MCLs or tapwater) however, risk-based RGOs are sometimes selected as RGs when more protective than the ARARs or when an ARAR was unavailable. The USEPA Region 4 Tap Water RSL (May 2020) was selected as the RG for constituents that did not have MCLs. The MCLs and Tap water RSLs which are selected as the RGs for groundwater are summarized in Table 5.4A.

The maximum concentrations of constituents detected in groundwater were compared to the selected RGs. Six constituents were detected at concentrations above the Site-specific RGs, and are therefore considered COCs in groundwater, including: 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethene, 1,1-dichloroethane, 1,1-dichloroethene, tetrachloroethene, and trichloroethene. Table 5.4B summarizes COCs in groundwater with maximum detected concentrations above the RGs.

6. Remedial Technologies

6.1 Remedial Technologies

This section identifies and screens potential remedial technologies for the impacted media at the Site. Summary of each of the most applicable remedial technologies is included below:

6.1.1 No Action

The no action response is primarily used as a basis for comparison with other alternatives. Under the no action response, no measures are taken to alter environmental conditions at the Site, however, in some cases monitoring may continue as appropriate. This response does not reduce the volume, mobility or toxicity of the hazardous constituents of the Site media except to the extent that the constituent concentrations are reduced through natural mechanisms.

6.1.2 Institutional Controls and Monitored Natural Attenuation (MNA)

Institutional Controls (ICs) include any type of physical, legal, or administrative mechanisms that restrict the use of the property in accordance with a remedial decision, including the existing restrictive covenants. ICs and monitoring responses are not intended to reduce the toxicity, mobility or volume of hazardous site constituents but to reduce the potential of human and wildlife exposure to those constituents. Options may include implementation of a long term monitoring program to track contaminant migration and transport, and initiation of ICs to restrict or limit exposure to contaminated media. This technology applies to any restriction or control that limits the use of any portion of the property arising from the need to protect human health and the environment.

Monitored natural attenuation (MNA) has been identified with reliance on natural physical, chemical, and biological processes under favorable conditions to reduce contaminant concentrations their toxicity and mobility in groundwater. MNA requires regular groundwater monitoring to achieve site-specific remediation objectives within a timeframe that is reasonable compared to those of other more active remedial methods. This technology is applicable to the impacted media at the site in combination with other remedial alternatives.

6.1.3 In Situ Chemical Oxidation

ISCO is an effective method for destroying localized high concentrations of a wide range of organic compounds, particularly PCE and TCE. In an oxidation reaction, the oxidizing agent breaks the carbon bonds in the compounds and converts them into nonhazardous or less toxic compounds, primarily carbon dioxide and water. Commonly used oxidizing reagents include potassium permanganate (KMnO4), Fenton's Reagent (hydrogen peroxide in a solution of ferrous salts), catalysed sodium persulfate, and ozone. ISCO would be an effective treatment for CVOC at the Site by oxidizing VOCs to carbon dioxide, chloride ions and water.

6.1.4 In Situ Enhanced Biodegradation

In situ biodegradation (ISEB) (aerobic or anaerobic) is a treatment process whereby contaminants are metabolized into less toxic or nontoxic compounds by naturally occurring augmented microorganisms. Site conditions can be manipulated to enhance in situ biodegradation processes and speed up degradation rates of Site hydrocarbons. In order to stimulate biological activity, biodegradation processes can be enhanced by the injection of nutrients, microbial cultures, suitable electron acceptors, and carbon/energy sources. In this process, several techniques can be applied to enhance biodegradation of the hydrocarbons, such as:

i) Injection of an organic substrate such as emulsified vegetable oil (EVO) to stimulate enhanced biodegradation of certain compounds such as PCE, TCE and highly chlorinated aromatic compounds under anaerobic conditions;

ii) Nutrient supplementation with suitable sources of nitrogen and phosphorus to enhance biodegradation of contaminants by indigenous microbial population; and

iii) Bio-augmentation by injection of microbial cultures to improve the effectiveness of the microbial population in degrading the compounds of concern.

ISEB under anaerobic conditions would be an effective treatment for the CVOC present at the Site. The current groundwater condition the site does not exhibit anaerobic conditions.

6.1.5 Groundwater Extraction, Treatment and Discharge

Groundwater extraction is used as a combined mass removal and containment strategy. Groundwater extraction wells can be used to remove mass by extracting impacted source area groundwater and can control the migration of groundwater contaminants by altering the hydraulic gradient of the aquifer. Extraction wells are screened at appropriate depths to capture contaminated groundwater. The wells are usually connected using a manifold, and the contaminated groundwater is pumped through the manifold to an on-Site treatment building. Withdrawal of contaminated groundwater would require treatment in the on-Site building and subsequent discharge.

On-going evaluation of extraction well performance would be part of a long-term monitoring program. Changes to conditions that affect the performance of groundwater extraction as part of the overall remedy would be considered during monitoring events, performance reporting, and 5-year reviews and appropriate changes would be recommended, evaluated, and implemented as needed.

6.2 Screening of Potential Remedial Alternatives

Numerous remedial technologies may be effective in mitigating the presence of Site-related contaminants in shallow groundwater. In this section, remedial technologies that are potentially applicable to the impacted media and contaminants of concern are identified and screened based on the CERCLA eight evaluation criteria listed below:

- Protection of human health and the environment
- Compliance with applicable or relevant and appropriate standards
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume
- Short-term effectiveness
- Implementability

- Cost
- Community Acceptance

The primary intent of the screening process is to ensure subsequent detailed evaluations of remedial alternatives focus on technologies that are effective, applicable and acceptable to all interested parties. The overall objective of the remedy is to reduce volume of contaminants, their toxicity and mobility by implementation of appropriate remedial alternatives.

6.3 Remedial Alternatives

This section presents the site-specific potential remedial technologies and process options for the impacted media (groundwater) at the Site. Based on the preliminary evaluation of remedial technologies, the bench scale study and the pilot ISCO injection conducted at the Site, the remedies that appear to have the greatest potential to treat residual overburden groundwater at the Site in a reasonable period of time are:

- ISCO at select areas of elevated COC concentrations in groundwater (as needed);
- MNA of dilute groundwater plume;
- ISEB at select areas of elevated COCs in groundwater;
- Implementation of ICs through agreement with Bodycote restricting future groundwater use.

7. Remedial Alternatives Evaluation

The impacted media consists of groundwater where the concentrations of site COCs are present above the applicable regulatory standards. As directed by the SCDHEC, this alternatives evaluation has been developed in accordance with the general guidelines under CERCLA as detailed in the *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (USEPA 1988). The comparative analysis of each remedial alternatives is presented in Table 7.1. The following subsections include brief summaries of the site-specific considerations. The alternatives were selected to address the groundwater impact. The following summarizes a brief evaluation of the site-specific remedial technologies considerations.

7.1 Alternative #1

No Action

Technical Description

Alternative #1 includes no remedial action for reduction, control or monitoring of potential future human health risk associated with groundwater from the property. The ‘No Action” is required by US EPA guidance as a baseline to compare other remedial action alternatives.

Protection of Human Health and the Environment

Although the “No Action” alternative does not incorporate any activities that would present exposure risks to the community, workers, or the environment, it would not document reduction of existing concentrations in groundwater or provide measures to eliminate or control potential exposure pathways associated with possible future use of contaminated groundwater. Natural attenuation processes will reduce average concentrations to meet RGs within groundwater over time, although monitoring of these processes would not be performed. Therefore, the “No Action” alternative would not document that groundwater RAOs are being met and is therefore not protective of human health.

Compliance with ARARs

Alternative #1 would not comply with chemical specific ARARs for groundwater in the short-term because no data would be obtained to determine if concentrations had decreased to concentrations below the RGs. However, No Action would likely comply with ARARs over time through natural attenuation given the active treatment of the source soils. There are no action specific ARARs for Alternative # 1.

Long-term Effectiveness and Permanence

The “No Action” alternative does not achieve long term effectiveness and permanence because there are no institutional controls to eliminate or provide long-term control of potential exposure pathways. Natural attenuation processes will over time reduce average concentrations in groundwater to RGs but monitoring of these processes would not be performed under the “No Action” alternative. Therefore, the No Action Alternative would not be an effective solution for documenting compliance with the RAOs within a reasonable timeframe.

Reduction of Mobility, Toxicity or Volume

Natural attenuation mechanisms will result in reduction of toxicity and volume in groundwater, although monitoring of these processes would not be performed. The statutory preference for documenting compliance with RAOs is not satisfied by the “No Action” alternative.

Short-Term Effectiveness

The “No Action” alternative does not incorporate any Site activities that would present exposure risks to the community, workers, or the environment. Protectiveness would be achieved through the “No Action” alternative.

Implementability

Due to the lack of technical components, the “No Action” alternative is technically and administratively feasible and would not limit or interfere with the ability to perform future remedial actions.

Cost

There are no associated costs with the “No Action” alternative because no actions of any kind would be performed in connection with this alternative.

7.2 Alternative #2

Institutional Controls and MNA

Technical Description

Alternative #2 combines institutional controls along with MNA performance evaluation following remediation of COCs in groundwater to protect human health. Institutional controls such as groundwater use or deed restriction would be implemented to restrict future withdrawal of groundwater from the Property. Proposed locations for Alternative #2 groundwater remedy and monitoring locations are shown on Figure 7.1

MNA performance evaluation of residual COCs in groundwater would be conducted using the existing monitoring well network. MNA relies on naturally existing physical (e.g., dilution, dispersion, volatilization), chemical (e.g., hydrolysis, precipitation), and biological processes to reduce contaminant concentrations in soil and groundwater over time. Long-term monitoring of these processes would be conducted to monitor and assess the effectiveness of this alternative. Groundwater monitoring activities would be conducted for a period of five years with the option to end if RAOs are reached. Monitoring activities would include groundwater potentiometric surface elevation gauging to assess groundwater flow direction; and groundwater sample collection and analysis for VOCs to assess VOC concentrations over time and MNA parameters (e.g., total organic carbon, nitrate, nitrite, sulfate, sulfide, ferric and ferrous iron, chloride, ethene, ethane, and methane) to evaluate other evidence that MNA is occurring and that aquifer conditions are suitable for MNA.

Protection of Human Health and the Environment

An MNA performance evaluation would document natural attenuation processes that, in conjunction with previous source area remedial actions, would potentially reduce concentrations in groundwater to achieve RGs in a reasonable timeframe. A more accurate estimate of the time to achieve the RAO will be assessed during the five-year monitoring period.

Monitoring of these processes would be performed to document the reductions of concentrations. Institutional controls in the form of groundwater use restriction would provide additional protection against human exposure to groundwater. These combined actions of Alternative #2 would achieve RAOs and be protective of human health and the environment. Performance monitoring would entail periodic Site activities that are not expected to present exposure risks to the community, workers, or the environment.

Compliance with ARARs

Alternative #2 in conjunction with institutional control, would comply with chemical specific ARARs (EPA MCLs or tap water) for groundwater over time. This alternative would comply with location-specific ARARs such as avoiding or minimizing short and long term impacts associated with occupancy of floodplain as stated on Table 5.3 and action-specific ARARs such as following established standards for construction of monitoring wells.

Long-Term Effectiveness and Permanence

Long term effectiveness and permanence would be achieved through MNA in conjunction with the institutional control at the property. The MNA performance evaluation would be implemented to confirm the effectiveness of this combination. COC concentrations in groundwater are expected to decrease steadily over time and are estimated to ultimately achieve RAOs. Institutional controls in the form of groundwater use restriction would protect against human exposure to VOC concentrations in groundwater until RAOs are achieved. This alternative would comply with the requirement of achieving long term effectiveness and permanence.

Reduction of Mobility, Toxicity, or Volume

Monitored natural attenuation processes will reduce mobility, toxicity, and volume of COCs in groundwater over time. The MNA performance evaluation will be conducted to confirm that these reductions in concentrations will achieve RAOs in a reasonable timeframe. If the evaluation determines that RAOs will not be achieved in a reasonable timeframe, then additional active treatment of groundwater would be proposed at the end of the evaluation period.

Short-Term Effectiveness

Alternative #2 incorporates Site activities associated with groundwater sampling that would present minimal increased exposure risks to workers. This alternative does not incorporate activities that would present exposure risks to the community or environment. Short-term protectiveness could be achieved through this method. Groundwater monitoring data shows that attenuation is occurring. MNA would monitor the overall effectiveness.

Implementability

Alternative #2 is technically and administratively feasible and would not limit or interfere with the ability to perform future remedial actions.

Cost

Capital costs include implementation of institutional controls at an estimated cost of approximately $50,000. Average annual costs include monitoring of groundwater for VCs and MNA parameters and periodic maintenance of the institutional controls and are estimated to be approximately $40,000 annually for years 1-2, $30,000 annually for years 3-5 and $20,000 annually for years 6-10. The duration of Alternative #2 estimated to reach the RAO is 10 years. For cost comparison purposes, 10-year time frame is used for each remedial alternative. Based on USEPA guidance, the total present value life cycle cost of this alternative to achieve RAO in 10 years is $250,000.

7.3 Alternative #3

In Situ Chemical Oxidation

Technical Description

Alternative #3 combines the use ISCO by injection of a chemical oxidant solution into impacted areas of the aquifer and a performance evaluation of groundwater. Groundwater remedy for Alternative #3 and performance monitoring locations are shown on Figure 7.2.

A chemical oxidant solution would be injected into the aquifer to react with COCs to produce less toxic products. Injection volume, injection frequency and total number of injection events would be determined by evaluation of operational parameters over the course of the remediation.

Base catalyzed sodium persulfate, a chemical oxidant, is rapid, aggressive, and insensitive to chemical contaminant characteristics and concentrations. It directly oxidizes the chlorinated solvent, producing carbon dioxide as a byproduct. Base catalyzed sodium persulfate is stable and easy to handle and inject and would be

injected in a grid pattern over the areal extent, and across the vertical zone in source zones or hot spots of aqueous contaminant plumes. The oxidative chemical will be pressure-injected into the subsurface using DPT. The intent will be to thoroughly permeate the contaminated zone with sufficient quantity of the injected material that will be left in place, where either the chemical can contact and fully react with COCs in-situ, or where it passively works to stimulate contaminant degradation.

Monitoring of COCs would also be conducted in on-site monitoring wells to assess remediation performance and to refine the injection program if necessary. A performance evaluation period would also be implemented with Alternative #3 to evaluate the combined effectiveness of the selected ISCO remediation of groundwater. IC and MNA may be implemented as a follow up to completion of ISCO to meet the long-term goal under Alternative #3.

Protection of Human Health and the Environment

Under this alternative, groundwater would be treated with ISCO to reduce groundwater COC concentrations to meet the RAO. Destruction of COCs in groundwater with ISCO would reduce potential future exposure to humans and the environment and would satisfy the statutory preference for treatment as a primary component of the remedy. Natural attenuation processes will reduce average concentrations of remaining COCs in areas where ISCO was not performed. The performance evaluation monitoring period would be implemented to confirm that concentrations are decreasing at a sufficient rate. Institutional controls in the form of groundwater use restrictions would provide additional protection against potential future human exposure to groundwater. These combined actions are expected to achieve RAOs in 5 years and would be protective of human health and the environment.

Compliance with ARARs

Alternative #3 would comply with chemical specific ARARs for groundwater (MCLs and/or tapwater) within the above specified timeframe. Alternative #3 would comply with the location-specific ARARs presented in Table 5.3. Alternative #3 will comply with applicable action-specific ARARs such as obtaining underground injection control (UIC) permit before injection, following standard procedures during construction of the injection wells, conducting the ISCO injection following procedures and requirements and abandoning injection wells following the permit requirements.

Long-Term Effectiveness and Permanence

Alternative #3 would achieve long-term effectiveness and permanence through destruction of a significant portion of the groundwater COCs by chemical oxidation. This alternative would further reduce groundwater concentrations over time through MNA to permanently achieve RAOs. However, in order to maintain long-term effectiveness and permanence, the institutional controls will need to be maintained until all RAOs are achieved for groundwater.

Reduction of Mobility, Toxicity, or Volume

Alternative #3 would result in the reduction of the mobility, toxicity, and volume of COCs in groundwater through ISCO. Bench scale study would be performed to determine the optimum volume and concentration of the chemical oxidation before implementation of the ISCO. Using optimum volume and concentration of the chemical oxidant would target the area of interest and facilitate reduction of contaminant. Performance evaluation would be conducted to confirm that these reductions in concentrations will achieve the remedial goal. The statutory preference for treatment as a principal element is satisfied with ISCO as implemented in Alternative #3. MNA may be implemented to further reduce the mobility, toxicity, and volume of remaining COCs in groundwater over time.

Short-Term Effectiveness

Implementation of this alternative would result in increased potential risks to site workers due to the transport and Site use of chemical oxidants. While there are potential risks to site workers handling the ISCO chemicals, these remedial options are routinely implemented safely by following specific health and safety plans. ISCO activities, groundwater sampling, and other Site activities would be conducted using industry approved methods. The groundwater COCs would be reduced in the short-term meeting the requirements.

Implementability

Implementation of this alternative on-Site is both technically and administratively feasible. ISCO would be conducted using standard methods and materials which are readily available. Institutional controls and groundwater monitoring activities would be readily implementable.

Cost

Typical capital costs include ISCO injection, system installation and performance monitoring. O&M costs include two years of ISCO injection and three years of performance evaluation. The total remediation duration of Alternative #3 for costing purposes is 5 years of performance evaluations followed by 5 years of MNA.

Total capital costs are estimated to be approximately $200,000 for one round of ISCO Injection and system installation. Annual costs for semi-annual performance evaluation events are approximately $50,000 for years 1-5. Average annual costs include monitoring of groundwater (semi-annually to annually) and periodic maintenance of the institutional controls and are estimated to be approximately $30,000 per year for years 6-10. The total present value life cycle cost of Alternative #3 to achieve RAO in 10 years is approximately $600,000. Actual costs would be based upon design considerations.

7.4 Alternative #4

In Situ Enhanced Biodegradation

Technical Description

Alternative #4 combines the use of ISEB by enhancing reductive dechlorination, implementation of institutional controls, and performance evaluation of groundwater. Groundwater remedy plan for Alternative #4 and performance monitoring locations are shown on Figure 7.3.

ISEB design and implementation procedures may vary dependent on results of a pilot test but would involve installation of up to ten injection wells on the Property targeting areas of groundwater containing elevated concentrations of COCs. Addition of the organic carbon solution is designed to stimulate naturally occurring microorganisms, deplete oxygen and other available electron acceptors, and thereby establish and maintain anaerobic and reducing conditions in groundwater. The reduced conditions and stimulated microbial activity would promote degradation of the COCs to dechlorination end-product ethene.

It is assumed that injections of dilute organic carbon substrate solution would be performed once a year for approximately three years. Actual period of injections may be less pending evaluation of the operational parameters. A performance evaluation period would also be implemented with Alternative #4 to evaluate the effectiveness of the selected remedy and reduction of groundwater impacts. After the 10-year performance evaluation period, the data would be evaluated to support a decision whether to implement a final MNA and IC remedy or to continue additional active treatments.

Protection of Human Health and the Environment

Destruction of COCs in groundwater using enhanced reductive dechlorination would reduce potential future exposure to humans and the environment and would satisfy the statutory preference for treatment as a primary component of the remedy. ISEB has the potential to extend the zone of treatment downgradient in the direction of groundwater flow from the points of injection. This mechanism has several benefits, including: 1) increased area of treatment; 2) higher total COC mass removal; and 3) treatment zone accessibility in areas where surface accessibility is limited. Natural attenuation processes will reduce average concentrations of remaining VOCs in areas where ISEB was not performed to RAOs in a reasonable time frame. The performance evaluation monitoring period would be implemented to confirm that COC concentrations are decreasing at a sufficient rate. These combined actions would achieve RAOs in a reasonable timeframe and would be protective of human health and the environment.

Compliance with ARARs

Alternative #4 would comply with chemical specific ARARs for groundwater (MCLs and/or tap water) within the above specified timeframe. Alternative #4 would comply with the location-specific ARARs presented in Table 5.3. Alternative #4 will comply with applicable action-specific ARARs such as obtaining underground injection control (UIC) permit before injection, following standard procedures during construction of the injection wells, conducting the ISEB injection following procedures and requirements and abandoning injection wells following the permit requirements.

Long-Term Effectiveness and Permanence

Alternative #4 would achieve long-term effectiveness and permanence through destruction of a significant portion of the groundwater COCs by reductive dechlorination. The injection program to establish and maintain a reductive aquifer zone may take approximately 3 to 5 years. This alternative would further reduce groundwater concentrations over time through MNA to permanently achieve RAOs. However, in order to maintain long-term effectiveness and permanence, the institutional controls will need to be maintained until all RAOs are achieved for groundwater.

Reduction of Mobility, Toxicity, or Volume

Alternative #4 would result in the reduction of the mobility, toxicity, and volume of COCs in groundwater through enhanced reductive dechlorination. MNA would further reduce the mobility, toxicity, and volume of remaining COCs in groundwater over time. The performance evaluation will be conducted to confirm that these reductions in concentrations will achieve RAOs in a reasonable timeframe. If the evaluation determines that RAOs will not be achieved in a reasonable timeframe, then additional active treatment of groundwater would be proposed at the end of the evaluation period. The statutory preference for treatment as a principal element is satisfied with ISEB as implemented in Alternative #4.

Short-Term Effectiveness

Implementation of Alternative #4 would result in increased potential risks to Site workers. methods. Implementation of this alternative is expected to result in increased potential short-term risks to the site workers associated with installation of the ISEB injection wells and performance of the injection events. While there are potential risks to site workers handling the ISEB chemicals, these remedial options are routinely implemented safely by following specific health and safety plans.

Implementability

Implementation of this alternative is both technically and administratively feasible. ISEB would be conducted using standard methods and materials which are readily available. Institutional controls and groundwater monitoring activities would be readily implementable.

Cost

Capital costs include ISEB injection and system installation. O&M costs include three years of annual ISEB injections and ten years of performance evaluation. The total remediation duration of Alternative #4 for costing purposes is 5 years for performance evaluation and 5 years for MNA. For cost comparison purposes, 10-year timeframe is used for each remedial alternative.

Total capital costs are estimated to be approximately $300,000 for two years for the ISEB and system installation. Annual costs for semi-annual performance evaluation events are approximately $40,000 for years 1-5. Average annual costs include monitoring of groundwater and periodic maintenance of the institutional controls and are estimated to be approximately $30,000 for years 6-10. Based on USEPA guidance, the total present value life cycle cost of Alternative #4 to achieve RAO in 10 years is approximately $650,000.

7.5 Alternative #5

Groundwater Extraction, Treatment and Discharge

Technical Description

Alternative #5 combines the use of extraction, treatment, and discharge of groundwater, implementation of institutional controls, and a performance evaluation of groundwater at the Site. The system would consist of an air stripper that discharges treated groundwater to the publicly owned treatment works (POTW). The treated groundwater may require secondary treatment with granular activated carbon (GAC) prior to POTW discharge depending on air stripper effectiveness and discharge limits. Vapors from the air stripper would be discharged directly to the atmosphere or treated with GAC depending on vapor concentrations and state and local discharge limits.

Three extraction wells would be installed along the path of the groundwater plume to extract the impacted groundwater. The extraction wells will be constructed of at least 4-inch diameter PVCpipes and screened targeting

the entire impacted aquifer zone. Alternative #5 groundwater remedy plan and monitoring locations are shown on Figure 7.4.

Groundwater would be pumped from extraction wells to a treatment building and would be analyzed periodically to assess optimization of the extraction systems. It is expected that mass removal rates would decline steadily during the groundwater extraction phase. After the groundwater extraction period is completed, natural processes would take over as the primary attenuation mechanism of COCs in groundwater.

A ten-year performance evaluation period would also be implemented with Alternative #5 to evaluate the effectiveness of the groundwater extraction actions. After the fifteen-year performance evaluation period, the data would be evaluated to support a decision whether to implement a final MNA remedy or to continue the groundwater extraction operations. Institutional controls implemented under Alternative #5 would be similar to the institutional controls described in the above alternatives.

Protection of Human Health and the Environment

Removal and treatment of COCs from groundwater with extraction would reduce potential future exposure to humans and the environment and would satisfy the statutory preference for treatment as a primary component of the remedy. Natural attenuation processes will reduce the average concentrations of COCs in areas outside of the groundwater extraction zone achieving RAOs in a reasonable timeframe. Performance evaluation monitoring period would be implemented to confirm that concentrations are decreasing at a sufficient rate. Institutional controls in the form of groundwater use restriction would provide additional protection against human exposure to groundwater. These combined actions would achieve RAOs in a reasonable timeframe and would be protective of human health and the environment.

Compliance with ARARs

Alternative #5, would comply with chemical specific ARARs for groundwater (MCLs and/or tap water) in more time than in situ remediation. Alternative #5 would comply with the location-specific ARARs presented in Table 5.3. Alternative #5 will comply with applicable action-specific ARARs such as obtaining proper permit before construction of the extraction wells, permit to discharge treated water into POTW, and other local applicable permits (as required).

Long-Term Effectiveness and Permanence

Alternative #5 would achieve long-term effectiveness and permanence through removal and treatment of a significant portion of the COCs in groundwater. This alternative also reduces migration of contaminants by creating a hydraulic barrier at the downgradient portion of property. However, this hydraulic barrier will exist only during operation of the extraction system. This alternative reduces groundwater concentrations to achieve RAOs over time, however, this alternative will take longer to reach the RAO as compared to injection alternatives. In order to maintain long-term effectiveness and permanence, the institutional controls will need to be maintained until all RAOs are achieved for groundwater.

Reduction of Mobility, Toxicity, or Volume

Alternative #5 would result in the reduction of the mobility, toxicity, and volume of COCs in groundwater through extraction and treatment. MNA would further reduce the toxicity and volume of COCs in groundwater over time. The performance evaluation will be conducted to confirm that these reductions in concentrations will achieve RAOs in a reasonable timeframe. If the evaluation determines that RAOs will not be achieved in a reasonable timeframe, then additional active treatment of groundwater would be proposed at the end of the evaluation period. If the evaluation determines that natural attenuation would achieve RAOs within a reasonable timeframe then MNA would be implemented as the final remedy at the Site.

Short-Term Effectiveness

Implementation of this alternative is expected to result in increased potential short-term risks to the Site workers associated with installation of the groundwater extraction system and performance of O&M activities. System construction, O&M activities, groundwater extraction, groundwater sampling, and other Site activities would be conducted using approved methods. Groundwater extraction and treatment would be performed for approximately 15 years followed by MNA and IC.

Implementability

Implementation of this alternative is both technically and administratively feasible. Certain buildings and structures and extraction well will be constructed at the facility to facilitate implementability. Groundwater extraction would be conducted using standard methods and materials which are readily available. Institutional controls and MNA activities would be readily implementable.

Cost

Capital costs include system design and installation. O&M costs include 10 years of O&M of the extraction and treatment system. Cost also includes 10 years of performance evaluation and maintenance of the institutional controls. The total remediation duration of Alternative #5 for costing purposes is 10 years of performance evaluation followed by ICs.

Total capital costs are estimated to be approximately $500,000 for the extraction system design and installation. Annual O&M, and institutional control costs are approximately $100,000 for 10 years. Average annual costs which include monitoring of groundwater and periodic maintenance of the institutional controls and are estimated to be approximately $30,000 for years 1-10. Based on USEPA guidance, the total present value life cycle cost of Alternative #5 to achieve RAO in 10 years is approximately $900,000.

8. Certification

Professional Geologist Statement

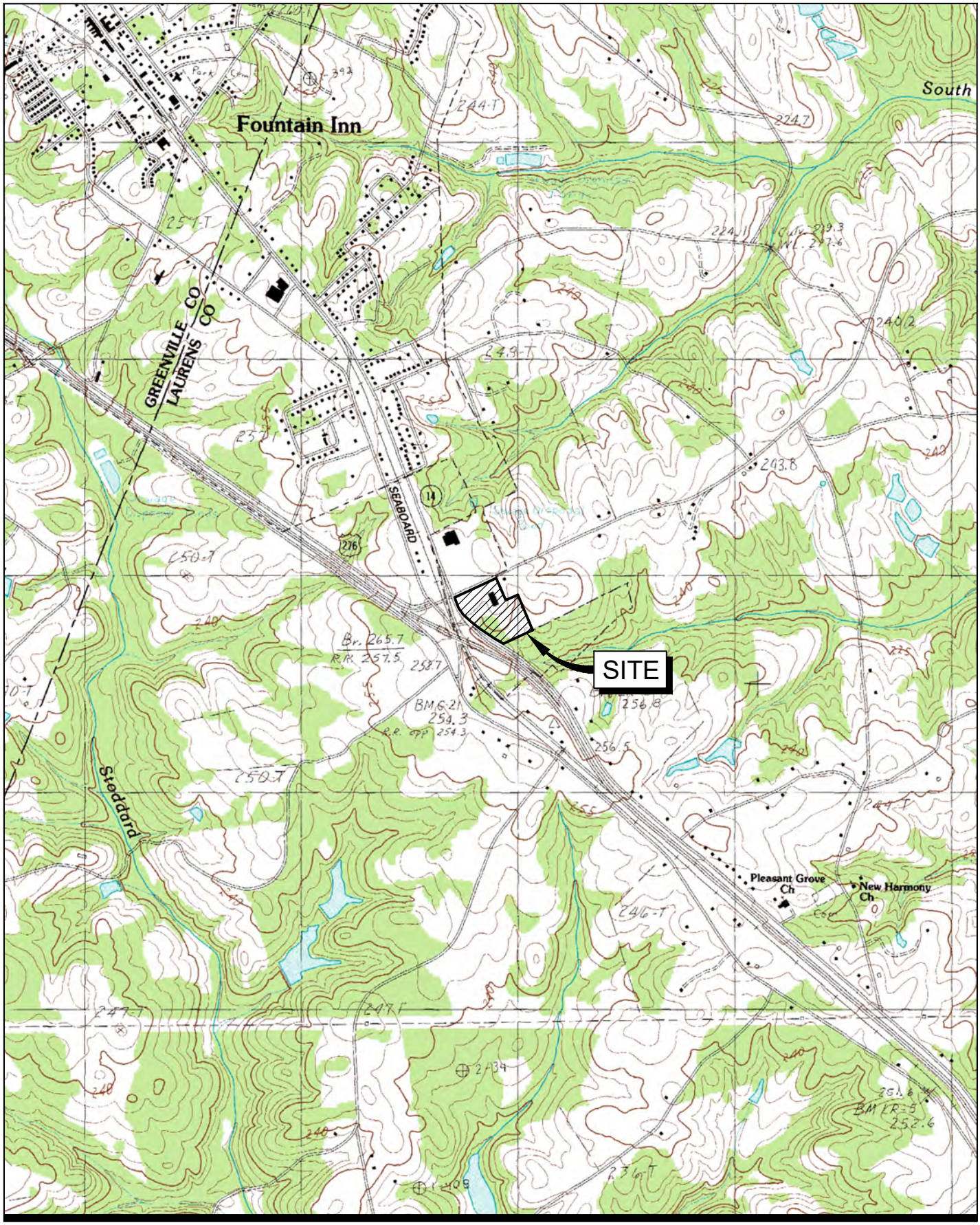
I certify that I am a qualified groundwater scientist who has received a baccalaureate or postgraduate degree in the natural sciences or engineering, and have sufficient training and experience in groundwater hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound professional judgments regarding groundwater monitoring and contaminant fate and transport. I further certify that this Revised Focused Feasibility Study Report was prepared in conjunction with others working under my direction.

Terefe Mazengia, PG #2573

Printed Name (Professional Geologist)

Signature (Professional Geologist)

Figures



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BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

Project No. **11225667**
Date **April 2021**

SITE LOCATION MAP

FIGURE 2.1

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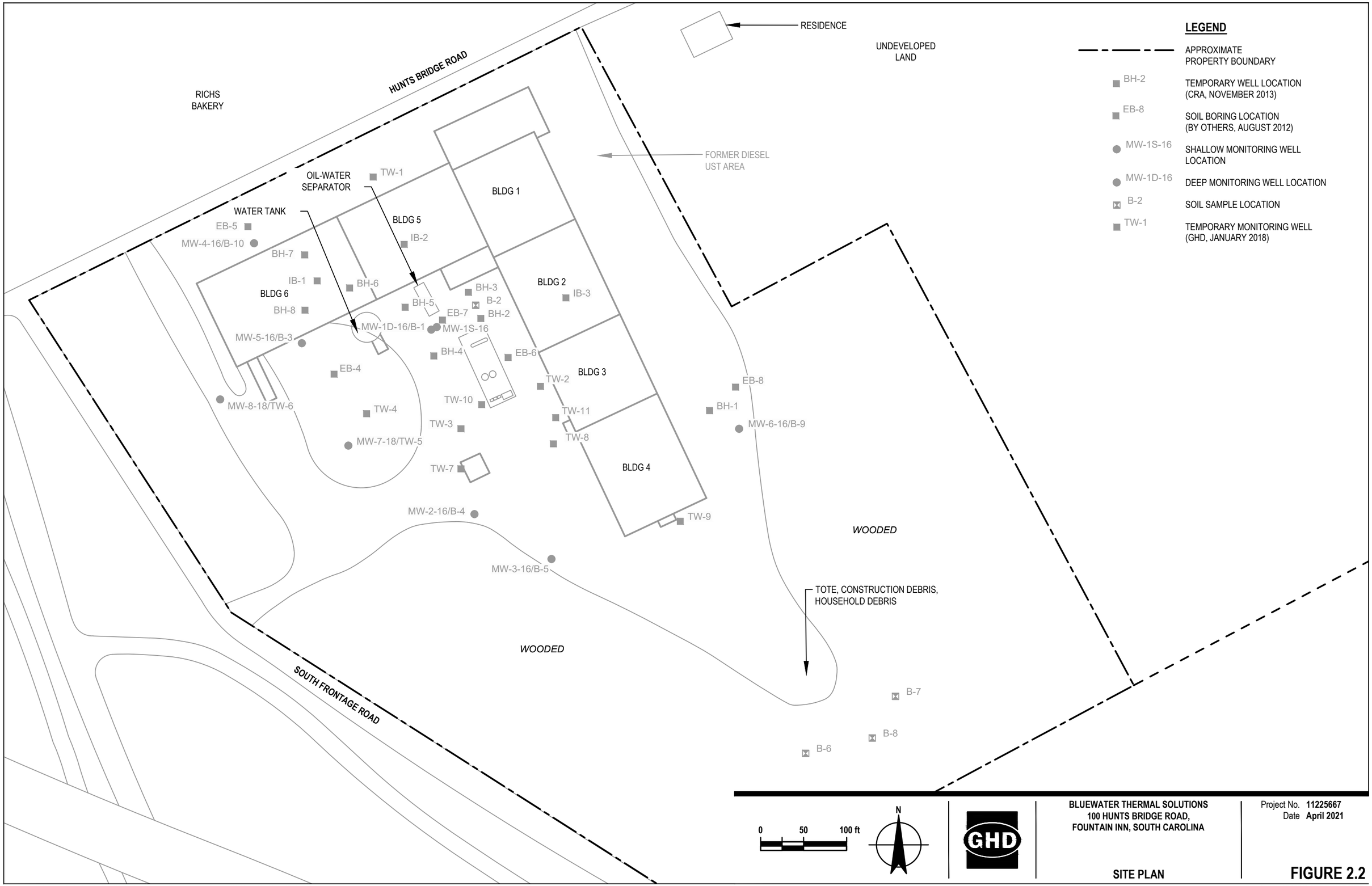

BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

Project No. **11225667**
Date **April 2021**

SITE PLAN

FIGURE 2.2

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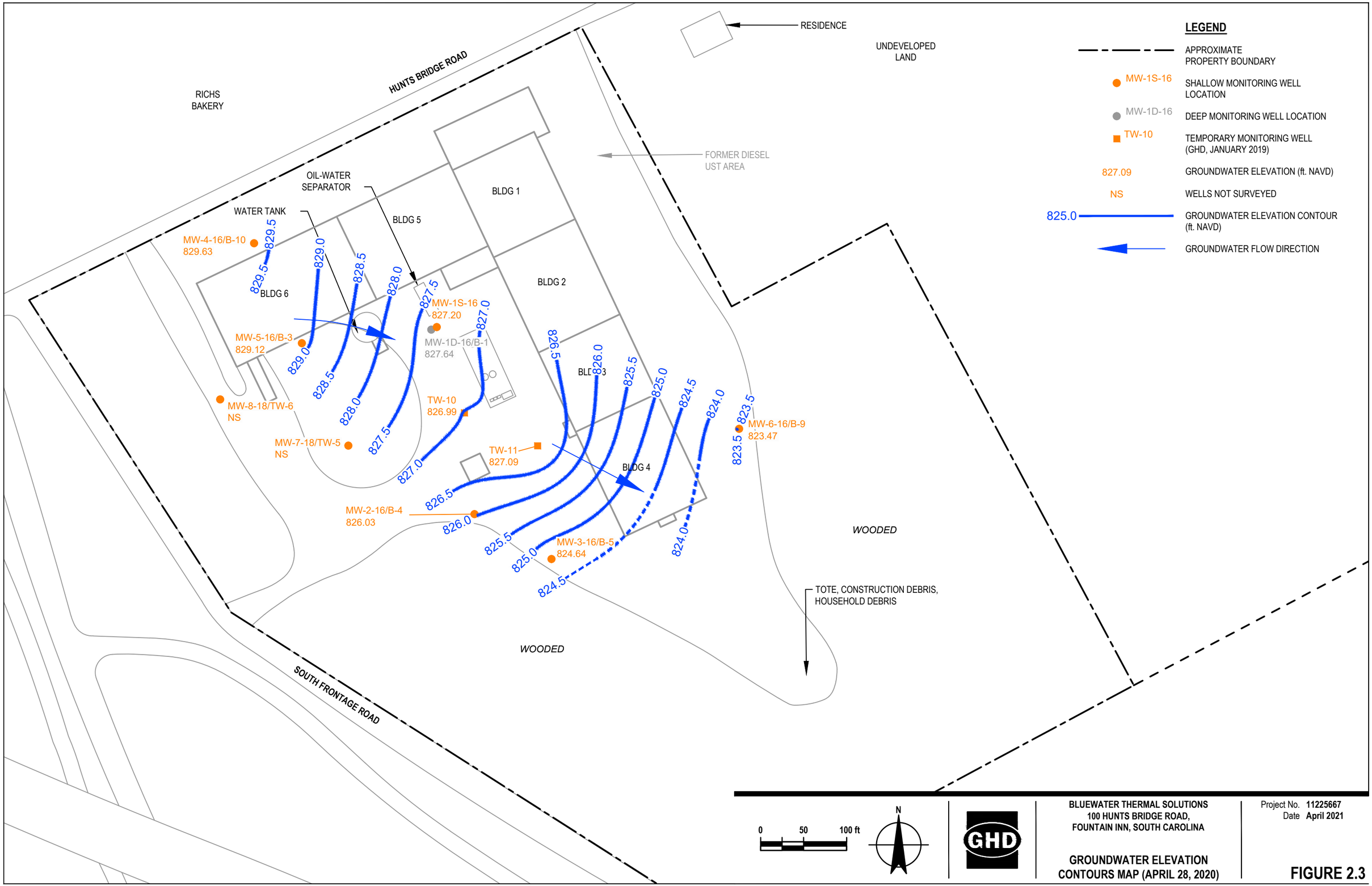
Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

GROUNDWATER ELEVATION CONTOURS MAP (APRIL 28, 2020)

Project No. **11225667**
Date **April 2021**

FIGURE 2.3

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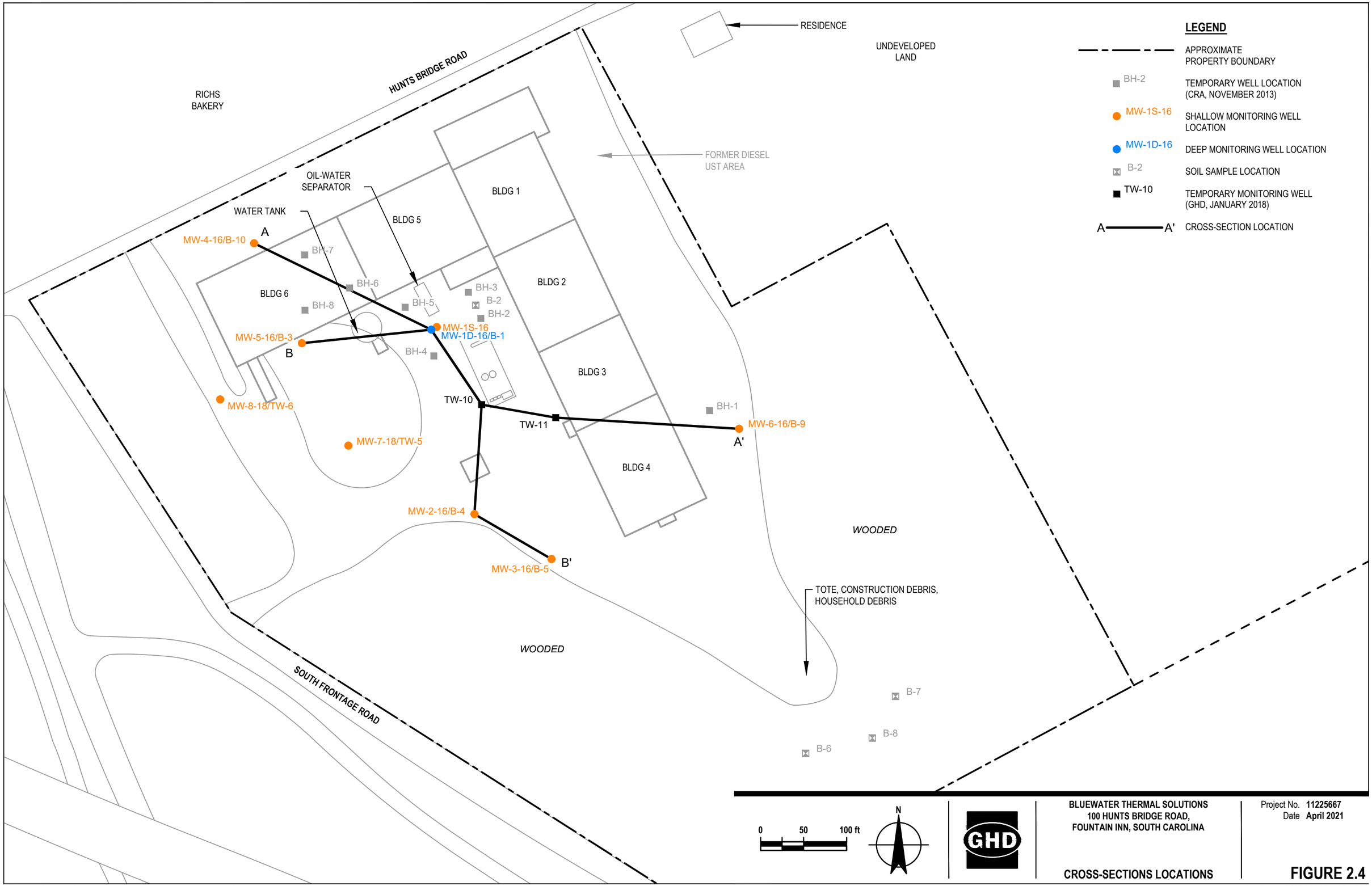
Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

Project No. **11225667**
Date **April 2021**

CROSS-SECTIONS LOCATIONS

FIGURE 2.4

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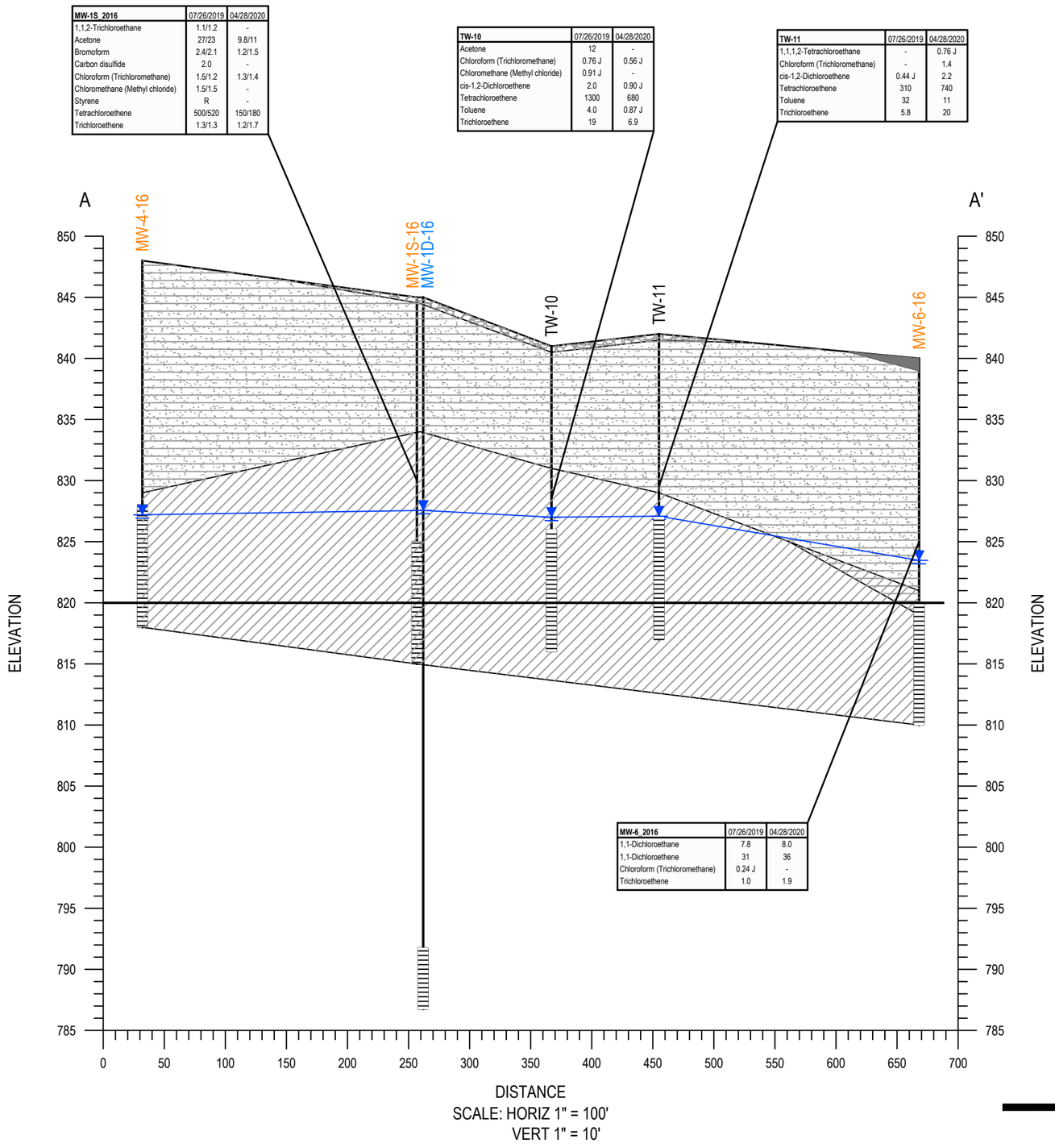
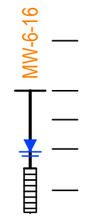
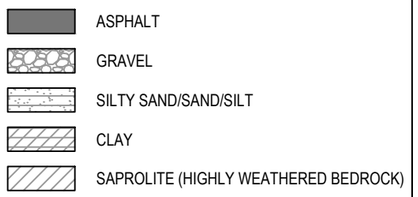
Data Source: ARCADIS SITE PLAN FIGURE 2

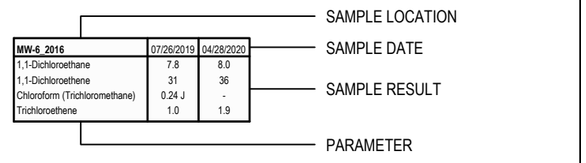


LEGEND

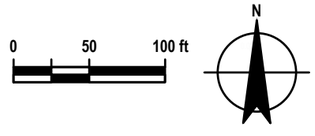


NOTE: TOC/GS ELEVATIONS OF TW-10 AND TW-11 ARE APPROXIMATE BASED ON NEIGHBORING WELLS.





chemical_name	Unit_ppb	Maximum_Contaminant_Levels_MCL	Tap_Water	Use_Crit
1,1,1,2-Tetrachloroethane	ug/L		0.57	0.57
1,1,2-Trichloroethane	ug/L	5	0.28	5
1,1-Dichloroethane	ug/L		2.8	2.8
1,1-Dichloroethene	ug/L	7	280	7
Acetone	ug/L		14000	14000
Bromoform	ug/L	80	3.3	80
Carbon disulfide	ug/L		810	810
Chloroform (Trichloromethane)	ug/L	80	0.22	80
Chloromethane (Methyl chloride)	ug/L		190	190
cis-1,2-Dichloroethene	ug/L	70	36	70
Styrene	ug/L	100	1200	100
Tetrachloroethene	ug/L	5	11	5
Toluene	ug/L	1000	1100	1000
Trichloroethene	ug/L	5	0.49	5



GHD

BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

GEOLOGICAL CROSS-SECTION A-A'

Project No. **11225667**
Date **April 2021**

FIGURE 2.5

Data Source: ARCADIS SITE PLAN FIGURE 2

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT015\11225667-GHD-0000-RPT-EN-0104_WA-015.dwg
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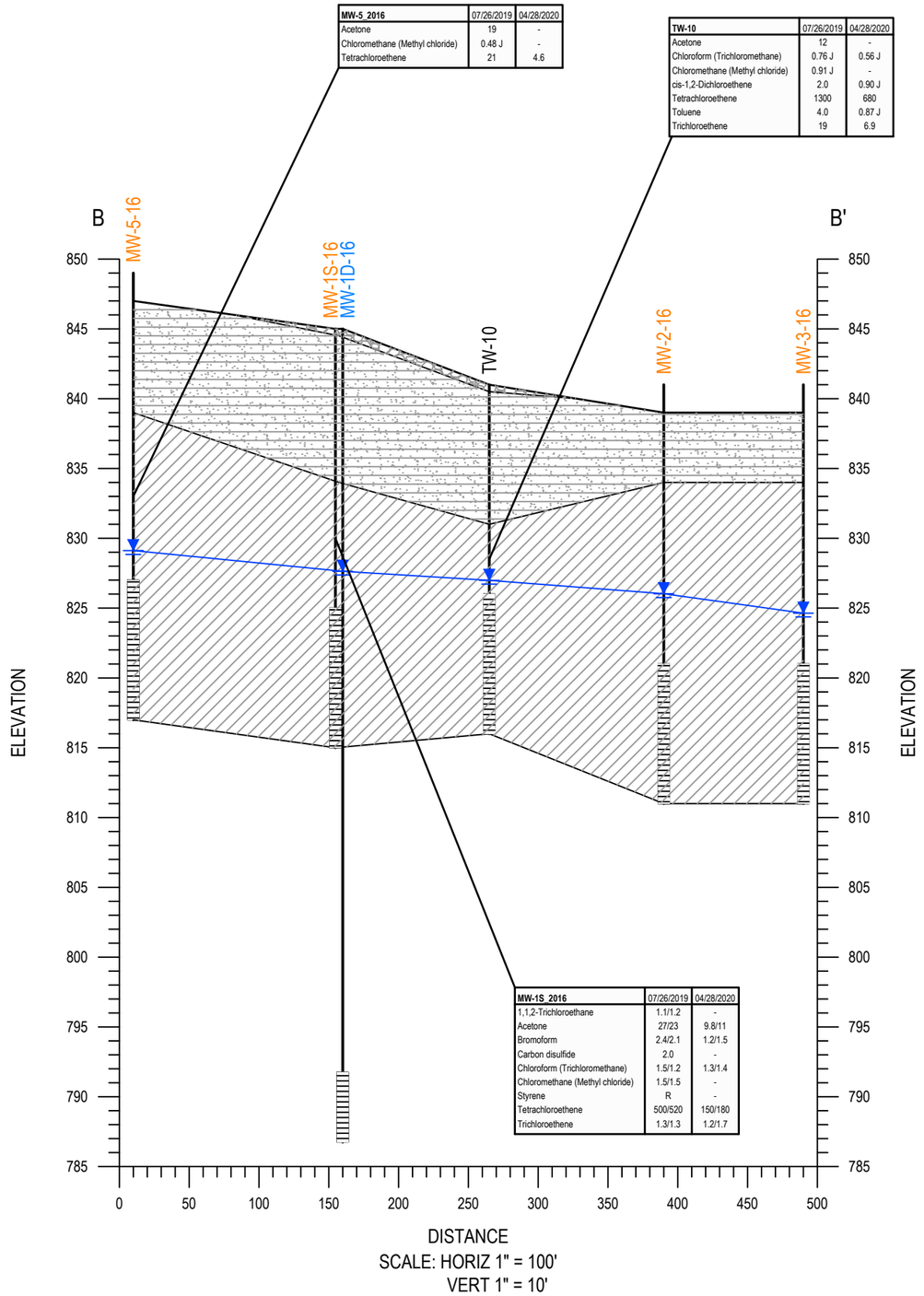
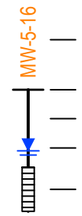


MW-5_2016	07/26/2019	04/28/2020
Acetone	19	-
Chloromethane (Methyl chloride)	0.48 J	-
Tetrachloroethene	21	4.6

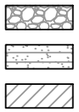
TW-10	07/26/2019	04/28/2020
Acetone	12	-
Chloroform (Trichloromethane)	0.76 J	0.56 J
Chloromethane (Methyl chloride)	0.91 J	-
cis-1,2-Dichloroethene	2.0	0.90 J
Tetrachloroethene	1300	680
Toluene	4.0	0.87 J
Trichloroethene	19	6.9

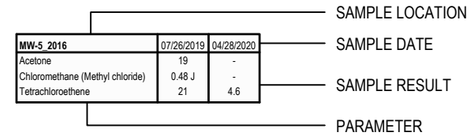
MW-1S_2016	07/26/2019	04/28/2020
1,1,2-Trichloroethane	1.1/1.2	-
Acetone	27/23	9.8/11
Bromoform	2.4/2.1	1.2/1.5
Carbon disulfide	2.0	-
Chloroform (Trichloromethane)	1.5/1.2	1.3/1.4
Chloromethane (Methyl chloride)	1.5/1.5	-
Styrene	R	-
Tetrachloroethene	500/520	150/180
Trichloroethene	1.3/1.3	1.2/1.7

LEGEND

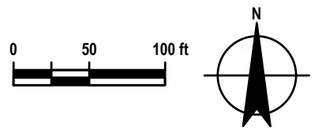


NOTE: TOC/GS ELEVATIONS OF TW-10 ARE APPROXIMATE BASED ON NEIGHBORING WELLS.





chemical_name	Unit_ppb	Maximum_Contaminant_Levels_MCL	Tap_Water	Use_Crit
1,1,1,2-Tetrachloroethane	ug/L		0.57	0.57
1,1,2-Trichloroethane	ug/L	5	0.28	5
1,1-Dichloroethane	ug/L		2.8	2.8
1,1-Dichloroethene	ug/L	7	280	7
Acetone	ug/L		14000	14000
Bromoform	ug/L	80	3.3	80
Carbon disulfide	ug/L		810	810
Chloroform (Trichloromethane)	ug/L	80	0.22	80
Chloromethane (Methyl chloride)	ug/L		190	190
cis-1,2-Dichloroethene	ug/L	70	36	70
Styrene	ug/L	100	1200	100
Tetrachloroethene	ug/L	5	11	5
Toluene	ug/L	1000	1100	1000
Trichloroethene	ug/L	5	0.49	5



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BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

Project No. **11225667**
Date **April 2021**

GEOLOGICAL CROSS-SECTION B-B'

FIGURE 2.6

Data Source: ARCADIS SITE PLAN FIGURE 2

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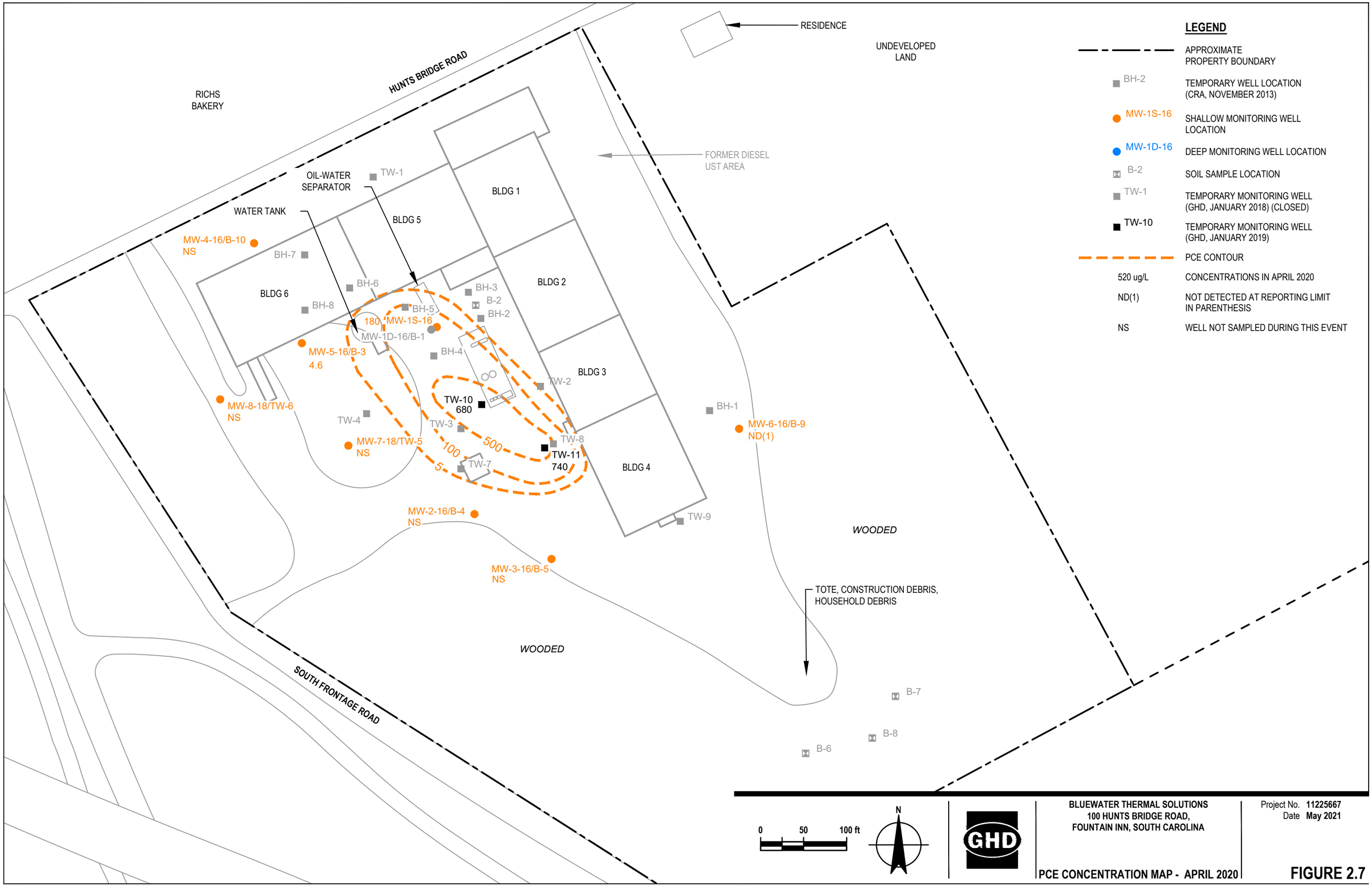


BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

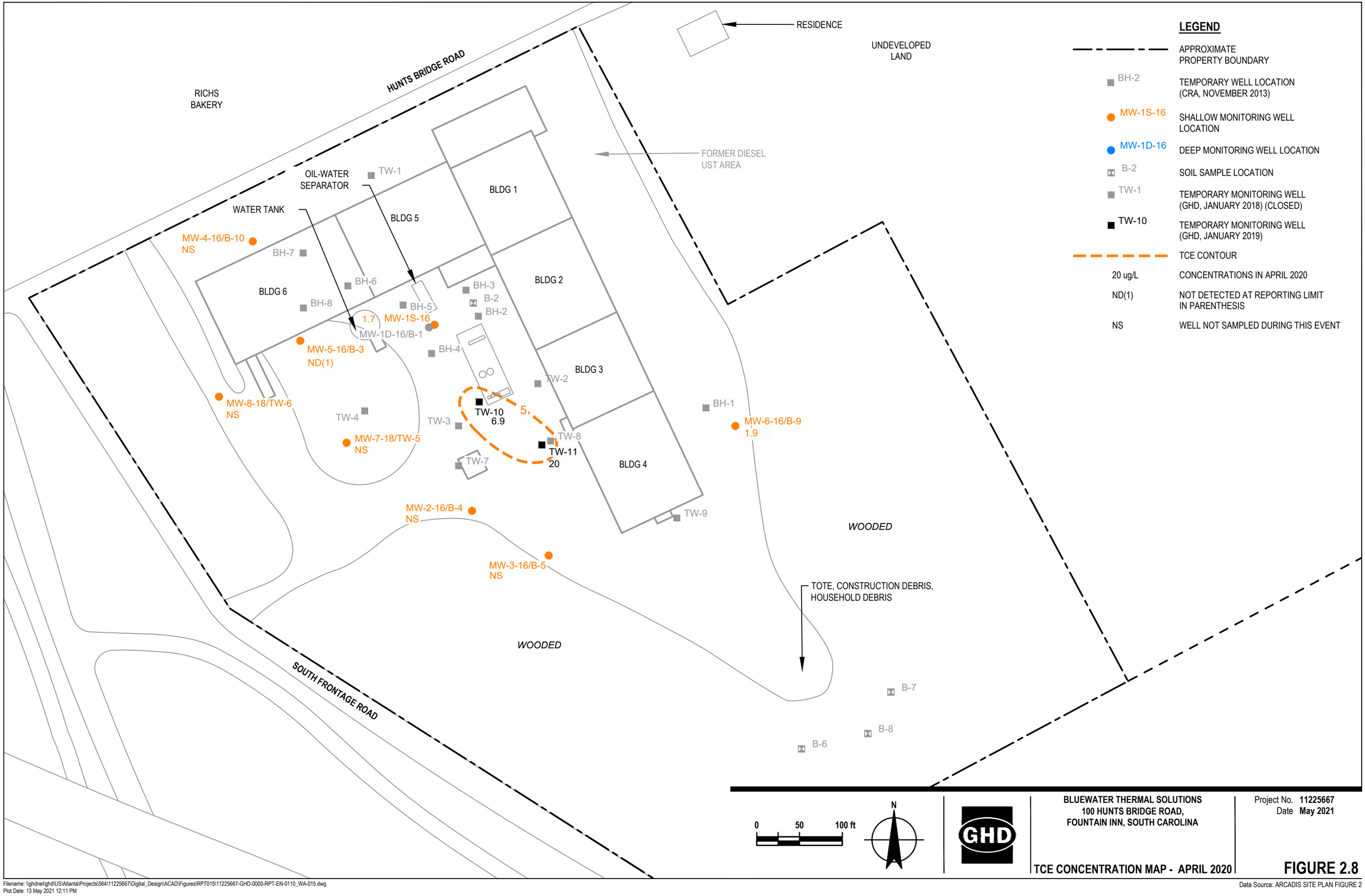
Project No. **11225667**
Date **May 2021**

PCE CONCENTRATION MAP - APRIL 2020

FIGURE 2.7

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT015\11225667-GHD-0000-RPT-EN-0109_WA-015.dwg
Plot Date: 13 May 2021 12:11 PM

Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

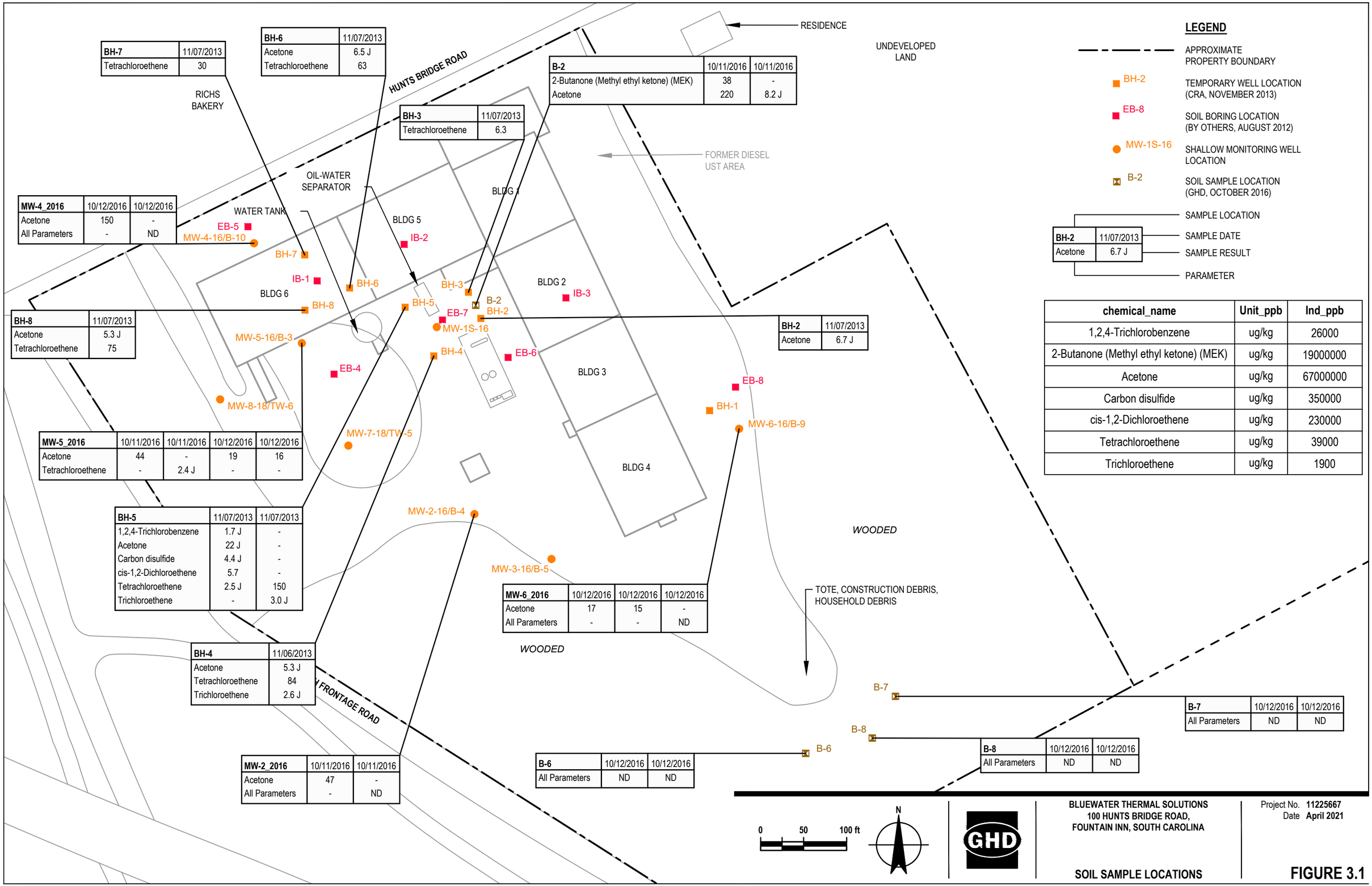
Project No. **11225667**
Date **May 2021**

TCE CONCENTRATION MAP - APRIL 2020

FIGURE 2.8

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT015\11225667-GHD-0000-RPT-EN-0110_WA-015.dwg
Plot Date: 13 May 2021 12:11 PM

Data Source: ARCADIS SITE PLAN FIGURE 2



BH-7	11/07/2013
Tetrachloroethene	30

BH-6	11/07/2013
Acetone	6.5 J
Tetrachloroethene	63

BH-3	11/07/2013
Tetrachloroethene	6.3

B-2	10/11/2016	10/11/2016
2-Butanone (Methyl ethyl ketone) (MEK)	38	-
Acetone	220	8.2 J

MW-4_2016	10/12/2016	10/12/2016
Acetone	150	-
All Parameters	-	ND

BH-8	11/07/2013
Acetone	5.3 J
Tetrachloroethene	75

BH-2	11/07/2013
Acetone	6.7 J

MW-5_2016	10/11/2016	10/11/2016	10/12/2016	10/12/2016
Acetone	44	-	19	16
Tetrachloroethene	-	2.4 J	-	-

BH-5	11/07/2013	11/07/2013
1,2,4-Trichlorobenzene	1.7 J	-
Acetone	22 J	-
Carbon disulfide	4.4 J	-
cis-1,2-Dichloroethene	5.7	-
Tetrachloroethene	2.5 J	150
Trichloroethene	-	3.0 J

MW-6_2016	10/12/2016	10/12/2016	10/12/2016
Acetone	17	15	-
All Parameters	-	-	ND

BH-4	11/06/2013
Acetone	5.3 J
Tetrachloroethene	84
Trichloroethene	2.6 J

MW-2_2016	10/11/2016	10/11/2016
Acetone	47	-
All Parameters	-	ND

B-6	10/12/2016	10/12/2016
All Parameters	ND	ND

B-7	10/12/2016	10/12/2016
All Parameters	ND	ND

B-8	10/12/2016	10/12/2016
All Parameters	ND	ND

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- BH-2 — TEMPORARY WELL LOCATION (CRA, NOVEMBER 2013)
- EB-8 — SOIL BORING LOCATION (BY OTHERS, AUGUST 2012)
- MW-1S-16 — SHALLOW MONITORING WELL LOCATION
- B-2 — SOIL SAMPLE LOCATION (GHD, OCTOBER 2016)

BH-2	11/07/2013
Acetone	6.7 J

- SAMPLE LOCATION
- SAMPLE DATE
- SAMPLE RESULT
- PARAMETER

chemical_name	Unit_ppb	Ind_ppb
1,2,4-Trichlorobenzene	ug/kg	26000
2-Butanone (Methyl ethyl ketone) (MEK)	ug/kg	19000000
Acetone	ug/kg	67000000
Carbon disulfide	ug/kg	350000
cis-1,2-Dichloroethene	ug/kg	230000
Tetrachloroethene	ug/kg	39000
Trichloroethene	ug/kg	1900

BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

Project No. **11225667**
Date **April 2021**

SOIL SAMPLE LOCATIONS

FIGURE 3.1

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT015\11225667-GHD-0000-RPT-EN-0105_WA-015.dwg
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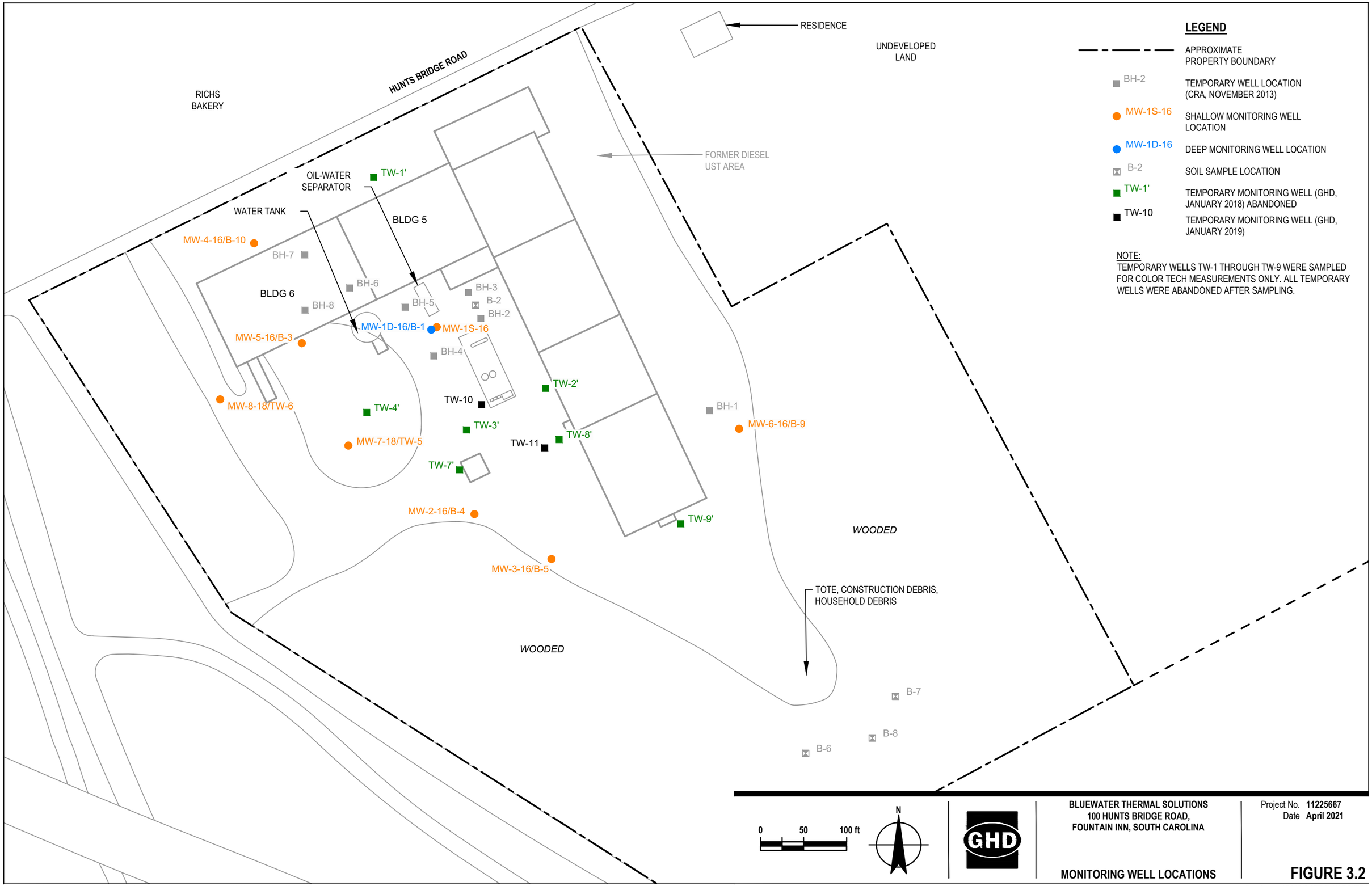
Data Source: ARCADIS SITE PLAN FIGURE 2



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BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

Project No. **11225667**
Date **April 2021**

MONITORING WELL LOCATIONS

FIGURE 3.2

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT015\11225667-GHD-0000-RPT-EN-0106_WA-015.dwg
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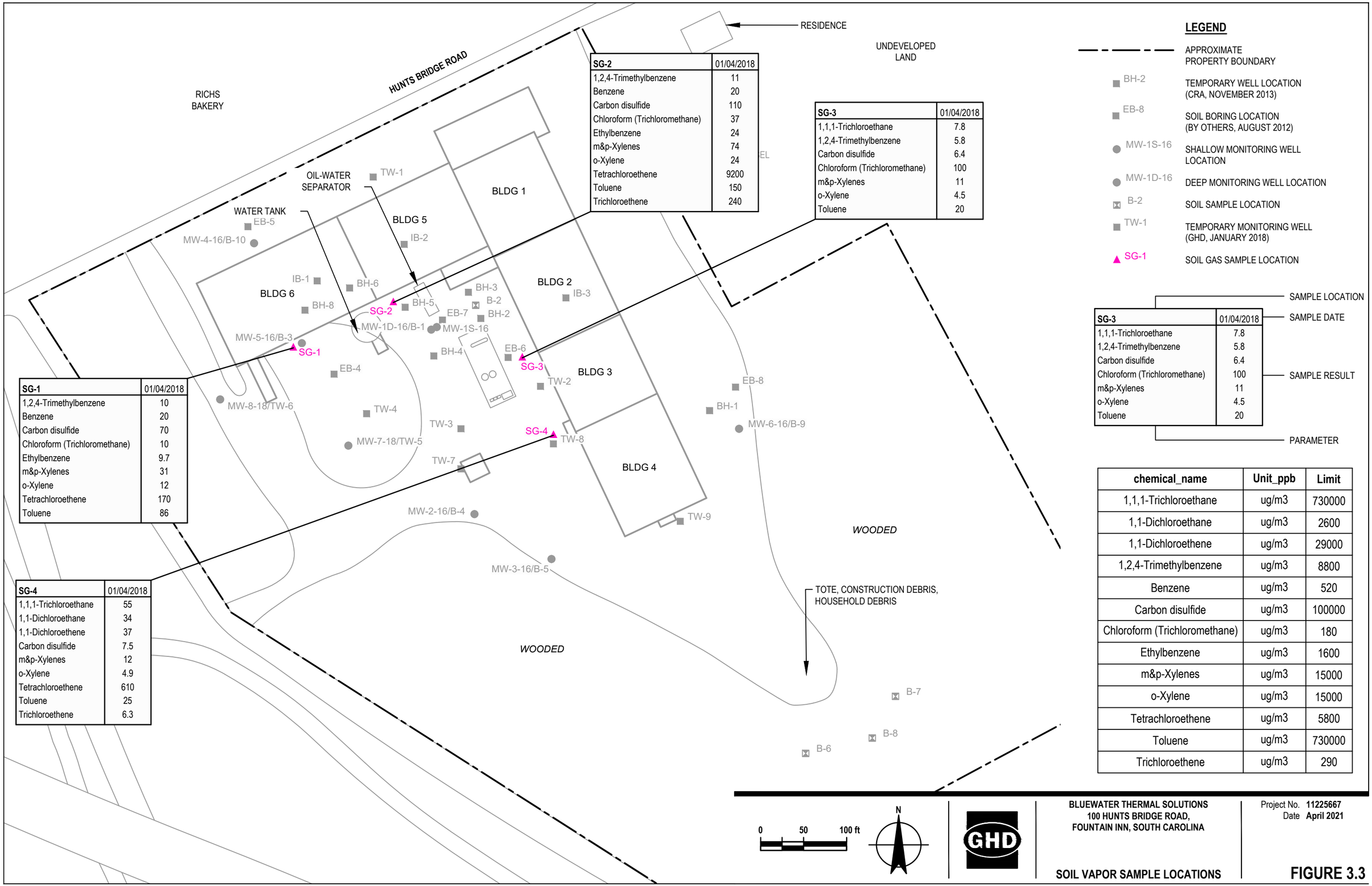

SG-1	01/04/2018
1,2,4-Trimethylbenzene	10
Benzene	20
Carbon disulfide	70
Chloroform (Trichloromethane)	10
Ethylbenzene	9.7
m&p-Xylenes	31
o-Xylene	12
Tetrachloroethene	170
Toluene	86

SG-2	01/04/2018
1,2,4-Trimethylbenzene	11
Benzene	20
Carbon disulfide	110
Chloroform (Trichloromethane)	37
Ethylbenzene	24
m&p-Xylenes	74
o-Xylene	24
Tetrachloroethene	9200
Toluene	150
Trichloroethene	240

SG-3	01/04/2018
1,1,1-Trichloroethane	7.8
1,2,4-Trimethylbenzene	5.8
Carbon disulfide	6.4
Chloroform (Trichloromethane)	100
m&p-Xylenes	11
o-Xylene	4.5
Toluene	20

SG-4	01/04/2018
1,1,1-Trichloroethane	55
1,1-Dichloroethane	34
1,1-Dichloroethene	37
Carbon disulfide	7.5
m&p-Xylenes	12
o-Xylene	4.9
Tetrachloroethene	610
Toluene	25
Trichloroethene	6.3

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- BH-2 — TEMPORARY WELL LOCATION (CRA, NOVEMBER 2013)
- EB-8 — SOIL BORING LOCATION (BY OTHERS, AUGUST 2012)
- MW-1S-16 — SHALLOW MONITORING WELL LOCATION
- MW-1D-16 — DEEP MONITORING WELL LOCATION
- B-2 — SOIL SAMPLE LOCATION
- TW-1 — TEMPORARY MONITORING WELL (GHD, JANUARY 2018)
- SG-1 — SOIL GAS SAMPLE LOCATION

SG-3	01/04/2018
1,1,1-Trichloroethane	7.8
1,2,4-Trimethylbenzene	5.8
Carbon disulfide	6.4
Chloroform (Trichloromethane)	100
m&p-Xylenes	11
o-Xylene	4.5
Toluene	20

SAMPLE LOCATION
SAMPLE DATE
SAMPLE RESULT
PARAMETER

chemical_name	Unit_ppb	Limit
1,1,1-Trichloroethane	ug/m3	730000
1,1-Dichloroethane	ug/m3	2600
1,1-Dichloroethene	ug/m3	29000
1,2,4-Trimethylbenzene	ug/m3	8800
Benzene	ug/m3	520
Carbon disulfide	ug/m3	100000
Chloroform (Trichloromethane)	ug/m3	180
Ethylbenzene	ug/m3	1600
m&p-Xylenes	ug/m3	15000
o-Xylene	ug/m3	15000
Tetrachloroethene	ug/m3	5800
Toluene	ug/m3	730000
Trichloroethene	ug/m3	290

BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

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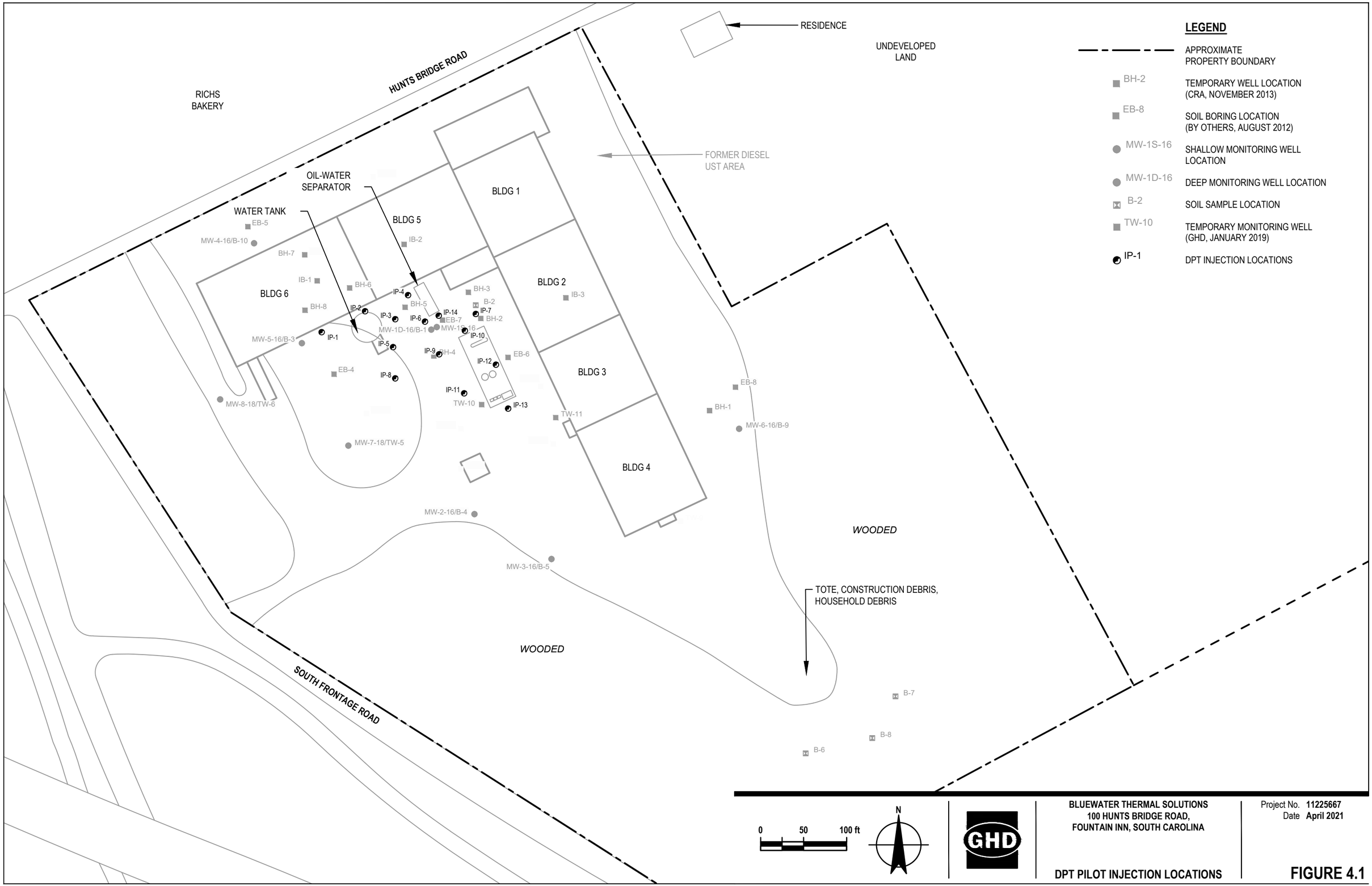
SOIL VAPOR SAMPLE LOCATIONS

FIGURE 3.3

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT015\11225667-GHD-0000-RPT-EN-0107_WA-015.dwg
Plot Date: 07 April 2021 12:22 PM

Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

Project No. **11225667**
Date **April 2021**

DPT PILOT INJECTION LOCATIONS

FIGURE 4.1

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT015\11225667-GHD-0000-RPT-EN-0108_WA-015.dwg
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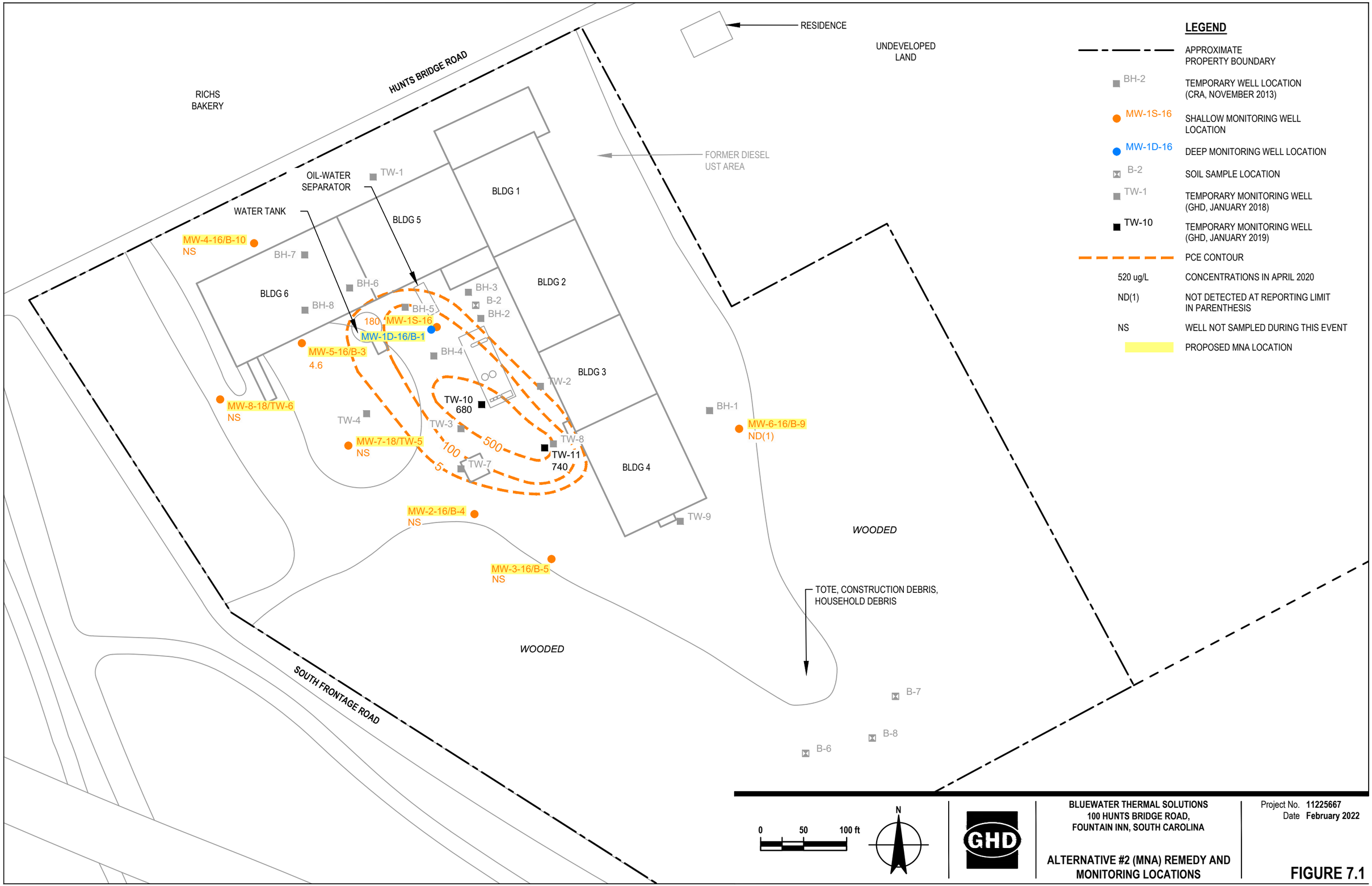
Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

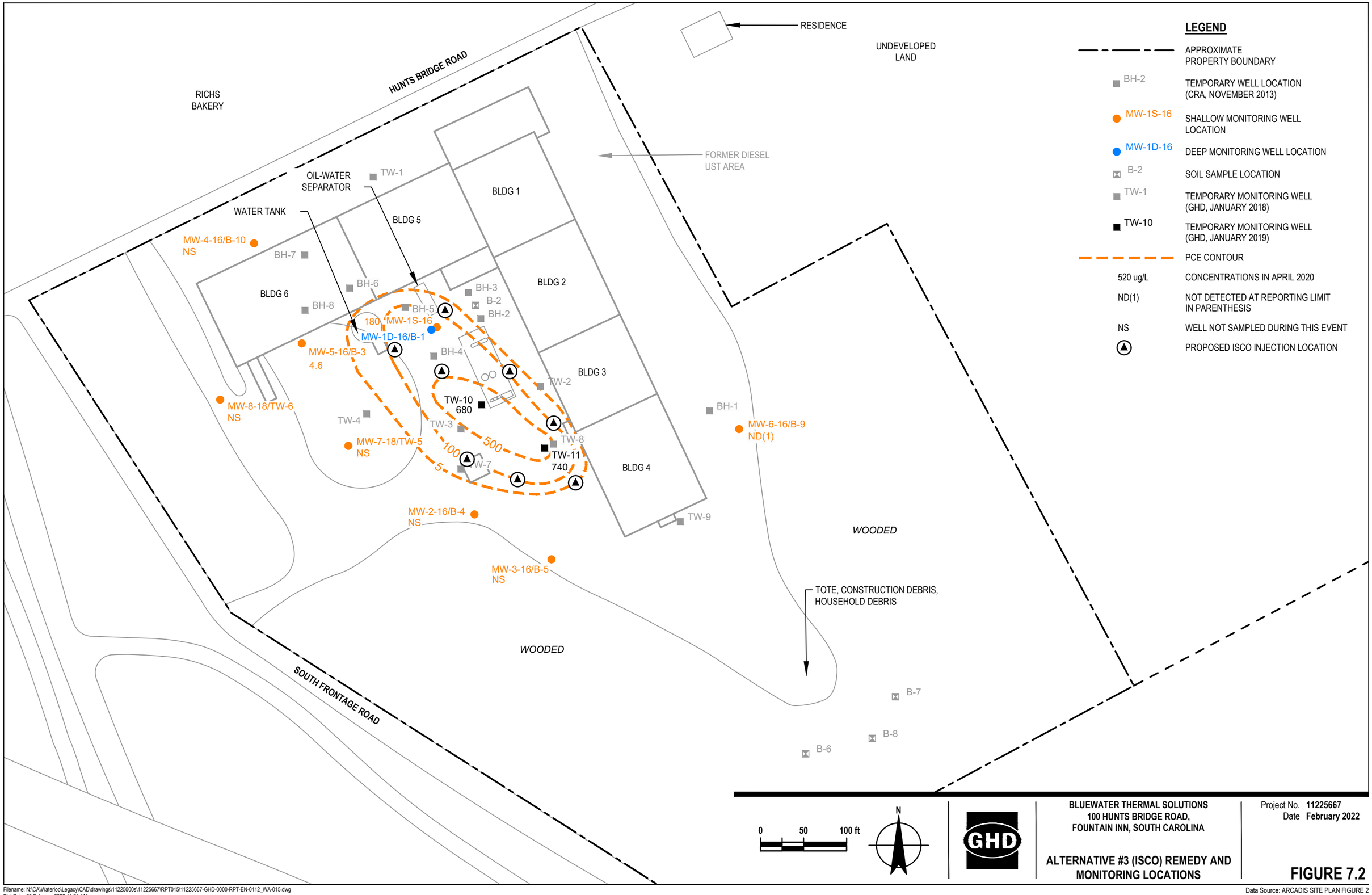
Project No. **11225667**
Date **February 2022**

ALTERNATIVE #2 (MNA) REMEDY AND MONITORING LOCATIONS

FIGURE 7.1

Filename: N:\CA\Waterloo\Legacy\CAD\drawings\11225000s\11225667\RPT015\11225667-GHD-0000-RPT-EN-0111_WA-015.dwg
Plot Date: 28 February 2022 11:21 AM

Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

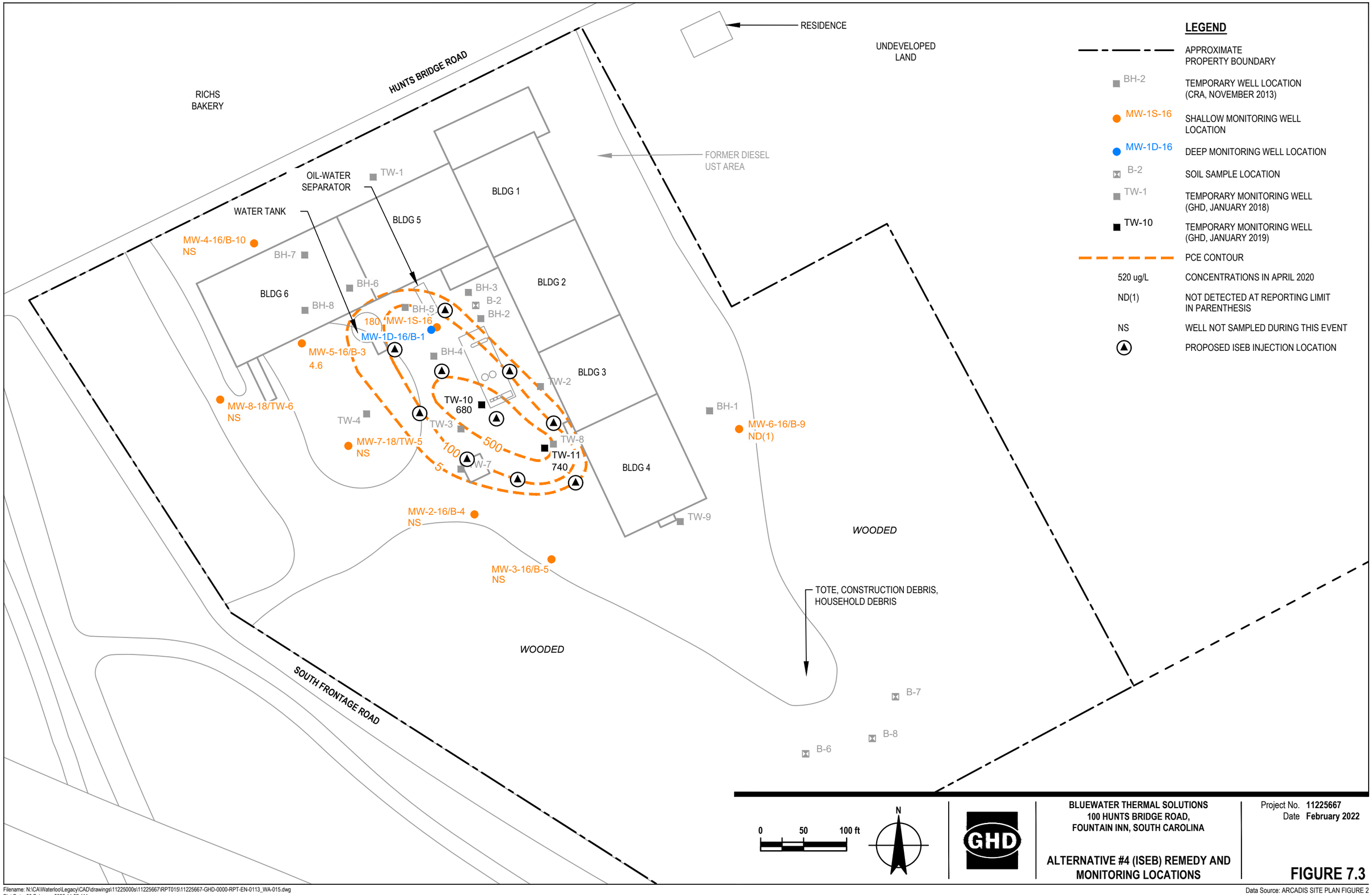
ALTERNATIVE #3 (ISCO) REMEDY AND MONITORING LOCATIONS

Project No. **11225667**
Date **February 2022**

FIGURE 7.2

Filename: N:\CA\Waterloo\Legacy\CAD\drawings\11225000s\11225667\RPT015\11225667-GHD-0000-RPT-EN-0112_WA-015.dwg
Plot Date: 28 February 2022 11:24 AM

Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

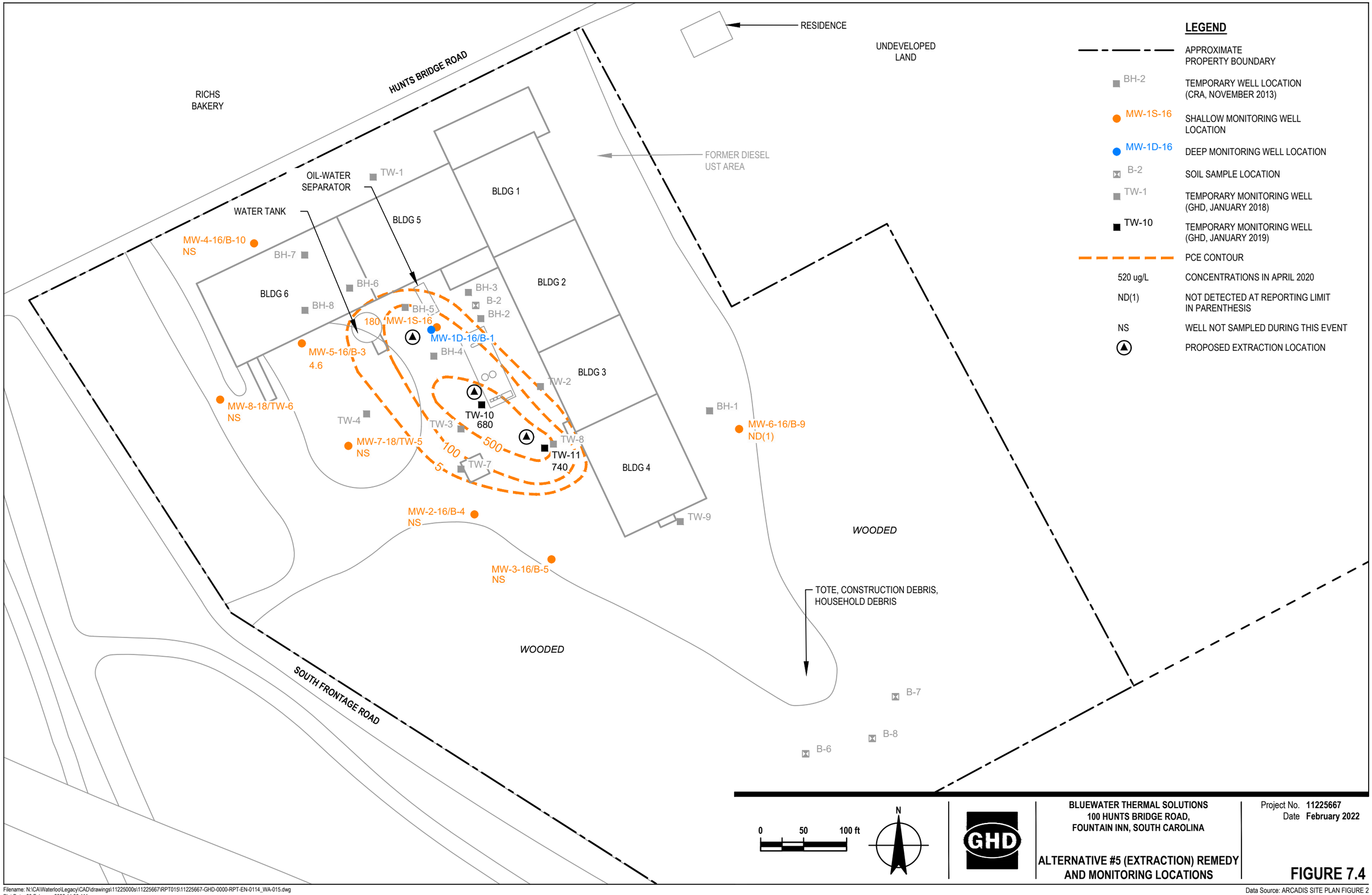
ALTERNATIVE #4 (ISEB) REMEDY AND MONITORING LOCATIONS

Project No. **11225667**
Date **February 2022**

FIGURE 7.3

Filename: N:\CA\Waterloo\Legacy\CAD\drawings\11225000s\11225667\RPT015\11225667-GHD-0000-RPT-EN-0113_WA-015.dwg
Plot Date: 28 February 2022 11:27 AM

Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

ALTERNATIVE #5 (EXTRACTION) REMEDY AND MONITORING LOCATIONS

Project No. **11225667**
Date **February 2022**

FIGURE 7.4

Filename: N:\CA\Waterloo\Legacy\CAD\drawings\11225000s\11225667\RPT015\11225667-GHD-0000-RPT-EN-0114_WA-015.dwg
Plot Date: 28 February 2022 11:30 AM

Data Source: ARCADIS SITE PLAN FIGURE 2

Tables

Table 3.1

Historical Soil Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			BH-2	BH-3	BH-4	BH-5	BH-5	BH-6	BH-7	BH-8
Sample ID:			SO-077150-110713-AWY-002	SO-077150-110713-AWY-003	SO-077150-110613-AWY-001	SO-077150-110713-AWY-004	SO-077150-110713-AWY-005	SO-077150-110713-AWY-007	SO-077150-110713-AWY-008	SO-077150-110713-AWY-009
Sample Date:			11/7/2013	11/7/2013	11/6/2013	11/7/2013	11/7/2013	11/7/2013	11/7/2013	11/7/2013
Sample Depth:		EPA RSL Industrial Soil	(12-14) ft BGS	(16-18) ft BGS	(14-16) ft BGS	(1-3) ft BGS	(18-20) ft BGS	(18-20) ft BGS	(18-20) ft BGS	(18-20) ft BGS
Parameters	**Units**									
VOCs										
1,1,1,2-Tetrachloroethane	ug/kg	8800	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	ug/kg	3600000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
1,1,2,2-Tetrachloroethane	ug/kg	2700	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
1,1,2-Trichloroethane	ug/kg	630	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
1,1-Dichloroethane	ug/kg	16000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
1,1-Dichloroethene	ug/kg	100000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
1,2,4-Trichlorobenzene	ug/kg	26000	4.7 U	4.6 U	4.4 U	1.7 J	4.3 U	4.4 U	4.2 U	4.3 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	64	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
1,2-Dibromoethane (Ethylene dibromide)	ug/kg	160	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
1,2-Dichlorobenzene	ug/kg	930000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
1,2-Dichloroethane	ug/kg	2000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
1,2-Dichloropropane	ug/kg	6600	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
1,3-Dichlorobenzene	ug/kg	NV	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
1,3-Dichloropropane	ug/kg	2300000	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	ug/kg	11000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/kg	19000000	47 U	46 U	44 U	35 U	43 U	44 U	42 U	43 U
2-Hexanone	ug/kg	130000	9.4 U	9.2 U	8.9 U	7.1 U	8.5 U	8.7 U	8.5 U	8.5 U
4-Methyl-2-pentanone (Methyl isobutyl ketone)	ug/kg	14000000	9.4 U	9.2 U	8.9 U	7.1 U	8.5 U	8.7 U	8.5 U	8.5 U
Acetone	ug/kg	67000000	6.7 J	92 U	5.3 J	22 J	85 U	6.5 J	85 U	5.3 J
Benzene	ug/kg	5100	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Bromodichloromethane	ug/kg	1300	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Bromoform	ug/kg	86000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Bromomethane (Methyl bromide)	ug/kg	3000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Carbon disulfide	ug/kg	350000	9.4 U	9.2 U	8.9 U	4.4 J	8.5 U	8.7 U	8.5 U	8.5 U
Carbon tetrachloride	ug/kg	2900	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Chlorobenzene	ug/kg	130000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Chlorobromomethane	ug/kg	63000	--	--	--	--	--	--	--	--
Chloroethane	ug/kg	5700000	9.4 U	9.2 U	8.9 U	7.1 U	8.5 U	8.7 U	8.5 U	8.5 U
Chloroform (Trichloromethane)	ug/kg	1400	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Chloromethane (Methyl chloride)	ug/kg	46000	9.4 U	9.2 U	8.9 U	7.1 U	8.5 U	8.7 U	8.5 U	8.5 U
cis-1,2-Dichloroethene	ug/kg	230000	4.7 U	4.6 U	4.4 U	5.7	4.3 U	4.4 U	4.2 U	4.3 U
cis-1,3-Dichloropropene	ug/kg	NV	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Cyclohexane	ug/kg	2700000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Dibromochloromethane	ug/kg	39000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Dichlorodifluoromethane (CFC-12)	ug/kg	37000	9.4 U	9.2 U	8.9 U	7.1 U	8.5 U	8.7 U	8.5 U	8.5 U
Ethylbenzene	ug/kg	25000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Isopropyl benzene	ug/kg	990000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Methyl acetate	ug/kg	120000000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Methyl cyclohexane	ug/kg	NV	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Methyl tert butyl ether (MTBE)	ug/kg	210000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Methylene chloride	ug/kg	320000	19 U	18 U	18 U	14 U	17 U	17 U	17 U	17 U
Styrene	ug/kg	3500000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Tetrachloroethene	ug/kg	39000	4.7 U	6.3	84	2.5 J	150	63	30	75
Toluene	ug/kg	4700000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
trans-1,2-Dichloroethene	ug/kg	2300000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
trans-1,3-Dichloropropene	ug/kg	NV	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Trichloroethene	ug/kg	1900	4.7 U	4.6 U	2.6 J	3.5 U	3.0 J	4.4 U	4.2 U	4.3 U
Trichlorofluoromethane (CFC-11)	ug/kg	35000000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U
Trifluorotrichloroethane (CFC-113)	ug/kg	2800000	9.4 U	9.2 U	8.9 U	7.1 U	8.5 U	8.7 U	8.5 U	8.5 U
Vinyl chloride	ug/kg	1700	9.4 U	9.2 U	8.9 U	7.1 U	8.5 U	8.7 U	8.5 U	8.5 U
Xylenes (total)	ug/kg	250000	4.7 U	4.6 U	4.4 U	3.5 U	4.3 U	4.4 U	4.2 U	4.3 U

Table 3.1

Historical Soil Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			BH-2	BH-3	BH-4	BH-5	BH-5	BH-6	BH-7	BH-8
Sample ID:			SO-077150-110713-AWY-002	SO-077150-110713-AWY-003	SO-077150-110613-AWY-001	SO-077150-110713-AWY-004	SO-077150-110713-AWY-005	SO-077150-110713-AWY-007	SO-077150-110713-AWY-008	SO-077150-110713-AWY-009
Sample Date:			11/7/2013	11/7/2013	11/6/2013	11/7/2013	11/7/2013	11/7/2013	11/7/2013	11/7/2013
Sample Depth:		EPA RSL Industrial Soil	(12-14) ft BGS	(16-18) ft BGS	(14-16) ft BGS	(1-3) ft BGS	(18-20) ft BGS	(18-20) ft BGS	(18-20) ft BGS	(18-20) ft BGS
Parameters	**Units**									
SVOCs										
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl)	ug/kg	4700000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
2,4,5-Trichlorophenol	ug/kg	8200000	2200 U	2200 U	2300 U	2200 U	2300 U	2100 U	2100 U	2200 U
2,4,6-Trichlorophenol	ug/kg	82000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
2,4-Dichlorophenol	ug/kg	250000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
2,4-Dimethylphenol	ug/kg	1600000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
2,4-Dinitrophenol	ug/kg	160000	2200 U	2200 U	2300 U	2200 U	2300 U	2100 U	2100 U	2200 U
2,4-Dinitrotoluene	ug/kg	7400	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
2,6-Dinitrotoluene	ug/kg	1500	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
2-Chloronaphthalene	ug/kg	6000000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
2-Chlorophenol	ug/kg	580000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
2-Methylnaphthalene	ug/kg	300000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
2-Methylphenol	ug/kg	4100000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
2-Nitroaniline	ug/kg	800000	2200 U	2200 U	2300 U	2200 U	2300 U	2100 U	2100 U	2200 U
2-Nitrophenol	ug/kg	NV	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
3,3'-Dichlorobenzidine	ug/kg	5100	860 U	880 U	910 U	870 U	900 U	840 U	830 U	850 U
3-Nitroaniline	ug/kg		2200 U	2200 U	2300 U	2200 U	2300 U	2100 U	2100 U	2200 U
4,6-Dinitro-2-methylphenol	ug/kg	6600	2200 U	2200 U	2300 U	2200 U	2300 U	2100 U	2100 U	2200 U
4-Bromophenyl phenyl ether	ug/kg	NV	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
4-Chloro-3-methylphenol	ug/kg	8200000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
4-Chloroaniline	ug/kg	11000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
4-Chlorophenyl phenyl ether	ug/kg	NV	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
4-Methylphenol	ug/kg	8200000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
4-Nitroaniline	ug/kg	110000	2200 U	2200 U	2300 U	2200 U	2300 U	2100 U	2100 U	2200 U
4-Nitrophenol	ug/kg	NV	2200 U	2200 U	2300 U	2200 U	2300 U	2100 U	2100 U	2200 U
Acenaphthene	ug/kg	4500000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Acenaphthylene	ug/kg	NV	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Acetophenone	ug/kg	12000000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Anthracene	ug/kg	23000000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Atrazine	ug/kg	10000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Benzaldehyde	ug/kg	820000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Benzo(a)anthracene	ug/kg	21000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Benzo(a)pyrene	ug/kg	2100	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Benzo(b)fluoranthene	ug/kg	21000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Benzo(g,h,i)perylene	ug/kg	NV	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Benzo(k)fluoranthene	ug/kg	210000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Biphenyl (1,1-Biphenyl)	ug/kg	20000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
bis(2-Chloroethoxy)methane	ug/kg	250000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
bis(2-Chloroethyl)ether	ug/kg	1000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/kg	160000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Butyl benzylphthalate (BBP)	ug/kg	1200000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Caprolactam	ug/kg	40000000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Carbazole	ug/kg	NV	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Chrysene	ug/kg	2100000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Dibenz(a,h)anthracene	ug/kg	2100	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Dibenzofuran	ug/kg	100000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Diethyl phthalate	ug/kg	66000000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Dimethyl phthalate	ug/kg	NV	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Di-n-butylphthalate (DBP)	ug/kg	8200000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Di-n-octyl phthalate (DnOP)	ug/kg	820000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Fluoranthene	ug/kg	3000000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Fluorene	ug/kg	3000000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Hexachlorobenzene	ug/kg	960	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Hexachlorobutadiene	ug/kg	5300	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Hexachlorocyclopentadiene	ug/kg	750	850 U	870 U	900 U	860 U	880 U	830 U	810 U	840 U

Table 3.1

Historical Soil Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			BH-2	BH-3	BH-4	BH-5	BH-5	BH-6	BH-7	BH-8
Sample ID:			SO-077150-110713-AWY-002	SO-077150-110713-AWY-003	SO-077150-110613-AWY-001	SO-077150-110713-AWY-004	SO-077150-110713-AWY-005	SO-077150-110713-AWY-007	SO-077150-110713-AWY-008	SO-077150-110713-AWY-009
Sample Date:			11/7/2013	11/7/2013	11/6/2013	11/7/2013	11/7/2013	11/7/2013	11/7/2013	11/7/2013
Sample Depth:		EPA RSL Industrial Soil	(12-14) ft BGS	(16-18) ft BGS	(14-16) ft BGS	(1-3) ft BGS	(18-20) ft BGS	(18-20) ft BGS	(18-20) ft BGS	(18-20) ft BGS
Parameters	**Units**									
Hexachloroethane	ug/kg	8000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Indeno(1,2,3-cd)pyrene	ug/kg	21000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Isophorone	ug/kg	2400000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Naphthalene	ug/kg	17000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Nitrobenzene	ug/kg	22000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
N-Nitrosodi-n-propylamine	ug/kg	330	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
N-Nitrosodiphenylamine	ug/kg	470000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Pentachlorophenol	ug/kg	4000	2200 U	2200 U	2300 U	2200 U	2300 U	2100 U	2100 U	2200 U
Phenanthrene	ug/kg	NV	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Phenol	ug/kg	25000000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Pyrene	ug/kg	2300000	420 U	430 U	450 U	430 U	440 U	410 U	410 U	420 U
Metals										
Aluminum	ug/kg	110000000	--	--	--	--	--	--	--	--
Antimony	ug/kg	47000	--	--	--	--	--	--	--	--
Arsenic	ug/kg	3000	6240 U	6130 U	6690 U	2210 J	6240 U	--	--	--
Barium	ug/kg	22000000	57400	27600	33400	33400	7230	--	--	--
Beryllium	ug/kg	230000	--	--	--	--	--	--	--	--
Cadmium	ug/kg	98000	78.7 J	3060 U	3340 U	3030 U	3120 U	--	--	--
Chromium	ug/kg	NV	3120 U	3060 U	2660 J	20600	3120 U	--	--	--
Cobalt	ug/kg	35000	--	--	--	--	--	--	--	--
Copper	ug/kg	4700000	--	--	--	--	--	--	--	--
Iron	ug/kg	82000000	--	--	--	--	--	--	--	--
Lead	ug/kg	800000	62100	54200	34900	15000	12900	--	--	--
Magnesium	ug/kg	NV	--	--	--	--	--	--	--	--
Manganese	ug/kg	2600000	--	--	--	--	--	--	--	--
Mercury	ug/kg	4600	127 U	132 U	136 U	26.2 J	133 U	--	--	--
Nickel	ug/kg	2200000	--	--	--	--	--	--	--	--
Potassium	ug/kg	NV	--	--	--	--	--	--	--	--
Selenium	ug/kg	580000	376 J	173 J	6690 U	6070 U	6240 U	--	--	--
Silver	ug/kg	580000	66.2 J	37.3 J	3340 U	109 J	3120 U	--	--	--
Sodium	ug/kg	NV	--	--	--	--	--	--	--	--
Thallium	ug/kg	1200	--	--	--	--	--	--	--	--
Vanadium	ug/kg	580000	--	--	--	--	--	--	--	--
Zinc	ug/kg	35000000	--	--	--	--	--	--	--	--

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
EPA RSL - Screening criteria for industrial soils (THQ 0.1)
NV - No RSL value established for screening
"--" - Compound not analyzed
2370 - Bold values exceed the screening criteria

Table 3.1

Historical Soil Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			B-2	B-2	B-6	B-6	B-7	B-7	B-8	B-8
Sample ID:			SO-077150-101116-DJB-003	SO-077150-101116-DJB-004	SO-077150-101216-DJB-011	SO-077150-101216-DJB-012	SO-077150-101216-DJB-013	SO-077150-101216-DJB-014	SO-077150-101216-DJB-015	SO-077150-101216-DJB-016
Sample Date:			10/11/2016	10/11/2016	10/12/2016	10/12/2016	10/12/2016	10/12/2016	10/12/2016	10/12/2016
Sample Depth:		EPA RSL Industrial Soil	(0.5-1.5) ft BGS	(14-15) ft BGS	(0.5-1.5) ft BGS	(8-9) ft BGS	(0.5-1.5) ft BGS	(9-10) ft BGS	(0.5-1.5) ft BGS	(9-10) ft BGS
Parameters	**Units**									
VOCs										
1,1,1,2-Tetrachloroethane	ug/kg	8800	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
1,1,1-Trichloroethane	ug/kg	3600000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
1,1,2,2-Tetrachloroethane	ug/kg	2700	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	ug/kg	630	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
1,1-Dichloroethane	ug/kg	16000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
1,1-Dichloroethene	ug/kg	100000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
1,2,4-Trichlorobenzene	ug/kg	26000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	64	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
1,2-Dibromoethane (Ethylene dibromide)	ug/kg	160	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
1,2-Dichlorobenzene	ug/kg	930000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
1,2-Dichloroethane	ug/kg	2000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
1,2-Dichloropropane	ug/kg	6600	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
1,3-Dichlorobenzene	ug/kg	NV	--	--	--	--	--	--	--	--
1,3-Dichloropropane	ug/kg	2300000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
1,4-Dichlorobenzene	ug/kg	11000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/kg	19000000	38	10 U	8.6 U	7.5 U	6.5 U	9.7 U	7.2 U	6.3 U
2-Hexanone	ug/kg	130000	11 U	10 U	8.6 U	7.5 U	6.5 U	9.7 U	7.2 U	6.3 U
4-Methyl-2-pentanone (Methyl isobutyl ketone)	ug/kg	14000000	11 U	10 U	8.6 U	7.5 U	6.5 U	9.7 U	7.2 U	6.3 U
Acetone	ug/kg	67000000	220	8.2 J	8.6 U	7.5 U	6.5 U	9.7 U	7.2 U	6.3 U
Benzene	ug/kg	5100	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Bromodichloromethane	ug/kg	1300	--	--	--	--	--	--	--	--
Bromoform	ug/kg	86000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Bromomethane (Methyl bromide)	ug/kg	3000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Carbon disulfide	ug/kg	350000	11 U	10 U	8.6 U	7.5 U	6.5 U	9.7 U	7.2 U	6.3 U
Carbon tetrachloride	ug/kg	2900	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Chlorobenzene	ug/kg	130000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Chlorobromomethane	ug/kg	63000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Chloroethane	ug/kg	5700000	11 U	10 U	8.6 U	7.5 U	6.5 U	9.7 U	7.2 U	6.3 U
Chloroform (Trichloromethane)	ug/kg	1400	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Chloromethane (Methyl chloride)	ug/kg	46000	11 U	10 U	8.6 U	7.5 U	6.5 U	9.7 U	7.2 U	6.3 U
cis-1,2-Dichloroethene	ug/kg	230000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
cis-1,3-Dichloropropene	ug/kg	NV	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Cyclohexane	ug/kg	2700000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Dibromochloromethane	ug/kg	39000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Dichlorodifluoromethane (CFC-12)	ug/kg	37000	11 U	10 U	8.6 U	7.5 U	6.5 U	9.7 U	7.2 U	6.3 U
Ethylbenzene	ug/kg	25000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Isopropyl benzene	ug/kg	990000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Methyl acetate	ug/kg	120000000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Methyl cyclohexane	ug/kg	NV	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Methyl tert butyl ether (MTBE)	ug/kg	210000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Methylene chloride	ug/kg	320000	11 U	10 U	8.6 U	7.5 U	6.5 U	9.7 U	7.2 U	6.3 U
Styrene	ug/kg	3500000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Tetrachloroethene	ug/kg	39000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Toluene	ug/kg	4700000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
trans-1,2-Dichloroethene	ug/kg	2300000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
trans-1,3-Dichloropropene	ug/kg	NV	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Trichloroethene	ug/kg	1900	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Trichlorofluoromethane (CFC-11)	ug/kg	35000000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U
Trifluorotrichloroethane (CFC-113)	ug/kg	2800000	11 U	10 U	8.6 U	7.5 U	6.5 U	9.7 U	7.2 U	6.3 U
Vinyl chloride	ug/kg	1700	11 U	10 U	8.6 U	7.5 U	6.5 U	9.7 U	7.2 U	6.3 U
Xylenes (total)	ug/kg	250000	5.3 U	5.2 U	4.3 U	3.8 U	3.2 U	4.8 U	3.6 U	3.2 U

Table 3.1

Historical Soil Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			B-2	B-2	B-6	B-6	B-7	B-7	B-8	B-8
Sample ID:			SO-077150-101116-DJB-003	SO-077150-101116-DJB-004	SO-077150-101216-DJB-011	SO-077150-101216-DJB-012	SO-077150-101216-DJB-013	SO-077150-101216-DJB-014	SO-077150-101216-DJB-015	SO-077150-101216-DJB-016
Sample Date:			10/11/2016	10/11/2016	10/12/2016	10/12/2016	10/12/2016	10/12/2016	10/12/2016	10/12/2016
Sample Depth:		EPA RSL Industrial Soil	(0.5-1.5) ft BGS	(14-15) ft BGS	(0.5-1.5) ft BGS	(8-9) ft BGS	(0.5-1.5) ft BGS	(9-10) ft BGS	(0.5-1.5) ft BGS	(9-10) ft BGS
Parameters	**Units**									
SVOCs										
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl)	ug/kg	4700000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
2,4,5-Trichlorophenol	ug/kg	8200000	1100 U	1100 U	1000 U	1100 U	990 U	1000 U	890 U	1100 U
2,4,6-Trichlorophenol	ug/kg	82000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
2,4-Dichlorophenol	ug/kg	250000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
2,4-Dimethylphenol	ug/kg	1600000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
2,4-Dinitrophenol	ug/kg	160000	1100 U	1100 U	1000 U	1100 U	990 U	1000 U	890 U	1100 U
2,4-Dinitrotoluene	ug/kg	7400	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
2,6-Dinitrotoluene	ug/kg	1500	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
2-Chloronaphthalene	ug/kg	6000000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
2-Chlorophenol	ug/kg	580000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
2-Methylnaphthalene	ug/kg	300000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
2-Methylphenol	ug/kg	4100000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
2-Nitroaniline	ug/kg	800000	1100 U	1100 U	1000 U	1100 U	990 U	1000 U	890 U	1100 U
2-Nitrophenol	ug/kg	NV	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
3,3'-Dichlorobenzidine	ug/kg	5100	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
3-Nitroaniline	ug/kg		1100 U	1100 U	1000 U	1100 U	990 U	1000 U	890 U	1100 U
4,6-Dinitro-2-methylphenol	ug/kg	6600	1100 U	1100 U	1000 U	1100 U	990 U	1000 U	890 U	1100 U
4-Bromophenyl phenyl ether	ug/kg	NV	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
4-Chloro-3-methylphenol	ug/kg	8200000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
4-Chloroaniline	ug/kg	11000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
4-Chlorophenyl phenyl ether	ug/kg	NV	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
4-Methylphenol	ug/kg	8200000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
4-Nitroaniline	ug/kg	110000	1100 U	1100 U	1000 U	1100 U	990 U	1000 U	890 U	1100 U
4-Nitrophenol	ug/kg	NV	1100 U	1100 U	1000 U	1100 U	990 U	1000 U	890 U	1100 U
Acenaphthene	ug/kg	4500000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Acenaphthylene	ug/kg	NV	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Acetophenone	ug/kg	12000000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Anthracene	ug/kg	23000000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Atrazine	ug/kg	10000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Benzaldehyde	ug/kg	820000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Benzo(a)anthracene	ug/kg	21000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Benzo(a)pyrene	ug/kg	2100	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Benzo(b)fluoranthene	ug/kg	21000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Benzo(g,h,i)perylene	ug/kg	NV	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Benzo(k)fluoranthene	ug/kg	210000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Biphenyl (1,1-Biphenyl)	ug/kg	20000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
bis(2-Chloroethoxy)methane	ug/kg	250000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
bis(2-Chloroethyl)ether	ug/kg	1000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/kg	160000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Butyl benzylphthalate (BBP)	ug/kg	1200000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Caprolactam	ug/kg	40000000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Carbazole	ug/kg	NV	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Chrysene	ug/kg	2100000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Dibenz(a,h)anthracene	ug/kg	2100	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Dibenzofuran	ug/kg	100000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Diethyl phthalate	ug/kg	66000000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Dimethyl phthalate	ug/kg	NV	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Di-n-butylphthalate (DBP)	ug/kg	8200000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Di-n-octyl phthalate (DnOP)	ug/kg	820000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Fluoranthene	ug/kg	3000000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Fluorene	ug/kg	3000000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Hexachlorobenzene	ug/kg	960	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Hexachlorobutadiene	ug/kg	5300	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Hexachlorocyclopentadiene	ug/kg	750	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U

Table 3.1

Historical Soil Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			B-2	B-2	B-6	B-6	B-7	B-7	B-8	B-8
Sample ID:			SO-077150-101116-DJB-003	SO-077150-101116-DJB-004	SO-077150-101216-DJB-011	SO-077150-101216-DJB-012	SO-077150-101216-DJB-013	SO-077150-101216-DJB-014	SO-077150-101216-DJB-015	SO-077150-101216-DJB-016
Sample Date:			10/11/2016	10/11/2016	10/12/2016	10/12/2016	10/12/2016	10/12/2016	10/12/2016	10/12/2016
Sample Depth:		EPA RSL Industrial Soil	(0.5-1.5) ft BGS	(14-15) ft BGS	(0.5-1.5) ft BGS	(8-9) ft BGS	(0.5-1.5) ft BGS	(9-10) ft BGS	(0.5-1.5) ft BGS	(9-10) ft BGS
Parameters	**Units**									
Hexachloroethane	ug/kg	8000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Indeno(1,2,3-cd)pyrene	ug/kg	21000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Isophorone	ug/kg	2400000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Naphthalene	ug/kg	17000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Nitrobenzene	ug/kg	22000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
N-Nitrosodi-n-propylamine	ug/kg	330	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
N-Nitrosodiphenylamine	ug/kg	470000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Pentachlorophenol	ug/kg	4000	1100 U	1100 U	1000 U	1100 U	990 U	1000 U	890 U	1100 U
Phenanthrene	ug/kg	NV	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Phenol	ug/kg	25000000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Pyrene	ug/kg	2300000	450 U	440 U	420 U	420 U	390 U	410 U	350 U	420 U
Metals										
Aluminum	ug/kg	110000000	18800000	9850000	9680000	17000000	4100000	5170000	4370000	5540000
Antimony	ug/kg	47000	514 J	6490 UJ	5620 UJ	339 J	5650 UJ	4380 UJ	4170 UJ	5990 UJ
Arsenic	ug/kg	3000	1990	1300 U	1120 U	587 J	1130 U	876 U	833 U	231 J
Barium	ug/kg	22000000	43900	26700	12600	25700	4910 J	4970	3720 J	15200
Beryllium	ug/kg	230000	314 J	464 J	228 J	417 J	147 J	177 J	27.7 J	333 J
Cadmium	ug/kg	98000	602 U	649 U	562 U	607 U	565 U	438 U	417 U	599 U
Chromium	ug/kg	NV	11100	3450	2450	2820	3540	995	2810	1100 J
Cobalt	ug/kg	35000	1090 J	2320 J	899 J	9060	813 J	368 J	78.2 J	1110 J
Copper	ug/kg	4700000	3000 J	1820 J	5190	15000	650 J	651 J	367 J	1090 J
Iron	ug/kg	82000000	14000000	12400000	4850000	14200000	13300000	2060000	443000	6640000
Lead	ug/kg	800000	13300	35500	18700	56500	11000	8480	6090	19100
Magnesium	ug/kg	NV	110000	981000	912000	944000	54400 J	233000	23300 J	374000
Manganese	ug/kg	2600000	6210	138000	27100	369000	2190	8290	1480	66700
Mercury	ug/kg	4600	14.3 J	127 U	8.45 J	23.2 J	112 U	125 U	103 U	108 U
Nickel	ug/kg	2200000	1080 J	528 J	643 J	2350 J	198 J	186 J	479 J	208 J
Potassium	ug/kg	NV	152000	1200000	1160000	1500000	191000	372000	114000	539000
Selenium	ug/kg	580000	602 U	649 U	562 U	607 U	565 U	438 U	417 U	599 U
Silver	ug/kg	580000	1200 U	1300 U	1120 U	1210 U	1130 U	876 U	833 U	1200 U
Sodium	ug/kg	NV	33600 J	51100 J	42200 J	68800 J	47000 J	25300 J	15500 J	20700 J
Thallium	ug/kg	1200	1200 U	**2370**	250 J	1210 U	1130 U	290 J	245 J	1200 U
Vanadium	ug/kg	580000	21900 J	17700 J	7390 J	11500 J	1090 J	1630 J	1740 J	2110 J
Zinc	ug/kg	35000000	18400	28100	15300	21000	2070 J	6370	1710	10000

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
EPA RSL - Screening criteria for industrial soils (THQ 0.1)
NV - No RSL value established for screening
"--" - Compound not analyzed
2370 - Bold values exceed the screening criteria

Table 3.1

Historical Soil Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			MW-1D	MW-1D	MW-2_2016	MW-2_2016	MW-4_2016	MW-4_2016	MW-5_2016	MW-5_2016
Sample ID:			SO-077150-101116-DJB-001	SO-077150-101116-DJB-002	SO-077150-101116-DJB-007	SO-077150-101116-DJB-008	SO-077150-101216-DJB-020	SO-077150-101216-DJB-021	SO-077150-101116-DJB-005	SO-077150-101116-DJB-006
Sample Date:			10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/12/2016	10/12/2016	10/11/2016	10/11/2016
Sample Depth:			(0.6-1.5) ft BGS	(15-15.5) ft BGS	(3-5) ft BGS	(9-10) ft BGS	(0-1.2) ft BGS	(18-20) ft BGS	(0.5-1.5) ft BGS	(14-15) ft BGS
Parameters	**Units**	**EPA RSL Industrial Soil**								
VOCs										
1,1,1,2-Tetrachloroethane	ug/kg	8800	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
1,1,1-Trichloroethane	ug/kg	3600000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
1,1,2,2-Tetrachloroethane	ug/kg	2700	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	ug/kg	630	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
1,1-Dichloroethane	ug/kg	16000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
1,1-Dichloroethene	ug/kg	100000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
1,2,4-Trichlorobenzene	ug/kg	26000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	64	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
1,2-Dibromoethane (Ethylene dibromide)	ug/kg	160	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
1,2-Dichlorobenzene	ug/kg	930000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
1,2-Dichloroethane	ug/kg	2000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
1,2-Dichloropropane	ug/kg	6600	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
1,3-Dichlorobenzene	ug/kg	NV	--	--	--	--	--	--	--	--
1,3-Dichloropropane	ug/kg	2300000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
1,4-Dichlorobenzene	ug/kg	11000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/kg	19000000	7.6 U	7.9 U	11 U	10 U	8.2 U	7.2 U	8.7 U	8.5 U
2-Hexanone	ug/kg	130000	7.6 U	7.9 U	11 U	10 U	8.2 U	7.2 U	8.7 U	8.5 U
4-Methyl-2-pentanone (Methyl isobutyl ketone)	ug/kg	14000000	7.6 U	7.9 U	11 U	10 U	8.2 U	7.2 U	8.7 U	8.5 U
Acetone	ug/kg	67000000	20	7.9 U	47	10 U	150	7.2 U	44	8.5 U
Benzene	ug/kg	5100	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Bromodichloromethane	ug/kg	1300	--	--	--	--	--	--	--	--
Bromoform	ug/kg	86000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Bromomethane (Methyl bromide)	ug/kg	3000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Carbon disulfide	ug/kg	350000	7.6 U	7.9 U	11 U	10 U	8.2 U	7.2 U	8.7 U	8.5 U
Carbon tetrachloride	ug/kg	2900	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Chlorobenzene	ug/kg	130000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Chlorobromomethane	ug/kg	63000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Chloroethane	ug/kg	5700000	7.6 U	7.9 U	11 U	10 U	8.2 U	7.2 U	8.7 U	8.5 U
Chloroform (Trichloromethane)	ug/kg	1400	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Chloromethane (Methyl chloride)	ug/kg	46000	7.6 U	7.9 U	11 U	10 U	8.2 U	7.2 U	8.7 U	8.5 U
cis-1,2-Dichloroethene	ug/kg	230000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
cis-1,3-Dichloropropene	ug/kg	NV	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Cyclohexane	ug/kg	2700000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Dibromochloromethane	ug/kg	39000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Dichlorodifluoromethane (CFC-12)	ug/kg	37000	7.6 U	7.9 U	11 U	10 U	8.2 U	7.2 U	8.7 U	8.5 U
Ethylbenzene	ug/kg	25000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Isopropyl benzene	ug/kg	990000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Methyl acetate	ug/kg	120000000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Methyl cyclohexane	ug/kg	NV	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Methyl tert butyl ether (MTBE)	ug/kg	210000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Methylene chloride	ug/kg	320000	7.6 U	7.9 U	11 U	10 U	8.2 U	7.2 U	8.7 U	8.5 U
Styrene	ug/kg	3500000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Tetrachloroethene	ug/kg	39000	3.8 U	30	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	2.4 J
Toluene	ug/kg	4700000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
trans-1,2-Dichloroethene	ug/kg	2300000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
trans-1,3-Dichloropropene	ug/kg	NV	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Trichloroethene	ug/kg	1900	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Trichlorofluoromethane (CFC-11)	ug/kg	35000000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U
Trifluorotrichloroethane (CFC-113)	ug/kg	2800000	7.6 U	7.9 U	11 U	10 U	8.2 U	7.2 U	8.7 U	8.5 U
Vinyl chloride	ug/kg	1700	7.6 U	7.9 U	11 U	10 U	8.2 U	7.2 U	8.7 U	8.5 U
Xylenes (total)	ug/kg	250000	3.8 U	3.9 U	5.5 U	5.1 U	4.1 U	3.6 U	4.4 U	4.3 U

Table 3.1

Historical Soil Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			MW-1D	MW-1D	MW-2_2016	MW-2_2016	MW-4_2016	MW-4_2016	MW-5_2016	MW-5_2016
Sample ID:			SO-077150-101116-DJB-001	SO-077150-101116-DJB-002	SO-077150-101116-DJB-007	SO-077150-101116-DJB-008	SO-077150-101216-DJB-020	SO-077150-101216-DJB-021	SO-077150-101116-DJB-005	SO-077150-101116-DJB-006
Sample Date:			10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/12/2016	10/12/2016	10/11/2016	10/11/2016
Sample Depth:		EPA RSL Industrial Soil	(0.6-1.5) ft BGS	(15-15.5) ft BGS	(3-5) ft BGS	(9-10) ft BGS	(0-1.2) ft BGS	(18-20) ft BGS	(0.5-1.5) ft BGS	(14-15) ft BGS
Parameters	**Units**									
SVOCs										
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl)	ug/kg	4700000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
2,4,5-Trichlorophenol	ug/kg	8200000	1000 U	1100 U	1000 U	1000 U	900 U	1000 U	940 U	1100 U
2,4,6-Trichlorophenol	ug/kg	82000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
2,4-Dichlorophenol	ug/kg	250000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
2,4-Dimethylphenol	ug/kg	1600000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
2,4-Dinitrophenol	ug/kg	160000	1000 U	1100 U	1000 U	1000 U	900 U	1000 U	940 U	1100 U
2,4-Dinitrotoluene	ug/kg	7400	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
2,6-Dinitrotoluene	ug/kg	1500	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
2-Chloronaphthalene	ug/kg	6000000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
2-Chlorophenol	ug/kg	580000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
2-Methylnaphthalene	ug/kg	300000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
2-Methylphenol	ug/kg	4100000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
2-Nitroaniline	ug/kg	800000	1000 U	1100 U	1000 U	1000 U	900 U	1000 U	940 U	1100 U
2-Nitrophenol	ug/kg	NV	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
3,3'-Dichlorobenzidine	ug/kg	5100	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
3-Nitroaniline	ug/kg		1000 U	1100 U	1000 U	1000 U	900 U	1000 U	940 U	1100 U
4,6-Dinitro-2-methylphenol	ug/kg	6600	1000 U	1100 U	1000 U	1000 U	900 U	1000 U	940 U	1100 U
4-Bromophenyl phenyl ether	ug/kg	NV	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
4-Chloro-3-methylphenol	ug/kg	8200000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
4-Chloroaniline	ug/kg	11000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
4-Chlorophenyl phenyl ether	ug/kg	NV	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
4-Methylphenol	ug/kg	8200000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
4-Nitroaniline	ug/kg	110000	1000 U	1100 U	1000 U	1000 U	900 U	1000 U	940 U	1100 U
4-Nitrophenol	ug/kg	NV	1000 U	1100 U	1000 U	1000 U	900 U	1000 U	940 U	1100 U
Acenaphthene	ug/kg	4500000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Acenaphthylene	ug/kg	NV	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Acetophenone	ug/kg	12000000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Anthracene	ug/kg	23000000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Atrazine	ug/kg	10000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Benzaldehyde	ug/kg	820000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Benzo(a)anthracene	ug/kg	21000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Benzo(a)pyrene	ug/kg	2100	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Benzo(b)fluoranthene	ug/kg	21000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Benzo(g,h,i)perylene	ug/kg	NV	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Benzo(k)fluoranthene	ug/kg	210000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Biphenyl (1,1-Biphenyl)	ug/kg	20000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
bis(2-Chloroethoxy)methane	ug/kg	250000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
bis(2-Chloroethyl)ether	ug/kg	1000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/kg	160000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Butyl benzylphthalate (BBP)	ug/kg	1200000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Caprolactam	ug/kg	40000000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Carbazole	ug/kg	NV	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Chrysene	ug/kg	2100000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Dibenz(a,h)anthracene	ug/kg	2100	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Dibenzofuran	ug/kg	100000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Diethyl phthalate	ug/kg	66000000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Dimethyl phthalate	ug/kg	NV	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Di-n-butylphthalate (DBP)	ug/kg	8200000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Di-n-octyl phthalate (DnOP)	ug/kg	820000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Fluoranthene	ug/kg	3000000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Fluorene	ug/kg	3000000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Hexachlorobenzene	ug/kg	960	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Hexachlorobutadiene	ug/kg	5300	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Hexachlorocyclopentadiene	ug/kg	750	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U

Table 3.1

Historical Soil Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			MW-1D	MW-1D	MW-2_2016	MW-2_2016	MW-4_2016	MW-4_2016	MW-5_2016	MW-5_2016
Sample ID:			SO-077150-101116-DJB-001	SO-077150-101116-DJB-002	SO-077150-101116-DJB-007	SO-077150-101116-DJB-008	SO-077150-101216-DJB-020	SO-077150-101216-DJB-021	SO-077150-101116-DJB-005	SO-077150-101116-DJB-006
Sample Date:			10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/12/2016	10/12/2016	10/11/2016	10/11/2016
Sample Depth:		EPA RSL Industrial Soil	(0.6-1.5) ft BGS	(15-15.5) ft BGS	(3-5) ft BGS	(9-10) ft BGS	(0-1.2) ft BGS	(18-20) ft BGS	(0.5-1.5) ft BGS	(14-15) ft BGS
Parameters	**Units**									
Hexachloroethane	ug/kg	8000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Indeno(1,2,3-cd)pyrene	ug/kg	21000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Isophorone	ug/kg	2400000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Naphthalene	ug/kg	17000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Nitrobenzene	ug/kg	22000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
N-Nitrosodi-n-propylamine	ug/kg	330	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
N-Nitrosodiphenylamine	ug/kg	470000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Pentachlorophenol	ug/kg	4000	1000 U	1100 U	1000 U	1000 U	900 U	1000 U	940 U	1100 U
Phenanthrene	ug/kg	NV	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Phenol	ug/kg	25000000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Pyrene	ug/kg	2300000	400 U	420 U	400 U	410 U	360 U	410 U	370 U	450 U
Metals										
Aluminum	ug/kg	110000000	16200000	9400000	22400000	8670000	11700000	3390000	14200000	11200000
Antimony	ug/kg	47000	349 J	6340 UJ	805 J	4720 UJ	397 J	5890 U	5260 UJ	6550 UJ
Arsenic	ug/kg	3000	655 J	1270 U	1650	990	1000	1180 U	1010 J	1310 U
Barium	ug/kg	22000000	8570	12700	31800	9680	19900	2550 J	8650	1980 J
Beryllium	ug/kg	230000	273 J	464 J	245 J	82 J	161 J	157 J	233 J	450 J
Cadmium	ug/kg	98000	588 U	634 U	563 U	472 U	141 J	589 U	526 U	655 U
Chromium	ug/kg	NV	5590	1720	15000	7350	12500	231 J	8840	191 J
Cobalt	ug/kg	35000	749 J	1990 J	2060 J	877 J	1380 J	139 J	1260 J	99.9 J
Copper	ug/kg	4700000	1860 J	574 J	5560	1650 J	11100	1880 J	3300	464 J
Iron	ug/kg	82000000	6280000	1620000	16600000	7790000	9870000	1330000	10400000	511000
Lead	ug/kg	800000	11300	26700	11400	5980	26800	2140 J	18100	10800
Magnesium	ug/kg	NV	252000	124000	266000	111000	156000	22500 J	178000	104000
Manganese	ug/kg	2600000	16000	205000	26800	12000	26800	3400 J	28900	4650
Mercury	ug/kg	4600	10.4 J	108 U	12.6 J	16.4 J	35.5 J	119 U	13.7 J	117 U
Nickel	ug/kg	2200000	769 J	296 J	2860 J	816 J	1720 J	137 J	1240 J	132 J
Potassium	ug/kg	NV	545000	267000	412000	173000	208000	214000	270000	242000
Selenium	ug/kg	580000	588 U	634 U	563 U	472 U	497 U	589 U	526 U	655 U
Silver	ug/kg	580000	25.7 J	1270 U	1130 U	944 U	993 U	1180 U	1050 U	1310 U
Sodium	ug/kg	NV	73500 J	30700 J	55700 J	20700 J	22500 J	12500 J	22200 J	18200 J
Thallium	ug/kg	1200	1180 U	1270 U	1130 U	944 U	993 U	1180 U	1050 U	335 J
Vanadium	ug/kg	580000	8490 J	456 J	31800 J	13700 J	15700 J	117 J	16300 J	60.7 J
Zinc	ug/kg	35000000	6180	5220	7020	2750	40900	2060 J	7000	3840

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
EPA RSL - Screening criteria for industrial soils (THQ 0.1)
NV - No RSL value established for screening
"--" - Compound not analyzed
2370 - Bold values exceed the screening criteria

Table 3.1

Historical Soil Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			MW-5_2016	MW-5_2016	MW-6_2016	MW-6_2016	MW-6_2016
Sample ID:			SO-077150-101216-DJB-009	SO-077150-101216-DJB-010	SO-077150-101216-DJB-017	SO-077150-101216-DJB-018	SO-077150-101216-DJB-019
Sample Date:			10/12/2016	10/12/2016	10/12/2016	10/12/2016	10/12/2016
Sample Depth:		EPA RSL Industrial Soil	(0-2) ft BGS	(10-13) ft BGS	(0.5-1.5) ft BGS	(0.5-1.5) ft BGS (Duplicate)	(13-15) ft BGS
Parameters	**Units**						
VOCs							
1,1,1,2-Tetrachloroethane	ug/kg	8800	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
1,1,1-Trichloroethane	ug/kg	3600000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
1,1,2,2-Tetrachloroethane	ug/kg	2700	--	--	--	--	--
1,1,2-Trichloroethane	ug/kg	630	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
1,1-Dichloroethane	ug/kg	16000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
1,1-Dichloroethene	ug/kg	100000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
1,2,4-Trichlorobenzene	ug/kg	26000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	64	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
1,2-Dibromoethane (Ethylene dibromide)	ug/kg	160	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
1,2-Dichlorobenzene	ug/kg	930000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
1,2-Dichloroethane	ug/kg	2000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
1,2-Dichloropropane	ug/kg	6600	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
1,3-Dichlorobenzene	ug/kg	NV	--	--	--	--	--
1,3-Dichloropropane	ug/kg	2300000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
1,4-Dichlorobenzene	ug/kg	11000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/kg	19000000	7.2 U	8.6 U	8.7 U	8.2 U	8.8 U
2-Hexanone	ug/kg	130000	7.2 U	8.6 U	8.7 U	8.2 U	8.8 U
4-Methyl-2-pentanone (Methyl isobutyl ketone)	ug/kg	14000000	7.2 U	8.6 U	8.7 U	8.2 U	8.8 U
Acetone	ug/kg	67000000	19	16	17	15	8.8 U
Benzene	ug/kg	5100	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Bromodichloromethane	ug/kg	1300	--	--	--	--	--
Bromoform	ug/kg	86000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Bromomethane (Methyl bromide)	ug/kg	3000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Carbon disulfide	ug/kg	350000	7.2 U	8.6 U	8.7 U	8.2 U	8.8 U
Carbon tetrachloride	ug/kg	2900	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Chlorobenzene	ug/kg	130000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Chlorobromomethane	ug/kg	63000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Chloroethane	ug/kg	5700000	7.2 U	8.6 U	8.7 U	8.2 U	8.8 U
Chloroform (Trichloromethane)	ug/kg	1400	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Chloromethane (Methyl chloride)	ug/kg	46000	7.2 U	8.6 U	8.7 U	8.2 U	8.8 U
cis-1,2-Dichloroethene	ug/kg	230000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
cis-1,3-Dichloropropene	ug/kg	NV	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Cyclohexane	ug/kg	2700000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Dibromochloromethane	ug/kg	39000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Dichlorodifluoromethane (CFC-12)	ug/kg	37000	7.2 U	8.6 U	8.7 U	8.2 U	8.8 U
Ethylbenzene	ug/kg	25000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Isopropyl benzene	ug/kg	990000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Methyl acetate	ug/kg	120000000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Methyl cyclohexane	ug/kg	NV	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Methyl tert butyl ether (MTBE)	ug/kg	210000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Methylene chloride	ug/kg	320000	7.2 U	8.6 U	8.7 U	8.2 U	8.8 U
Styrene	ug/kg	3500000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Tetrachloroethene	ug/kg	39000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Toluene	ug/kg	4700000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
trans-1,2-Dichloroethene	ug/kg	2300000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
trans-1,3-Dichloropropene	ug/kg	NV	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Trichloroethene	ug/kg	1900	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Trichlorofluoromethane (CFC-11)	ug/kg	35000000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U
Trifluorotrichloroethane (CFC-113)	ug/kg	2800000	7.2 U	8.6 U	8.7 U	8.2 U	8.8 U
Vinyl chloride	ug/kg	1700	7.2 U	8.6 U	8.7 U	8.2 U	8.8 U
Xylenes (total)	ug/kg	250000	3.6 U	4.3 U	4.3 U	4.1 U	4.4 U

Table 3.1

Historical Soil Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			MW-5_2016	MW-5_2016	MW-6_2016	MW-6_2016	MW-6_2016
Sample ID:			SO-077150-101216-DJB-009	SO-077150-101216-DJB-010	SO-077150-101216-DJB-017	SO-077150-101216-DJB-018	SO-077150-101216-DJB-019
Sample Date:			10/12/2016	10/12/2016	10/12/2016	10/12/2016	10/12/2016
Sample Depth:		EPA RSL Industrial Soil	(0-2) ft BGS	(10-13) ft BGS	(0.5-1.5) ft BGS	(0.5-1.5) ft BGS (Duplicate)	(13-15) ft BGS
Parameters	**Units**						
SVOCs							
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl)	ug/kg	4700000	360 U	410 U	380 U	380 U	410 U
2,4,5-Trichlorophenol	ug/kg	8200000	900 U	1000 U	950 U	970 U	1000 U
2,4,6-Trichlorophenol	ug/kg	82000	360 U	410 U	380 U	380 U	410 U
2,4-Dichlorophenol	ug/kg	250000	360 U	410 U	380 U	380 U	410 U
2,4-Dimethylphenol	ug/kg	1600000	360 U	410 U	380 U	380 U	410 U
2,4-Dinitrophenol	ug/kg	160000	900 U	1000 U	950 U	970 U	1000 U
2,4-Dinitrotoluene	ug/kg	7400	360 U	410 U	380 U	380 U	410 U
2,6-Dinitrotoluene	ug/kg	1500	360 U	410 U	380 U	380 U	410 U
2-Chloronaphthalene	ug/kg	6000000	360 U	410 U	380 U	380 U	410 U
2-Chlorophenol	ug/kg	580000	360 U	410 U	380 U	380 U	410 U
2-Methylnaphthalene	ug/kg	300000	360 U	410 U	380 U	380 U	410 U
2-Methylphenol	ug/kg	4100000	360 U	410 U	380 U	380 U	410 U
2-Nitroaniline	ug/kg	800000	900 U	1000 U	950 U	970 U	1000 U
2-Nitrophenol	ug/kg	NV	360 U	410 U	380 U	380 U	410 U
3,3'-Dichlorobenzidine	ug/kg	5100	360 U	410 U	380 U	380 U	410 U
3-Nitroaniline	ug/kg		900 U	1000 U	950 U	970 U	1000 U
4,6-Dinitro-2-methylphenol	ug/kg	6600	900 U	1000 U	950 U	970 U	1000 U
4-Bromophenyl phenyl ether	ug/kg	NV	360 U	410 U	380 U	380 U	410 U
4-Chloro-3-methylphenol	ug/kg	8200000	360 U	410 U	380 U	380 U	410 U
4-Chloroaniline	ug/kg	11000	360 U	410 U	380 U	380 U	410 U
4-Chlorophenyl phenyl ether	ug/kg	NV	360 U	410 U	380 U	380 U	410 U
4-Methylphenol	ug/kg	8200000	360 U	410 U	380 U	380 U	410 U
4-Nitroaniline	ug/kg	110000	900 U	1000 U	950 U	970 U	1000 U
4-Nitrophenol	ug/kg	NV	900 U	1000 U	950 U	970 U	1000 U
Acenaphthene	ug/kg	4500000	360 U	410 U	380 U	380 U	410 U
Acenaphthylene	ug/kg	NV	360 U	410 U	380 U	380 U	410 U
Acetophenone	ug/kg	12000000	360 U	410 U	380 U	380 U	410 U
Anthracene	ug/kg	23000000	360 U	410 U	380 U	380 U	410 U
Atrazine	ug/kg	10000	360 U	410 U	380 U	380 U	410 U
Benzaldehyde	ug/kg	820000	360 U	410 U	380 U	380 U	410 U
Benzo(a)anthracene	ug/kg	21000	360 U	410 U	380 U	380 U	410 U
Benzo(a)pyrene	ug/kg	2100	360 U	410 U	380 U	380 U	410 U
Benzo(b)fluoranthene	ug/kg	21000	360 U	410 U	380 U	380 U	410 U
Benzo(g,h,i)perylene	ug/kg	NV	360 U	410 U	380 U	380 U	410 U
Benzo(k)fluoranthene	ug/kg	210000	360 U	410 U	380 U	380 U	410 U
Biphenyl (1,1-Biphenyl)	ug/kg	20000	360 U	410 U	380 U	380 U	410 U
bis(2-Chloroethoxy)methane	ug/kg	250000	360 U	410 U	380 U	380 U	410 U
bis(2-Chloroethyl)ether	ug/kg	1000	360 U	410 U	380 U	380 U	410 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/kg	160000	360 U	410 U	380 U	380 U	410 U
Butyl benzylphthalate (BBP)	ug/kg	1200000	360 U	410 U	380 U	380 U	410 U
Caprolactam	ug/kg	40000000	360 U	410 U	380 U	380 U	410 U
Carbazole	ug/kg	NV	360 U	410 U	380 U	380 U	410 U
Chrysene	ug/kg	2100000	360 U	410 U	380 U	380 U	410 U
Dibenz(a,h)anthracene	ug/kg	2100	360 U	410 U	380 U	380 U	410 U
Dibenzofuran	ug/kg	100000	360 U	410 U	380 U	380 U	410 U
Diethyl phthalate	ug/kg	66000000	360 U	410 U	380 U	380 U	410 U
Dimethyl phthalate	ug/kg	NV	360 U	410 U	380 U	380 U	410 U
Di-n-butylphthalate (DBP)	ug/kg	8200000	360 U	410 U	380 U	380 U	410 U
Di-n-octyl phthalate (DnOP)	ug/kg	820000	360 U	410 U	380 U	380 U	410 U
Fluoranthene	ug/kg	3000000	360 U	410 U	380 U	380 U	410 U
Fluorene	ug/kg	3000000	360 U	410 U	380 U	380 U	410 U
Hexachlorobenzene	ug/kg	960	360 U	410 U	380 U	380 U	410 U
Hexachlorobutadiene	ug/kg	5300	360 U	410 U	380 U	380 U	410 U
Hexachlorocyclopentadiene	ug/kg	750	360 U	410 U	380 U	380 U	410 U

Table 3.1

Historical Soil Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			MW-5_2016	MW-5_2016	MW-6_2016	MW-6_2016	MW-6_2016
Sample ID:			SO-077150-101216-DJB-009	SO-077150-101216-DJB-010	SO-077150-101216-DJB-017	SO-077150-101216-DJB-018	SO-077150-101216-DJB-019
Sample Date:			10/12/2016	10/12/2016	10/12/2016	10/12/2016	10/12/2016
Sample Depth:		EPA RSL Industrial Soil	(0-2) ft BGS	(10-13) ft BGS	(0.5-1.5) ft BGS	(0.5-1.5) ft BGS (Duplicate)	(13-15) ft BGS
Parameters	**Units**						
Hexachloroethane	ug/kg	8000	360 U	410 U	380 U	380 U	410 U
Indeno(1,2,3-cd)pyrene	ug/kg	21000	360 U	410 U	380 U	380 U	410 U
Isophorone	ug/kg	2400000	360 U	410 U	380 U	380 U	410 U
Naphthalene	ug/kg	17000	360 U	410 U	380 U	380 U	410 U
Nitrobenzene	ug/kg	22000	360 U	410 U	380 U	380 U	410 U
N-Nitrosodi-n-propylamine	ug/kg	330	360 U	410 U	380 U	380 U	410 U
N-Nitrosodiphenylamine	ug/kg	470000	360 U	410 U	380 U	380 U	410 U
Pentachlorophenol	ug/kg	4000	900 U	1000 U	950 U	970 U	1000 U
Phenanthrene	ug/kg	NV	360 U	410 U	380 U	380 U	410 U
Phenol	ug/kg	25000000	360 U	410 U	380 U	380 U	410 U
Pyrene	ug/kg	2300000	360 U	410 U	380 U	380 U	410 U
Metals							
Aluminum	ug/kg	110000000	8090000	6480000	17000000	19000000	12200000
Antimony	ug/kg	47000	4340 UJ	5300 UJ	783 J	613 J	5130 UJ
Arsenic	ug/kg	3000	724 J	470 J	2010	2070	303 J
Barium	ug/kg	22000000	182000	4440 J	10100	9080	9450
Beryllium	ug/kg	230000	90.5 J	744	147 J	160 J	198 J
Cadmium	ug/kg	98000	19.2 J	530 U	549 U	429 U	513 U
Chromium	ug/kg	NV	6930	10100	13200	13900	6330
Cobalt	ug/kg	35000	735 J	898 J	1330 J	1360 J	637 J
Copper	ug/kg	4700000	1340 J	1220 J	2690 J	2710	1140 J
Iron	ug/kg	82000000	4410000	10400000	14600000	15700000	5420000
Lead	ug/kg	800000	6840	20600	9170	8700	13100
Magnesium	ug/kg	NV	94200	108000	127000	135000	224000
Manganese	ug/kg	2600000	10900	11700	12200	8390	9200
Mercury	ug/kg	4600	14.5 J	117 U	59.6 J	54.7 J	32.5 J
Nickel	ug/kg	2200000	1080 J	597 J	1210 J	1370 J	1090 J
Potassium	ug/kg	NV	155000	195000	217000	258000	383000
Selenium	ug/kg	580000	434 U	530 U	549 U	429 U	513 U
Silver	ug/kg	580000	868 U	1060 U	1100 U	857 U	1030 U
Sodium	ug/kg	NV	43700 J	30100 J	23600 J	20800 J	21100 J
Thallium	ug/kg	1200	868 U	1060 U	1100 U	857 U	1030 U
Vanadium	ug/kg	580000	8600 J	15200 J	22300 J	24400 J	9660 J
Zinc	ug/kg	35000000	3780	4810	5870	5010	5870

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
EPA RSL - Screening criteria for industrial soils (THQ 0.1)
NV - No RSL value established for screening
"--" - Compound not analyzed
2370 - Bold values exceed the screening criteria

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:					BH-1	BH-2	BH-3	BH-4	BH-5	BH-5	BH-6	BH-7
Sample ID:					GW-077150-110713-AWY-106	GW-077150-110713-AWY-102	GW-077150-110713-AWY-103	GW-077150-110613-AWY-101	GW-077150-110713-AWY-104	GW-077150-110713-AWY-105	GW-077150-110713-AWY-107	GW-077150-110713-AWY-108
Sample Date:					11/7/2013	11/7/2013	11/7/2013	11/6/2013	11/7/2013	11/7/2013 (Duplicate)	11/7/2013	11/7/2013
Parameters	Units	EPA MCL May 2020	EPA Tapwater May 2020	Criteria Used May 2020								
Field Parameters												
VOCs												
1,1,1,2-Tetrachloroethane	ug/L	--	0.57	0.57	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	ug/L	200	8000	200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	--	0.076	0.076	1.0 U	1.0 U	1.0 U	**11**	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	ug/L	5	0.28	5	1.0 U	1.0 U	**6.9**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L	--	2.8	2.8	**6.9**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	7	280	7	**10**	2.0 U	2.0 U	2.2	2.5	2.5	2.0 U	2.0 U
1,2,4-Trichlorobenzene	ug/L	70	1.2	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	0.2	0.00033	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	0.05	0.0075	0.05	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	600	300	600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	5	0.17	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	5	0.85	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	--	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	75	0.48	75	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	--	5600	5600	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/L	--	38	38	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	--	6300	6300	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	ug/L	--	14000	14000	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Benzene	ug/L	5	0.46	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	80	0.13	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	80	3.3	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	ug/L	--	7.5	7.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	ug/L	--	810	810	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon tetrachloride	ug/L	5	0.46	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chlorobenzene	ug/L	100	78	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L	--	21000	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	ug/L	80	0.22	80	1.0 U	1.0 U	1.0 U	9.5	4.2	4.3	1.0 U	1.0 U
Chloromethane (Methyl chloride)	ug/L	--	190	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	70	36	70	1.0 U	1.0 U	3.0	21	23	23	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L	--	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L	--	13000	13000	1.4 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	ug/L	80	0.87	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	--	200	200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	700	1.5	700	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	ug/L	--	450	450	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	ug/L	--	20000	20000	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl cyclohexane	ug/L	--	--	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert butyl ether (MTBE)	ug/L	--	14	14	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	5	11	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Styrene	ug/L	100	1200	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	5	11	5	1.0 U	2.8	**100**	**4600**	**3200 J**	**2700**	**690**	**120**
Toluene	ug/L	1000	1100	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	ug/L	100	360	100	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
trans-1,3-Dichloropropene	ug/L	--	--	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Trichloroethene	ug/L	5	0.49	5	1.0 U	1.0 U	2.9	**150**	**120**	**110**	**11**	1.0 U
Trichlorofluoromethane (CFC-11)	ug/L	--	5200	5200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L	--	10000	10000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Vinyl chloride	ug/L	2	0.019	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	10000	190	10000	1.0 U	1.0 U	1.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:					BH-1	BH-2	BH-3	BH-4	BH-5	BH-5	BH-6	BH-7
Sample ID:					GW-077150-110713-AWY-106	GW-077150-110713-AWY-102	GW-077150-110713-AWY-103	GW-077150-110613-AWY-101	GW-077150-110713-AWY-104	GW-077150-110713-AWY-105	GW-077150-110713-AWY-107	GW-077150-110713-AWY-108
Sample Date:					11/7/2013	11/7/2013	11/7/2013	11/6/2013	11/7/2013	11/7/2013 (Duplicate)	11/7/2013	11/7/2013
Parameters	**Units**	**EPA MCL May 2020**	**EPA Tapwater May 2020**	**Criteria Used May 2020**								
SVOCs												
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	--	710	710	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	ug/L	--	1200	1200	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	ug/L	--	4.1	4.1	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	ug/L	--	46	46	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	ug/L	--	360	360	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	ug/L	--	39	39	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	ug/L	--	0.24	0.24	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	ug/L	--	0.049	0.049	--	--	--	--	--	--	--	--
2-Chloronaphthalene	ug/L	--	750	750	--	--	--	--	--	--	--	--
2-Chlorophenol	ug/L	--	91	91	--	--	--	--	--	--	--	--
2-Methylnaphthalene	ug/L	--	36	36	--	--	--	--	--	--	--	--
2-Methylphenol	ug/L	--	930	930	--	--	--	--	--	--	--	--
2-Nitroaniline	ug/L	--	190	190	--	--	--	--	--	--	--	--
2-Nitrophenol	ug/L	--	--	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	ug/L	--	0.13	0.13	--	--	--	--	--	--	--	--
3-Nitroaniline	ug/L	--	--	--	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	ug/L	--	1.5	1.5	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	ug/L	--	--	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	ug/L	--	1400	1400	--	--	--	--	--	--	--	--
4-Chloroaniline	ug/L	--	0.37	0.37	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	ug/L	--	--	--	--	--	--	--	--	--	--	--
4-Methylphenol	ug/L	--	1900	1900	--	--	--	--	--	--	--	--
4-Nitroaniline	ug/L	--	3.8	3.8	--	--	--	--	--	--	--	--
4-Nitrophenol	ug/L	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	ug/L	--	530	530	--	--	--	--	--	--	--	--
Acenaphthylene	ug/L	--	--	--	--	--	--	--	--	--	--	--
Acetophenone	ug/L	--	1900	1900	--	--	--	--	--	--	--	--
Anthracene	ug/L	--	1800	1800	--	--	--	--	--	--	--	--
Atrazine	ug/L	3	0.3	3	--	--	--	--	--	--	--	--
Benzaldehyde	ug/L	--	19	19	--	--	--	--	--	--	--	--
Benzo(a)anthracene	ug/L	--	0.03	0.03	--	--	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	0.2	0.025	0.2	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L	--	0.25	0.25	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	ug/L	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L	--	2.5	2.5	--	--	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	ug/L	--	0.83	0.83	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	ug/L	--	59	59	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	ug/L	--	0.014	0.014	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	5.6	6	--	--	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	ug/L	--	16	16	--	--	--	--	--	--	--	--
Caprolactam	ug/L	--	9900	9900	--	--	--	--	--	--	--	--
Carbazole	ug/L	--	--	--	--	--	--	--	--	--	--	--
Chrysene	ug/L	--	25	25	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L	--	0.025	0.025	--	--	--	--	--	--	--	--
Dibenzofuran	ug/L	--	7.9	7.9	--	--	--	--	--	--	--	--
Diethyl phthalate	ug/L	--	15000	15000	--	--	--	--	--	--	--	--
Dimethyl phthalate	ug/L	--	--	--	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	ug/L	--	900	900	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	ug/L	--	200	200	--	--	--	--	--	--	--	--
Fluoranthene	ug/L	--	800	800	--	--	--	--	--	--	--	--
Fluorene	ug/L	--	290	290	--	--	--	--	--	--	--	--
Hexachlorobenzene	ug/L	1	0.0098	1	--	--	--	--	--	--	--	--
Hexachlorobutadiene	ug/L	--	0.14	0.14	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	ug/L	50	0.41	50	--	--	--	--	--	--	--	--
Hexachloroethane	ug/L	--	0.33	0.33	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L	--	0.25	0.25	--	--	--	--	--	--	--	--
Isophorone	ug/L	--	78	78	--	--	--	--	--	--	--	--
Naphthalene	ug/L	--	0.17	0.17	--	--	--	--	--	--	--	--
Nitrobenzene	ug/L	--	0.14	0.14	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	ug/L	--	0.011	0.011	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	ug/L	--	12	12	--	--	--	--	--	--	--	--
Pentachlorophenol	ug/L	1	0.041	1	--	--	--	--	--	--	--	--
Phenanthrene	ug/L	--	--	--	--	--	--	--	--	--	--	--
Phenol	ug/L	--	5800	5800	--	--	--	--	--	--	--	--
Pyrene	ug/L	--	120	120	--	--	--	--	--	--	--	--

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:					BH-1	BH-2	BH-3	BH-4	BH-5	BH-5	BH-6	BH-7
Sample ID:					GW-077150-110713-AWY-106	GW-077150-110713-AWY-102	GW-077150-110713-AWY-103	GW-077150-110613-AWY-101	GW-077150-110713-AWY-104	GW-077150-110713-AWY-105	GW-077150-110713-AWY-107	GW-077150-110713-AWY-108
Sample Date:					11/7/2013	11/7/2013	11/7/2013	11/6/2013	11/7/2013	11/7/2013 (Duplicate)	11/7/2013	11/7/2013
Parameters	**Units**	**EPA MCL May 2020**	**EPA Tapwater May 2020**	**Criteria Used May 2020**								
Metals												
Aluminum	ug/L	--	20000	20000	--	--	--	--	--	--	--	--
Antimony	ug/L	6	7.8	6	--	--	--	--	--	--	--	--
Arsenic	ug/L	10	0.052	10	--	--	--	--	--	--	--	--
Barium	ug/L	2000	3800	2000	--	--	--	--	--	--	--	--
Beryllium	ug/L	4	25	4	--	--	--	--	--	--	--	--
Cadmium	ug/L	5	9.2	5	--	--	--	--	--	--	--	--
Calcium	ug/L	--	--	--	--	--	--	--	--	--	--	--
Chromium	ug/L	100	--	100	--	--	--	--	--	--	--	--
Cobalt	ug/L	--	6	6	--	--	--	--	--	--	--	--
Copper	ug/L	1300	800	1300	--	--	--	--	--	--	--	--
Iron	ug/L	--	14000	14000	--	--	--	--	--	--	--	--
Iron (dissolved)	ug/L	--	14000	14000	--	--	--	--	--	--	--	--
Lead	ug/L	15	15	15	--	--	--	--	--	--	--	--
Magnesium	ug/L	--	--	--	--	--	--	--	--	--	--	--
Manganese	ug/L	--	430	430	--	--	--	--	--	--	--	--
Manganese (dissolved)	ug/L	--	430	430	--	--	--	--	--	--	--	--
Mercury	ug/L	2	0.63	2	--	--	--	--	--	--	--	--
Nickel	ug/L	--	390	390	--	--	--	--	--	--	--	--
Potassium	ug/L	--	--	--	--	--	--	--	--	--	--	--
Selenium	ug/L	50	100	50	--	--	--	--	--	--	--	--
Silver	ug/L	--	94	94	--	--	--	--	--	--	--	--
Sodium	ug/L	--	--	--	--	--	--	--	--	--	--	--
Thallium	ug/L	2	0.2	2	--	--	--	--	--	--	--	--
Vanadium	ug/L	--	86	86	--	--	--	--	--	--	--	--
Zinc	ug/L	--	6000	6000	--	--	--	--	--	--	--	--
Gas												
Ethane	ug/L	--	--	--	--	--	--	--	--	--	--	--
Ethene	ug/L	--	--	--	--	--	--	--	--	--	--	--
Methane	ug/L	--	--	--	--	--	--	--	--	--	--	--
Wet												
Nitrate (as N)	ug/L	10000	32000	10000	--	--	--	--	--	--	--	--
Sulfate	ug/L	--	--	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	ug/L	--	--	--	--	--	--	--	--	--	--	--

Footnotes:

U Not detected at the associated reporting limit.
J Estimated concentration.
UJ Not detected; associated reporting limit is estimated.
R Rejected.

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		BH-8	MW-1D_2016	MW-1D_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016
Sample ID:		GW-077150-110713-AWY-109	GW-077150-110716-TBM-102	GW-077150-011718-DJB-010	GW-077150-110716-TBM-101	GW-077150-011718-DJB-009	GW-077150-011718-DJB-008	GW-077150-040518-MHT-003	GW-077150-042519-SAG-005	GW-077150-072619-SAG-004	GW-077150-072619-SAG-003
Sample Date:		11/7/2013	11/7/2016	1/17/2018	11/7/2016	1/17/2018 (Duplicate)	1/17/2018	4/5/2018	4/25/2019	7/26/2019 (Duplicate)	7/26/2019
Parameters	**Units**										
Field Parameters											
VOCs											
1,1,1,2-Tetrachloroethane	ug/L	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	1.0 U	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.1	1.2
1,1-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	2.0 U	1.0 U	1.0 U	1.0 U	2.8	1.0 U	--	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U
2-Hexanone	ug/L	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U
Acetone	ug/L	20 U	30	5.0 U	5.0 U	5.0 U	5.0 U	--	41	27	23
Benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	2.4	2.1
Bromomethane (Methyl bromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	6.4	1.0 U	1.0 U
Carbon disulfide	ug/L	5.0 U	1.9	1.0 U	1.0 U	1.0 U	1.0 U	--	2.3	1.0 U	2.0
Carbon tetrachloride	ug/L	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	ug/L	1.0 U	1.2	1.0 U	2.1	2.5	2.5	--	1.0	1.5	1.2
Chloromethane (Methyl chloride)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	3.8	1.5	1.5
cis-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	2.3	5.4	5.6	--	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Dibromochloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Isopropyl benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Methyl acetate	ug/L	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	ug/L	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	5.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U
Styrene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	R
Tetrachloroethene	ug/L	**530**	1.0 U	R	**3100**	**4100**	**4200**	--	**480**	**500**	**520**
Toluene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	ug/L	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L	**6.2**	1.0 U	1.0 U	**82**	**110**	**110**	--	1.8	1.3	1.3
Trichlorofluoromethane (CFC-11)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U
Vinyl chloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 UJ
Xylenes (total)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 UJ

Table 3.2

Groundwater Analytical Results Summary
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Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		BH-8	MW-1D_2016	MW-1D_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016
Sample ID:		GW-077150-110713-AWY-109	GW-077150-110716-TBM-102	GW-077150-011718-DJB-010	GW-077150-110716-TBM-101	GW-077150-011718-DJB-009	GW-077150-011718-DJB-008	GW-077150-040518-MHT-003	GW-077150-042519-SAG-005	GW-077150-072619-SAG-004	GW-077150-072619-SAG-003
Sample Date:		11/7/2013	11/7/2016	1/17/2018	11/7/2016	1/17/2018 (Duplicate)	1/17/2018	4/5/2018	4/25/2019	7/26/2019 (Duplicate)	7/26/2019
Parameters	**Units**										
SVOCs											
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
2,4,5-Trichlorophenol	ug/L	--	25 U	--	25 U	--	--	--	--	--	--
2,4,6-Trichlorophenol	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
2,4-Dichlorophenol	ug/L	--	10 UJ	--	10 UJ	--	--	--	--	--	--
2,4-Dimethylphenol	ug/L	--	10 UJ	--	10 UJ	--	--	--	--	--	--
2,4-Dinitrophenol	ug/L	--	25 U	--	25 U	--	--	--	--	--	--
2,4-Dinitrotoluene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
2,6-Dinitrotoluene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
2-Chloronaphthalene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
2-Chlorophenol	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
2-Methylnaphthalene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
2-Methylphenol	ug/L	--	10 UJ	--	10 UJ	--	--	--	--	--	--
2-Nitroaniline	ug/L	--	25 U	--	25 U	--	--	--	--	--	--
2-Nitrophenol	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
3,3'-Dichlorobenzidine	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
3-Nitroaniline	ug/L	--	25 U	--	25 U	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	ug/L	--	25 U	--	25 U	--	--	--	--	--	--
4-Bromophenyl phenyl ether	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
4-Chloro-3-methylphenol	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
4-Chloroaniline	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
4-Methylphenol	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
4-Nitroaniline	ug/L	--	25 U	--	25 U	--	--	--	--	--	--
4-Nitrophenol	ug/L	--	25 U	--	25 U	--	--	--	--	--	--
Acenaphthene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Acenaphthylene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Acetophenone	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Anthracene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Atrazine	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Benzaldehyde	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Benzo(a)anthracene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Benzo(g,h,i)perylene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
bis(2-Chloroethyl)ether	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Caprolactam	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Carbazole	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Chrysene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Dibenzofuran	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Diethyl phthalate	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Dimethyl phthalate	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Fluoranthene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Fluorene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Hexachlorobenzene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Hexachlorobutadiene	ug/L	--	10 UJ	--	10 UJ	--	--	--	--	--	--
Hexachlorocyclopentadiene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Hexachloroethane	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Isophorone	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Naphthalene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Nitrobenzene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
N-Nitrosodiphenylamine	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Pentachlorophenol	ug/L	--	25 U	--	25 U	--	--	--	--	--	--
Phenanthrene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Phenol	ug/L	--	10 U	--	10 U	--	--	--	--	--	--
Pyrene	ug/L	--	10 U	--	10 U	--	--	--	--	--	--

Table 3.2

Groundwater Analytical Results Summary
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Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		BH-8	MW-1D_2016	MW-1D_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016
Sample ID:		GW-077150-110713-AWY-109	GW-077150-110716-TBM-102	GW-077150-011718-DJB-010	GW-077150-110716-TBM-101	GW-077150-011718-DJB-009	GW-077150-011718-DJB-008	GW-077150-040518-MHT-003	GW-077150-042519-SAG-005	GW-077150-072619-SAG-004	GW-077150-072619-SAG-003
Sample Date:		11/7/2013	11/7/2016	1/17/2018	11/7/2016	1/17/2018 (Duplicate)	1/17/2018	4/5/2018	4/25/2019	7/26/2019 (Duplicate)	7/26/2019
Parameters	**Units**										
Metals											
Aluminum	ug/L	--	4090	--	211	--	--	--	--	--	--
Antimony	ug/L	--	**56.9**	--	20.0 U	--	--	--	--	--	--
Arsenic	ug/L	--	10.0 U	--	10.0 U	--	--	--	--	--	--
Barium	ug/L	--	20.0 U	--	250	--	--	--	--	--	--
Beryllium	ug/L	--	5.00 U	--	5.00 U	--	--	--	--	--	--
Cadmium	ug/L	--	5.00 U	--	5.00 U	--	--	--	--	--	--
Calcium	ug/L	--	62000	--	558	--	--	--	--	--	--
Chromium	ug/L	--	48.9	--	10.0 U	--	--	--	--	--	--
Cobalt	ug/L	--	20.0 U	--	20.0 U	--	--	--	--	--	--
Copper	ug/L	--	10.0 U	--	10.0 U	--	--	--	--	--	--
Iron	ug/L	--	100 U	--	100 U	--	--	100 U	--	--	--
Iron (dissolved)	ug/L	--	--	--	--	--	--	100 U	--	--	--
Lead	ug/L	--	5.00 U	--	5.00 U	--	--	--	--	--	--
Magnesium	ug/L	--	100 U	--	1060	--	--	--	--	--	--
Manganese	ug/L	--	15.0 U	--	**499**	--	--	**486**	--	--	--
Manganese (dissolved)	ug/L	--	--	--	--	--	--	**476**	--	--	--
Mercury	ug/L	--	0.200 U	--	0.200 U	--	--	--	--	--	--
Nickel	ug/L	--	54.7	--	20.0 U	--	--	--	--	--	--
Potassium	ug/L	--	11300	--	5130	--	--	--	--	--	--
Selenium	ug/L	--	**62.1**	--	10.0 U	--	--	--	--	--	--
Silver	ug/L	--	10.0 U	--	10.0 U	--	--	--	--	--	--
Sodium	ug/L	--	19700 J	--	8660 J	--	--	--	--	--	--
Thallium	ug/L	--	10.0 U	--	10.0 U	--	--	--	--	--	--
Vanadium	ug/L	--	11.7	--	10.0 U	--	--	--	--	--	--
Zinc	ug/L	--	20.0 U	--	20.0 U	--	--	--	--	--	--
Gas											
Ethane	ug/L	--	--	--	--	--	--	9.0 U	--	--	--
Ethene	ug/L	--	--	--	--	--	--	7.0 U	--	--	--
Methane	ug/L	--	--	--	--	--	--	4.0 U	--	--	--
Wet											
Nitrate (as N)	ug/L	--	--	--	--	--	--	9650	--	--	--
Sulfate	ug/L	--	--	--	--	--	--	2500	--	--	--
Total organic carbon (TOC)	ug/L	--	--	--	--	--	--	2400	--	--	--

Footnotes:

U Not detected at the associated reporting limit.
J Estimated concentration.
UJ Not detected; associated reporting limit is estimated.
R Rejected.

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-2_2016	MW-2_2016	MW-3_2016	MW-3_2016	MW-4_2016	MW-4_2016	MW-5_2016	MW-5_2016	MW-5_2016	MW-5_2016
Sample ID:		GW-077150-110816-TBM-104	GW-077150-011618-DJB-002	GW-077150-110716-TBM-103	GW-077150-011618-DJB-001	GW-077150-110816-TBM-107	GW-077150-011618-DJB-004	GW-077150-110816-TBM-108	GW-077150-011618-DJB-005	GW-077150-040518-MHT-002	GW-077150-042519-SAG-006
Sample Date:		11/8/2016	1/16/2018	11/7/2016	1/16/2018	11/8/2016	1/16/2018	11/8/2016	1/16/2018	4/5/2018	4/25/2019
Parameters	**Units**										
Field Parameters											
VOCs											
1,1,1,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,1,1-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,1-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,1-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,2,4-Trichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,2-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,2-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U
2-Hexanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U
Acetone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	46
Benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Bromodichloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Bromoform	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Bromomethane (Methyl bromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Carbon disulfide	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Carbon tetrachloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Chlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Chloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Chloroform (Trichloromethane)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Chloromethane (Methyl chloride)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
cis-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
cis-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Dibromochloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Ethylbenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Isopropyl benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Methyl acetate	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Methyl cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Methyl tert butyl ether (MTBE)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Methylene chloride	ug/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	--	2.0 U
Styrene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Tetrachloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	53	49	--	14
Toluene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
trans-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
trans-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Trichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Trichlorofluoromethane (CFC-11)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Vinyl chloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Xylenes (total)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-2_2016	MW-2_2016	MW-3_2016	MW-3_2016	MW-4_2016	MW-4_2016	MW-5_2016	MW-5_2016	MW-5_2016	MW-5_2016
Sample ID:		GW-077150-110816-TBM-104	GW-077150-011618-DJB-002	GW-077150-110716-TBM-103	GW-077150-011618-DJB-001	GW-077150-110816-TBM-107	GW-077150-011618-DJB-004	GW-077150-110816-TBM-108	GW-077150-011618-DJB-005	GW-077150-040518-MHT-002	GW-077150-042519-SAG-006
Sample Date:		11/8/2016	1/16/2018	11/7/2016	1/16/2018	11/8/2016	1/16/2018	11/8/2016	1/16/2018	4/5/2018	4/25/2019
Parameters	**Units**										
SVOCs											
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
2,4,5-Trichlorophenol	ug/L	25 U	--	25 U	--	25 U	--	25 U	--	--	--
2,4,6-Trichlorophenol	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
2,4-Dichlorophenol	ug/L	10 UJ	--	10 UJ	--	10 UJ	--	10 UJ	--	--	--
2,4-Dimethylphenol	ug/L	10 UJ	--	10 UJ	--	10 UJ	--	10 UJ	--	--	--
2,4-Dinitrophenol	ug/L	25 U	--	25 U	--	25 U	--	25 U	--	--	--
2,4-Dinitrotoluene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
2,6-Dinitrotoluene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
2-Chloronaphthalene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
2-Chlorophenol	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
2-Methylnaphthalene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
2-Methylphenol	ug/L	10 UJ	--	10 UJ	--	10 UJ	--	10 UJ	--	--	--
2-Nitroaniline	ug/L	25 U	--	25 U	--	25 U	--	25 U	--	--	--
2-Nitrophenol	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
3,3'-Dichlorobenzidine	ug/L	R	--	10 U	--	10 U	--	10 U	--	--	--
3-Nitroaniline	ug/L	25 U	--	25 U	--	25 U	--	25 U	--	--	--
4,6-Dinitro-2-methylphenol	ug/L	25 U	--	25 U	--	25 U	--	25 U	--	--	--
4-Bromophenyl phenyl ether	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
4-Chloro-3-methylphenol	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
4-Chloroaniline	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
4-Chlorophenyl phenyl ether	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
4-Methylphenol	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
4-Nitroaniline	ug/L	25 U	--	25 U	--	25 U	--	25 U	--	--	--
4-Nitrophenol	ug/L	25 U	--	25 U	--	25 U	--	25 U	--	--	--
Acenaphthene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Acenaphthylene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Acetophenone	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Anthracene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Atrazine	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Benzaldehyde	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Benzo(a)anthracene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Benzo(a)pyrene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Benzo(b)fluoranthene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Benzo(g,h,i)perylene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Benzo(k)fluoranthene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Biphenyl (1,1-Biphenyl)	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
bis(2-Chloroethoxy)methane	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
bis(2-Chloroethyl)ether	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Butyl benzylphthalate (BBP)	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Caprolactam	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Carbazole	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Chrysene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Dibenz(a,h)anthracene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Dibenzofuran	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Diethyl phthalate	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Dimethyl phthalate	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Di-n-butylphthalate (DBP)	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Di-n-octyl phthalate (DnOP)	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Fluoranthene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Fluorene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Hexachlorobenzene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Hexachlorobutadiene	ug/L	10 UJ	--	10 UJ	--	10 UJ	--	10 UJ	--	--	--
Hexachlorocyclopentadiene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Hexachloroethane	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Isophorone	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Naphthalene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Nitrobenzene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
N-Nitrosodi-n-propylamine	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
N-Nitrosodiphenylamine	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Pentachlorophenol	ug/L	25 U	--	25 U	--	25 U	--	25 U	--	--	--
Phenanthrene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Phenol	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--
Pyrene	ug/L	10 U	--	10 U	--	10 U	--	10 U	--	--	--

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-2_2016	MW-2_2016	MW-3_2016	MW-3_2016	MW-4_2016	MW-4_2016	MW-5_2016	MW-5_2016	MW-5_2016	MW-5_2016
Sample ID:		GW-077150-110816-TBM-104	GW-077150-011618-DJB-002	GW-077150-110716-TBM-103	GW-077150-011618-DJB-001	GW-077150-110816-TBM-107	GW-077150-011618-DJB-004	GW-077150-110816-TBM-108	GW-077150-011618-DJB-005	GW-077150-040518-MHT-002	GW-077150-042519-SAG-006
Sample Date:		11/8/2016	1/16/2018	11/7/2016	1/16/2018	11/8/2016	1/16/2018	11/8/2016	1/16/2018	4/5/2018	4/25/2019
Parameters	**Units**										
Metals											
Aluminum	ug/L	202	--	200 U	--	754	--	273	--	--	--
Antimony	ug/L	20.0 U	--	20.0 U	--	20.0 U	--	20.0 U	--	--	--
Arsenic	ug/L	10.0 U	--	10.0 U	--	10.0 U	--	10.0 U	--	--	--
Barium	ug/L	63.5	--	117	--	30.2	--	63.4	--	--	--
Beryllium	ug/L	5.00 U	--	5.00 U	--	5.00 U	--	5.00 U	--	--	--
Cadmium	ug/L	5.00 U	--	5.00 U	--	5.00 U	--	5.00 U	--	--	--
Calcium	ug/L	1540	--	1940	--	4640	--	631	--	--	--
Chromium	ug/L	10.0 U	--	10.0 U	--	10.0 U	--	10.0 U	--	--	--
Cobalt	ug/L	20.0 U	--	20.0 U	--	20.0 U	--	20.0 U	--	--	--
Copper	ug/L	10.0 U	--	10.0 U	--	10.0 U	--	10.0 U	--	--	--
Iron	ug/L	152	--	433	--	100 U	--	100 U	--	100 U	--
Iron (dissolved)	ug/L	--	--	--	--	--	--	--	--	100 U	--
Lead	ug/L	5.00 U	--	5.00 U	--	5.00 U	--	5.00 U	--	--	--
Magnesium	ug/L	288	--	356	--	389	--	620	--	--	--
Manganese	ug/L	357	--	**1600**	--	79.9	--	145	--	66.9	--
Manganese (dissolved)	ug/L	--	--	--	--	--	--	--	--	64.6	--
Mercury	ug/L	0.200 U	--	0.200 U	--	0.200 U	--	0.200 U	--	--	--
Nickel	ug/L	20.0 U	--	20.0 U	--	20.0 U	--	20.0 U	--	--	--
Potassium	ug/L	1970	--	1820	--	25400	--	2550	--	--	--
Selenium	ug/L	10.0 U	--	10.0 U	--	10.0 U	--	10.0 U	--	--	--
Silver	ug/L	10.0 U	--	10.0 U	--	10.0 U	--	10.0 U	--	--	--
Sodium	ug/L	9790 J	--	2250 J	--	9160 J	--	1220 J	--	--	--
Thallium	ug/L	10.0 U	--	10.0 U	--	10.0 U	--	10.0 U	--	--	--
Vanadium	ug/L	10.0 U	--	10.0 U	--	10.0 U	--	10.0 U	--	--	--
Zinc	ug/L	20.0 U	--	20.0 U	--	20.0 U	--	20.0 U	--	--	--
Gas											
Ethane	ug/L	--	--	--	--	--	--	--	--	9.0 U	--
Ethene	ug/L	--	--	--	--	--	--	--	--	7.0 U	--
Methane	ug/L	--	--	--	--	--	--	--	--	4.0 U	--
Wet											
Nitrate (as N)	ug/L	--	--	--	--	--	--	--	--	811	--
Sulfate	ug/L	--	--	--	--	--	--	--	--	1870	--
Total organic carbon (TOC)	ug/L	--	--	--	--	--	--	--	--	1000 U	--

Footnotes:

U Not detected at the associated reporting limit.
J Estimated concentration.
UJ Not detected; associated reporting limit is estimated.
R Rejected.

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-5_2016	MW-6_2016	MW-6_2016	MW-6_2016	MW-6_2016	MW-6_2016
Sample ID:		GW-077150-072619-SAG-006	GW-077150-110816-TBM-106	GW-077150-110816-TBM-105	GW-077150-011618-DJB-003	GW-077150-040518-MHT-001	GW-077150-042519-SAG-001
Sample Date:		7/26/2019	11/8/2016 (Duplicate)	11/8/2016	1/16/2018	4/5/2018	4/25/2019
Parameters	**Units**						
Field Parameters							
VOCs							
1,1,1,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,1,1-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	--	--	--	--	--	--
1,1,2-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,1-Dichloroethane	ug/L	1.0 U	9.2	9.1	6.2	--	8.7
1,1-Dichloroethene	ug/L	1.0 U	33	33	29	--	34
1,2,4-Trichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,2-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,2-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U
2-Hexanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U
Acetone	ug/L	19	5.0 U	5.0 U	5.0 U	--	5.0 U
Benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Bromodichloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Bromoform	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Bromomethane (Methyl bromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Carbon disulfide	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Carbon tetrachloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Chlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Chloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Chloroform (Trichloromethane)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Chloromethane (Methyl chloride)	ug/L	0.48 J	1.0 U	1.0 U	1.0 U	--	1.0 U
cis-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
cis-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Dibromochloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Ethylbenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Isopropyl benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Methyl acetate	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Methyl cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Methyl tert butyl ether (MTBE)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Methylene chloride	ug/L	2.0 U	2.0 U	2.0 U	2.0 U	--	2.0 U
Styrene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Tetrachloroethene	ug/L	21	1.0 U	1.0 U	1.0 U	--	1.0 U
Toluene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
trans-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
trans-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Trichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0
Trichlorofluoromethane (CFC-11)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Vinyl chloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U
Xylenes (total)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-5_2016	MW-6_2016	MW-6_2016	MW-6_2016	MW-6_2016	MW-6_2016
Sample ID:		GW-077150-072619-SAG-006	GW-077150-110816-TBM-106	GW-077150-110816-TBM-105	GW-077150-011618-DJB-003	GW-077150-040518-MHT-001	GW-077150-042519-SAG-001
Sample Date:		7/26/2019	11/8/2016 (Duplicate)	11/8/2016	1/16/2018	4/5/2018	4/25/2019
Parameters	**Units**						
SVOCs							
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	--	10 U	10 U	--	--	--
2,4,5-Trichlorophenol	ug/L	--	25 U	25 U	--	--	--
2,4,6-Trichlorophenol	ug/L	--	10 U	10 U	--	--	--
2,4-Dichlorophenol	ug/L	--	10 UJ	10 UJ	--	--	--
2,4-Dimethylphenol	ug/L	--	10 UJ	10 UJ	--	--	--
2,4-Dinitrophenol	ug/L	--	25 U	25 U	--	--	--
2,4-Dinitrotoluene	ug/L	--	10 U	10 U	--	--	--
2,6-Dinitrotoluene	ug/L	--	10 U	10 U	--	--	--
2-Chloronaphthalene	ug/L	--	10 U	10 U	--	--	--
2-Chlorophenol	ug/L	--	10 U	10 U	--	--	--
2-Methylnaphthalene	ug/L	--	10 U	10 U	--	--	--
2-Methylphenol	ug/L	--	10 UJ	10 UJ	--	--	--
2-Nitroaniline	ug/L	--	25 U	25 U	--	--	--
2-Nitrophenol	ug/L	--	10 U	10 U	--	--	--
3,3'-Dichlorobenzidine	ug/L	--	10 U	10 U	--	--	--
3-Nitroaniline	ug/L	--	25 U	25 U	--	--	--
4,6-Dinitro-2-methylphenol	ug/L	--	25 U	25 U	--	--	--
4-Bromophenyl phenyl ether	ug/L	--	10 U	10 U	--	--	--
4-Chloro-3-methylphenol	ug/L	--	10 U	10 U	--	--	--
4-Chloroaniline	ug/L	--	10 U	10 U	--	--	--
4-Chlorophenyl phenyl ether	ug/L	--	10 U	10 U	--	--	--
4-Methylphenol	ug/L	--	10 U	10 U	--	--	--
4-Nitroaniline	ug/L	--	25 U	25 U	--	--	--
4-Nitrophenol	ug/L	--	25 U	25 U	--	--	--
Acenaphthene	ug/L	--	10 U	10 U	--	--	--
Acenaphthylene	ug/L	--	10 U	10 U	--	--	--
Acetophenone	ug/L	--	10 U	10 U	--	--	--
Anthracene	ug/L	--	10 U	10 U	--	--	--
Atrazine	ug/L	--	10 U	10 U	--	--	--
Benzaldehyde	ug/L	--	10 U	10 U	--	--	--
Benzo(a)anthracene	ug/L	--	10 U	10 U	--	--	--
Benzo(a)pyrene	ug/L	--	10 U	10 U	--	--	--
Benzo(b)fluoranthene	ug/L	--	10 U	10 U	--	--	--
Benzo(g,h,i)perylene	ug/L	--	10 U	10 U	--	--	--
Benzo(k)fluoranthene	ug/L	--	10 U	10 U	--	--	--
Biphenyl (1,1-Biphenyl)	ug/L	--	10 U	10 U	--	--	--
bis(2-Chloroethoxy)methane	ug/L	--	10 U	10 U	--	--	--
bis(2-Chloroethyl)ether	ug/L	--	10 U	10 U	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	--	10 U	10 U	--	--	--
Butyl benzylphthalate (BBP)	ug/L	--	10 U	10 U	--	--	--
Caprolactam	ug/L	--	10 U	10 U	--	--	--
Carbazole	ug/L	--	10 U	10 U	--	--	--
Chrysene	ug/L	--	10 U	10 U	--	--	--
Dibenz(a,h)anthracene	ug/L	--	10 U	10 U	--	--	--
Dibenzofuran	ug/L	--	10 U	10 U	--	--	--
Diethyl phthalate	ug/L	--	10 U	10 U	--	--	--
Dimethyl phthalate	ug/L	--	10 U	10 U	--	--	--
Di-n-butylphthalate (DBP)	ug/L	--	10 U	10 U	--	--	--
Di-n-octyl phthalate (DnOP)	ug/L	--	10 U	10 U	--	--	--
Fluoranthene	ug/L	--	10 U	10 U	--	--	--
Fluorene	ug/L	--	10 U	10 U	--	--	--
Hexachlorobenzene	ug/L	--	10 U	10 U	--	--	--
Hexachlorobutadiene	ug/L	--	10 UJ	10 UJ	--	--	--
Hexachlorocyclopentadiene	ug/L	--	10 U	10 U	--	--	--
Hexachloroethane	ug/L	--	10 U	10 U	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L	--	10 U	10 U	--	--	--
Isophorone	ug/L	--	10 U	10 U	--	--	--
Naphthalene	ug/L	--	10 U	10 U	--	--	--
Nitrobenzene	ug/L	--	10 U	10 U	--	--	--
N-Nitrosodi-n-propylamine	ug/L	--	10 U	10 U	--	--	--
N-Nitrosodiphenylamine	ug/L	--	10 U	10 U	--	--	--
Pentachlorophenol	ug/L	--	25 U	25 U	--	--	--
Phenanthrene	ug/L	--	10 U	10 U	--	--	--
Phenol	ug/L	--	10 U	10 U	--	--	--
Pyrene	ug/L	--	10 U	10 U	--	--	--

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-5_2016	MW-6_2016	MW-6_2016	MW-6_2016	MW-6_2016	MW-6_2016
Sample ID:		GW-077150-072619-SAG-006	GW-077150-110816-TBM-106	GW-077150-110816-TBM-105	GW-077150-011618-DJB-003	GW-077150-040518-MHT-001	GW-077150-042519-SAG-001
Sample Date:		7/26/2019	11/8/2016 (Duplicate)	11/8/2016	1/16/2018	4/5/2018	4/25/2019
Parameters	**Units**						
Metals							
Aluminum	ug/L	--	365	374	--	--	--
Antimony	ug/L	--	20.0 U	20.0 U	--	--	--
Arsenic	ug/L	--	10.0 U	10.0 U	--	--	--
Barium	ug/L	--	136	137	--	--	--
Beryllium	ug/L	--	5.00 U	5.00 U	--	--	--
Cadmium	ug/L	--	5.00 U	5.00 U	--	--	--
Calcium	ug/L	--	766	761	--	--	--
Chromium	ug/L	--	10.0 U	10.0 U	--	--	--
Cobalt	ug/L	--	20.0 U	20.0 U	--	--	--
Copper	ug/L	--	10.0 U	10.0 U	--	--	--
Iron	ug/L	--	100 U	100 U	--	100 U	--
Iron (dissolved)	ug/L	--	--	--	--	100 U	--
Lead	ug/L	--	5.00 U	5.00 U	--	--	--
Magnesium	ug/L	--	1790	1810	--	--	--
Manganese	ug/L	--	241	240	--	109	--
Manganese (dissolved)	ug/L	--	--	--	--	105	--
Mercury	ug/L	--	0.200 U	0.200 U	--	--	--
Nickel	ug/L	--	20.0 U	20.0 U	--	--	--
Potassium	ug/L	--	5620	5600	--	--	--
Selenium	ug/L	--	10.0 U	10.0 U	--	--	--
Silver	ug/L	--	10.0 U	10.0 U	--	--	--
Sodium	ug/L	--	51600 J	52400 J	--	--	--
Thallium	ug/L	--	10.0 U	10.0 U	--	--	--
Vanadium	ug/L	--	10.0 U	10.0 U	--	--	--
Zinc	ug/L	--	20.0 U	20.0 U	--	--	--
Gas							
Ethane	ug/L	--	--	--	--	9.0 U	--
Ethene	ug/L	--	--	--	--	7.0 U	--
Methane	ug/L	--	--	--	--	4.0 U	--
Wet							
Nitrate (as N)	ug/L	--	--	--	--	5740	--
Sulfate	ug/L	--	--	--	--	1190	--
Total organic carbon (TOC)	ug/L	--	--	--	--	2570	--

Footnotes:

U Not detected at the associated reporting limit.
J Estimated concentration.
UJ Not detected; associated reporting limit is estimated.
R Rejected.

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-6_2016	MW-7_2016	MW-8_2016	TW-10	TW-10	TW-10	TW-10	TW-11	TW-11
Sample ID:		GW-077150-072619-SAG-001	GW-077150-011618-DJB-007	GW-077150-011618-DJB-006	GW-077150-011419-SAG-001	GW-077150-042519-SAG-004	GW-077150-042519-SAG-003	GW-077150-072619-SAG-005	GW-077150-011419-SAG-002	GW-077150-042519-SAG-002
Sample Date:		7/26/2019	1/16/2018	1/16/2018	1/14/2019	4/25/2019 (Duplicate)	4/25/2019	7/26/2019	1/14/2019	4/25/2019
Parameters	**Units**									
Field Parameters										
VOCs										
1,1,1,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.7
1,1,1-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L	7.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	31	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Hexanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	ug/L	5.0 U	5.0 U	5.0 U	8.6	5.0 U	5.1	12	5.0 U	4.0 J
Benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	ug/L	0.24 J	1.0 U	1.0 U	1.0 U	0.77 J	0.64 J	0.76 J	1.0 U	0.83 J
Chloromethane (Methyl chloride)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.91 J	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	2.5	2.5	2.0	1.0 U	2.8
cis-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	1.0 U	1.0 U	1.0 U	4.8	910	910	1300	4.7	960
Toluene	ug/L	1.0 U	1.0 U	1.0 U	36	1.8	1.8	4.0	13	33
trans-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L	1.0	1.0 U	1.0 U	1.0 U	19	19	19	1.0 U	24
Trichlorofluoromethane (CFC-11)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.3	1.0 U

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-6_2016	MW-7_2016	MW-8_2016	TW-10	TW-10	TW-10	TW-10	TW-11	TW-11
Sample ID:		GW-077150-072619-SAG-001	GW-077150-011618-DJB-007	GW-077150-011618-DJB-006	GW-077150-011419-SAG-001	GW-077150-042519-SAG-004	GW-077150-042519-SAG-003	GW-077150-072619-SAG-005	GW-077150-011419-SAG-002	GW-077150-042519-SAG-002
Sample Date:		7/26/2019	1/16/2018	1/16/2018	1/14/2019	4/25/2019 (Duplicate)	4/25/2019	7/26/2019	1/14/2019	4/25/2019
Parameters	**Units**									
SVOCs										
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	--	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	ug/L	--	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	ug/L	--	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	ug/L	--	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	ug/L	--	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	ug/L	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	ug/L	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	ug/L	--	--	--	--	--	--	--	--	--
2-Chloronaphthalene	ug/L	--	--	--	--	--	--	--	--	--
2-Chlorophenol	ug/L	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	ug/L	--	--	--	--	--	--	--	--	--
2-Methylphenol	ug/L	--	--	--	--	--	--	--	--	--
2-Nitroaniline	ug/L	--	--	--	--	--	--	--	--	--
2-Nitrophenol	ug/L	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	ug/L	--	--	--	--	--	--	--	--	--
3-Nitroaniline	ug/L	--	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	ug/L	--	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	ug/L	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	ug/L	--	--	--	--	--	--	--	--	--
4-Chloroaniline	ug/L	--	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	ug/L	--	--	--	--	--	--	--	--	--
4-Methylphenol	ug/L	--	--	--	--	--	--	--	--	--
4-Nitroaniline	ug/L	--	--	--	--	--	--	--	--	--
4-Nitrophenol	ug/L	--	--	--	--	--	--	--	--	--
Acenaphthene	ug/L	--	--	--	--	--	--	--	--	--
Acenaphthylene	ug/L	--	--	--	--	--	--	--	--	--
Acetophenone	ug/L	--	--	--	--	--	--	--	--	--
Anthracene	ug/L	--	--	--	--	--	--	--	--	--
Atrazine	ug/L	--	--	--	--	--	--	--	--	--
Benzaldehyde	ug/L	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	ug/L	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	ug/L	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L	--	--	--	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	ug/L	--	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	ug/L	--	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	ug/L	--	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	--	--	--	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	ug/L	--	--	--	--	--	--	--	--	--
Caprolactam	ug/L	--	--	--	--	--	--	--	--	--
Carbazole	ug/L	--	--	--	--	--	--	--	--	--
Chrysene	ug/L	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L	--	--	--	--	--	--	--	--	--
Dibenzofuran	ug/L	--	--	--	--	--	--	--	--	--
Diethyl phthalate	ug/L	--	--	--	--	--	--	--	--	--
Dimethyl phthalate	ug/L	--	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	ug/L	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	ug/L	--	--	--	--	--	--	--	--	--
Fluoranthene	ug/L	--	--	--	--	--	--	--	--	--
Fluorene	ug/L	--	--	--	--	--	--	--	--	--
Hexachlorobenzene	ug/L	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene	ug/L	--	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	ug/L	--	--	--	--	--	--	--	--	--
Hexachloroethane	ug/L	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L	--	--	--	--	--	--	--	--	--
Isophorone	ug/L	--	--	--	--	--	--	--	--	--
Naphthalene	ug/L	--	--	--	--	--	--	--	--	--
Nitrobenzene	ug/L	--	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	ug/L	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	ug/L	--	--	--	--	--	--	--	--	--
Pentachlorophenol	ug/L	--	--	--	--	--	--	--	--	--
Phenanthrene	ug/L	--	--	--	--	--	--	--	--	--
Phenol	ug/L	--	--	--	--	--	--	--	--	--
Pyrene	ug/L	--	--	--	--	--	--	--	--	--

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-6_2016	MW-7_2016	MW-8_2016	TW-10	TW-10	TW-10	TW-10	TW-11	TW-11
Sample ID:		GW-077150-072619-SAG-001	GW-077150-011618-DJB-007	GW-077150-011618-DJB-006	GW-077150-011419-SAG-001	GW-077150-042519-SAG-004	GW-077150-042519-SAG-003	GW-077150-072619-SAG-005	GW-077150-011419-SAG-002	GW-077150-042519-SAG-002
Sample Date:		7/26/2019	1/16/2018	1/16/2018	1/14/2019	4/25/2019 (Duplicate)	4/25/2019	7/26/2019	1/14/2019	4/25/2019
Parameters	**Units**									
Metals										
Aluminum	ug/L	--	--	--	--	--	--	--	--	--
Antimony	ug/L	--	--	--	--	--	--	--	--	--
Arsenic	ug/L	--	--	--	--	--	--	--	--	--
Barium	ug/L	--	--	--	--	--	--	--	--	--
Beryllium	ug/L	--	--	--	--	--	--	--	--	--
Cadmium	ug/L	--	--	--	--	--	--	--	--	--
Calcium	ug/L	--	--	--	--	--	--	--	--	--
Chromium	ug/L	--	--	--	--	--	--	--	--	--
Cobalt	ug/L	--	--	--	--	--	--	--	--	--
Copper	ug/L	--	--	--	--	--	--	--	--	--
Iron	ug/L	--	--	--	--	--	--	--	--	--
Iron (dissolved)	ug/L	--	--	--	--	--	--	--	--	--
Lead	ug/L	--	--	--	--	--	--	--	--	--
Magnesium	ug/L	--	--	--	--	--	--	--	--	--
Manganese	ug/L	--	--	--	--	--	--	--	--	--
Manganese (dissolved)	ug/L	--	--	--	--	--	--	--	--	--
Mercury	ug/L	--	--	--	--	--	--	--	--	--
Nickel	ug/L	--	--	--	--	--	--	--	--	--
Potassium	ug/L	--	--	--	--	--	--	--	--	--
Selenium	ug/L	--	--	--	--	--	--	--	--	--
Silver	ug/L	--	--	--	--	--	--	--	--	--
Sodium	ug/L	--	--	--	--	--	--	--	--	--
Thallium	ug/L	--	--	--	--	--	--	--	--	--
Vanadium	ug/L	--	--	--	--	--	--	--	--	--
Zinc	ug/L	--	--	--	--	--	--	--	--	--
Gas										
Ethane	ug/L	--	--	--	--	--	--	--	--	--
Ethene	ug/L	--	--	--	--	--	--	--	--	--
Methane	ug/L	--	--	--	--	--	--	--	--	--
Wet										
Nitrate (as N)	ug/L	--	--	--	--	--	--	--	--	--
Sulfate	ug/L	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	ug/L	--	--	--	--	--	--	--	--	--

Footnotes:

U Not detected at the associated reporting limit.
J Estimated concentration.
UJ Not detected; associated reporting limit is estimated.
R Rejected.

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		**TW-11**
Sample ID:		**GW-077150-072619-SAG-002**
Sample Date:		**7/26/2019**
Parameters	**Units**	
Field Parameters		
VOCs		
1,1,1,2-Tetrachloroethane	ug/L	1.0 U
1,1,1-Trichloroethane	ug/L	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	--
1,1,2-Trichloroethane	ug/L	1.0 U
1,1-Dichloroethane	ug/L	1.0 U
1,1-Dichloroethene	ug/L	1.0 U
1,2,4-Trichlorobenzene	ug/L	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U
1,2-Dichloroethane	ug/L	1.0 U
1,2-Dichloropropane	ug/L	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	5.0 U
2-Hexanone	ug/L	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	5.0 U
Acetone	ug/L	5.0 U
Benzene	ug/L	1.0 U
Bromodichloromethane	ug/L	1.0 U
Bromoform	ug/L	1.0 U
Bromomethane (Methyl bromide)	ug/L	1.0 U
Carbon disulfide	ug/L	1.0 U
Carbon tetrachloride	ug/L	1.0 U
Chlorobenzene	ug/L	1.0 U
Chloroethane	ug/L	1.0 U
Chloroform (Trichloromethane)	ug/L	1.0 U
Chloromethane (Methyl chloride)	ug/L	1.0 U
cis-1,2-Dichloroethene	ug/L	0.44 J
cis-1,3-Dichloropropene	ug/L	1.0 U
Cyclohexane	ug/L	1.0 U
Dibromochloromethane	ug/L	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	1.0 U
Ethylbenzene	ug/L	1.0 U
Isopropyl benzene	ug/L	1.0 U
Methyl acetate	ug/L	1.0 U
Methyl cyclohexane	ug/L	1.0 U
Methyl tert butyl ether (MTBE)	ug/L	1.0 U
Methylene chloride	ug/L	2.0 U
Styrene	ug/L	1.0 U
Tetrachloroethene	ug/L	**310**
Toluene	ug/L	32
trans-1,2-Dichloroethene	ug/L	1.0 U
trans-1,3-Dichloropropene	ug/L	1.0 U
Trichloroethene	ug/L	**5.8**
Trichlorofluoromethane (CFC-11)	ug/L	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L	1.0 U
Vinyl chloride	ug/L	1.0 U
Xylenes (total)	ug/L	1.0 U

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		**TW-11**
Sample ID:		**GW-077150-072619-SAG-002**
Sample Date:		**7/26/2019**
Parameters	**Units**	
SVOCs		
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	--
2,4,5-Trichlorophenol	ug/L	--
2,4,6-Trichlorophenol	ug/L	--
2,4-Dichlorophenol	ug/L	--
2,4-Dimethylphenol	ug/L	--
2,4-Dinitrophenol	ug/L	--
2,4-Dinitrotoluene	ug/L	--
2,6-Dinitrotoluene	ug/L	--
2-Chloronaphthalene	ug/L	--
2-Chlorophenol	ug/L	--
2-Methylnaphthalene	ug/L	--
2-Methylphenol	ug/L	--
2-Nitroaniline	ug/L	--
2-Nitrophenol	ug/L	--
3,3'-Dichlorobenzidine	ug/L	--
3-Nitroaniline	ug/L	--
4,6-Dinitro-2-methylphenol	ug/L	--
4-Bromophenyl phenyl ether	ug/L	--
4-Chloro-3-methylphenol	ug/L	--
4-Chloroaniline	ug/L	--
4-Chlorophenyl phenyl ether	ug/L	--
4-Methylphenol	ug/L	--
4-Nitroaniline	ug/L	--
4-Nitrophenol	ug/L	--
Acenaphthene	ug/L	--
Acenaphthylene	ug/L	--
Acetophenone	ug/L	--
Anthracene	ug/L	--
Atrazine	ug/L	--
Benzaldehyde	ug/L	--
Benzo(a)anthracene	ug/L	--
Benzo(a)pyrene	ug/L	--
Benzo(b)fluoranthene	ug/L	--
Benzo(g,h,i)perylene	ug/L	--
Benzo(k)fluoranthene	ug/L	--
Biphenyl (1,1-Biphenyl)	ug/L	--
bis(2-Chloroethoxy)methane	ug/L	--
bis(2-Chloroethyl)ether	ug/L	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	--
Butyl benzylphthalate (BBP)	ug/L	--
Caprolactam	ug/L	--
Carbazole	ug/L	--
Chrysene	ug/L	--
Dibenz(a,h)anthracene	ug/L	--
Dibenzofuran	ug/L	--
Diethyl phthalate	ug/L	--
Dimethyl phthalate	ug/L	--
Di-n-butylphthalate (DBP)	ug/L	--
Di-n-octyl phthalate (DnOP)	ug/L	--
Fluoranthene	ug/L	--
Fluorene	ug/L	--
Hexachlorobenzene	ug/L	--
Hexachlorobutadiene	ug/L	--
Hexachlorocyclopentadiene	ug/L	--
Hexachloroethane	ug/L	--
Indeno(1,2,3-cd)pyrene	ug/L	--
Isophorone	ug/L	--
Naphthalene	ug/L	--
Nitrobenzene	ug/L	--
N-Nitrosodi-n-propylamine	ug/L	--
N-Nitrosodiphenylamine	ug/L	--
Pentachlorophenol	ug/L	--
Phenanthrene	ug/L	--
Phenol	ug/L	--
Pyrene	ug/L	--

Table 3.2

Groundwater Analytical Results Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		**TW-11**
Sample ID:		**GW-077150-072619-SAG-002**
Sample Date:		**7/26/2019**
Parameters	**Units**	
Metals		
Aluminum	ug/L	--
Antimony	ug/L	--
Arsenic	ug/L	--
Barium	ug/L	--
Beryllium	ug/L	--
Cadmium	ug/L	--
Calcium	ug/L	--
Chromium	ug/L	--
Cobalt	ug/L	--
Copper	ug/L	--
Iron	ug/L	--
Iron (dissolved)	ug/L	--
Lead	ug/L	--
Magnesium	ug/L	--
Manganese	ug/L	--
Manganese (dissolved)	ug/L	--
Mercury	ug/L	--
Nickel	ug/L	--
Potassium	ug/L	--
Selenium	ug/L	--
Silver	ug/L	--
Sodium	ug/L	--
Thallium	ug/L	--
Vanadium	ug/L	--
Zinc	ug/L	--
Gas		
Ethane	ug/L	--
Ethene	ug/L	--
Methane	ug/L	--
Wet		
Nitrate (as N)	ug/L	--
Sulfate	ug/L	--
Total organic carbon (TOC)	ug/L	--

Footnotes:

U Not detected at the associated reporting limit.
J Estimated concentration.
UJ Not detected; associated reporting limit is estimated.
R Rejected.

Table 3.3

Soil Vapor Analytical Summary
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			***100 Hunts Bridge Rd***	***100 Hunts Bridge Rd***	***100 Hunts Bridge Rd***	***100 Hunts Bridge Rd***
Sample ID:			***SG-1***	***SG-2***	***SG-3***	***SG-4***
Sample Date:			***1/4/2018***	***1/4/2018***	***1/4/2018***	***1/4/2018***
Sample Depth (ft):			***7***	***7***	***7***	***7***
Parameters	***Units***	***Target Sub-Slab and Exterior soil Gas Concentrations*** [1]				
Detected VOCs		AF= 0.03				
Benzene	ug/m3	5.20E+02	20	20	3.2 U	
Carbon disulfide	ug/m4	1.00E+05	70	110	6.4	7.5
Chloroform (Trichloromethane)	ug/m3	1.80E+02	10	37	100	8.0 U
1,1-Dichloroethane	ug/m3	2.60E+03	8.2 U	8.2 U	4.1 U	34
1,1-Dichloroethene	ug/m3	2.90E+04	8.0 U	8.0 U	4.0 U	37
Ethylbenzene	ug/m4	1.60E+03	9.7	24	4.4 U	4.4 U
Tetrachloroethene	ug/m3	5.80E+03	170	**9200**	6.9 U	610
Toluene	ug/m3	7.30E+05	86	150	20	25
1,1,1-Trichlorothane	ug/m4	7.30E+05	11 U	11 U	7.8	55
Trichloroethene	ug/m3	2.90E+02	11 U	240	5.5 U	6.3
1,2,4-Trimethylbenzene	ug/m3	8.80E+03	10	11	5.8	5.0 U
m&p-Xylenes	ug/m3	1.50E+04	31	74	11	12
o-Xylene	ug/m3	1.50E+04	12	24	4.5	4.9

Notes:

8.2 U - Not detected at the associated reporting limit.

9200 - Bold values exceed the Target Sub-Slab and Exterior Soil Gas concentration under commercial exposure scenario

NV - No value established on the RSL calculator

NC - Not calculated, screening levels were only calculated for compounds detected in the vapor samples

[1] Calculated using Vapor Intrusion Screening Level (VISL) Calculator, June 2017 USEPA VISL, Version 3.5

(THQ = 1, AF = 0.03 and Target risk for carcinogens = 10^{-5})

Table 5.1

Applicable or Relevant and Appropraite Requirements (ARARs)
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Media	Source	Law/Regulation	Summary of Requirement	ARAR Status
Groundwater (Federal)	40 CFR Part 141.61 (a)	Safe Drinking Water Act, national Primary Drinking Water Regulations, Maximum Contamiant Levels (MCLs)	Specifies the maximum permissible concentrations of contaminants in public drinking water supplies. Federally enforceable standards based, in part, on health effects and on the availability and cost of treatment techniques	ARAR - Relevant and appropraite for groundwater that is or maybe use for drinking water
Groundwater (South Carolina)	South Carolina Rule 61-58.5	South Carolina State Primamry Drinking Water Regulations, Maximum Contaminant Levels in Drinking Water	Specifies the Maximum Contaminant Levels (MCLs) for Drinking Water for organic contaminants as specified in Rule 61 -58.5.N and 40 CFR 141.61	ARAR - Relevant and appropraite for groundwater that is or maybe use for drinking water

Note:

CFR - Code of Federal Regulations
ARARs - Applicable or Relevant and Appropraite Requirements

Table 5.2

Site Remedial Action Objectives
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Enviromental Media	Remedial Action Objectives
Groundwater	***For Human Health*** Prevent potential human exposure (dermal contact, ingestion, and inhalation) to groundwater with contaminants that would result in an exccess carcinogenic rsik of $1x10^{-4}$ to $1x10^{-6}$, non-carcinogenic Hazard Index greater than one, or that exceed ARARs ***For Environmental Protection*** Restore groundwater quality ot meet ARARs

Note:

ARARs - Applicable or Relevant and Appropraite Requirements

Table 5.3

Location-Specific ARARs
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Location	Law/Regulation	Summary of Requirement	ARAR/TBC Status
Floodplains	FEMA, SC DNR Flood Mitigation Program	Avoid, to the extent possible, or minimize long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development if a practicable alternative exists. Take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains. Evaluate potential effects of actions that may be taken in floodplains and ensure that planning and budgeting reflect consideration of flood hazards and floodplain management.	TBC – To be considered for activities conducted within a 100-year floodplain.

Notes:
ARAR Applicable or Relevant and Appropriate Requirement
TBC To Be Considered

Table 5.4A

Chemical-specific ARARs for Groundwater
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Parameters VOCs	Units	EPA MCL May 2020	EPA Tapwater May 2020	Criteria Used May 2020
1,1,2,2-Tetrachloroethane	ug/L		0.076	0.076
1,1,1-Trichloroethane	ug/L	200	8000	200
1,1,2-Trichloroethane	ug/L	5	0.28	5
1,1-Dichloroethane	ug/L		2.8	2.8
1,1-Dichloroethene	ug/L	7	280	7
1,2,4-Trichlorobenzene	ug/L	70	1.2	70
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	0.2	0.00033	0.2
1,2-Dibromoethane (Ethylene dibromide)	ug/L	0.05	0.0075	0.05
1,2-Dichlorobenzene	ug/L	600	300	600
1,2-Dichloroethane	ug/L	5	0.17	5
1,2-Dichloropropane	ug/L	5	0.85	5
1,4-Dichlorobenzene	ug/L	75	0.48	75
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L		5600	5600
2-Hexanone	ug/L		38	38
4-Methyl-2-pentanone (Methyl isobutyl ketone)	ug/L		6300	6300
Acetone	ug/L		14000	14000
Benzene	ug/L	5	0.46	5
Bromodichloromethane	ug/L	80	0.13	80
Bromoform	ug/L	80	3.3	80
Bromomethane (Methyl bromide)	ug/L		7.5	7.5
Carbon disulfide	ug/L		810	810
Carbon tetrachloride	ug/L	5	0.46	5
Chlorobenzene	ug/L	100	78	100
Chloroethane	ug/L		21000	21000
Chloroform (Trichloromethane)	ug/L	80	0.22	80
Chloromethane (Methyl chloride)	ug/L		190	190
cis-1,2-Dichloroethene	ug/L	70	36	70
Cyclohexane	ug/L		13000	13000
Dibromochloromethane	ug/L	80	0.87	80
Dichlorodifluoromethane (CFC-12)	ug/L		200	200
Ethylbenzene	ug/L	700	1.5	700
Isopropyl benzene	ug/L		450	450
Methyl acetate	ug/L		20000	20000
Methyl tert butyl ether (MTBE)	ug/L		14	14
Methylene chloride	ug/L	5	11	5
Styrene	ug/L	100	1200	100
Tetrachloroethene	ug/L	5	11	5
Toluene	ug/L	1000	1100	1000
trans-1,2-Dichloroethene	ug/L	100	360	100
Trichloroethene	ug/L	5	0.49	5
Trichlorofluoromethane (CFC-11)	ug/L		5200	5200
Trifluorotrichloroethane (CFC-113)	ug/L		10000	10000
Vinyl chloride	ug/L	2	0.019	2
Xylenes (total)	ug/L	10000	190	10000

Notes:

ug/L - Micrograms per liter
Criteria Used - USEPA - Maximum Contaminant Levels (MCL) or Tapwater criteria (May 2020)
Tetrachloroethene Constituent was detected in groundwater above site-specific RG

Table 5.4B

Site-Specific Groundwater Remedial Goals
Revisd Focused Feasibility Study Report5
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Chemical Name	Units	Maximum Concentration Detected in Groundwater	Selected Site-specific Groundwater RGs	Basis for Site-specific Groundwater RGs
Volatile Organics	ug/L			
1,1,2,2-tetrachloroethane	ug/L	11	0.076	RSL
1,1,2-trichloroethane	ug/L	6.9	5	MCL
1,1-dichloroethane	ug/L	6.2	2.8	RSL
1,1-dichloroethene	ug/L	34	7	MCL
Tetrachloroethene	ug/L	4600	5	MCL
Trichlororethene	ug/L	150	5	MCL

Note:

ug/L	Micrograms per liter
MCL	USEPA Maximum Contaminant Level
RG	Remedial Goal
RSL	Regional Screeing Leveles for Chemical Contaminants (May 2020)

Table 7.1

Comparison of Groundwater Remedial Alternatives
Revised Focused Feasibility Study Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Evaluation Criteria	Alternative #1 No Action		Alternative #2 Institutional Controls and MNA		Alternative #3 ISCO and Performance Monitoring		Alternative #4 ISEB and Performance Monitoring		Alternative #5 Extraction, Treatment, and Discharge and Perfromance Monitoring	
Protection of human health and the environment	1	Does not provide overall protection of human health. There is no unacceptable risk to the environment from groundwater. Does not minimize, reduce, or control exposure risks but would eventually achieve groundwater RAOs through natural attenuation.	2	Protective of human health and the environment by eliminating potential exposure to COCs in groundwater through institutional controls. Protectiveness through MNA would be assessed during the 5-year performance evaluation phase. A more accurate estimate of the timeframe to achieve RAOs would be evaluated after the initial 5-year performance assessment period. Additional active remedies may be implemented after the 5-year evaluation period if MNA-only is deemed to be insufficent to achieve RAOs in a reasonable timeframe.	6	Protective of the environment by reducing COCs in groundwater through chemical oxidation. Protective of human health by reducing potential exposure to COCs in groundwater through institutional controls. Protectiveness through active treatment and MNA would be assessed during the 10-year performance evaluation phase.	6	Protective of the environment by reducing COCs in groundwater through reductive dechlorination. Protective of human health by reducing potential exposure to COCs in groundwater through institutional controls. Protectiveness through active treatment and MNA would be assessed during the 10-year performance evaluation phase.	3	Protective of the environment by reducing COCs in groundwater through extraction, treatment and discharge. Protective of human health by reducing potential exposure to COCs in groundwater through institutional controls. Protectiveness through active treatment and MNA would be assessed during the 10-year performance evaluation phase.
Compliance with ARARs	1	Does not comply with chemical-specific ARARs in the short-term, but would comply in the long-term. Complies with location- and action-specific ARARs.	2	Complies with chemical-specific (EPA MCLs) ARARs over time. This alternative would comply with location-specific ARARs such as avoiding or minimizing short and long term impacts associated with occupancy of floodplain and action-specific ARARs such as following established standards for construction of monitoring wells.	6	Complies with chemical-specific ARARs over time.Comply with applicable action-specific ARARs such as obtaining underground injection control (UIC) permit before injection, following standard procedures during construction of the injection wells, conducting the ISCO injection following procedures. Complies with location-specific ARARs.	6	Complies with chemical-specific (EPA MCLs) ARARs over time. Comply with applicable action-specific ARARs such as obtaining UIC permit before injection, following standard procedures during construction of the injection wells, conducting the ISEB injection following procedures and requirements	4	Complies with location and chemical-specific (EPA MCLs) ARARs over time. Complies with applicable action-specific ARARs such as obtaining proper permit before construction of the extraction wells, permit to discharge treated water into POTW, and other local applicable permits
Long-term effectiveness and permanence	1	Not effective in the short-term, but would be effective and permanent in the long-term via natural attenuation. Potential exposure risks associated with COCs in groundwater would remain in the short-term with no controls or management plan.	2	MNA will permanently reduce COC concentrations in groundwater over time. Institutional controls would need to be maintained until groundwater RAOs are achieved.	6	ISCO will permanently reduce COC concentrations in groundwater over time. MNA of residual concentrations will be evaluated over time. Institutional controls would need to be maintained until groundwater RAOs are met.	6	ISEB will permanently reduce VOC concentrations in groundwater over time. MNA of residual COCs will be evaluated over time. Institutional controls would need to be maintained until groundwater RAOs are met	5	Groundwater extraction/treatment will permanently reduce COC concentrations in groundwater over time. MNA of residual COCs will be evaluated over time. Institutional controls would need to be maintained until groundwater RAOs are achieved.
Reduction of mobility, toxicity, or volume	1	Natural attenuation processes will reduce mobility, toxicity, or volume of COCs in groundwater over time, although monitoring of these processes would not be performed.	2	Natural attenuation processes will reduce mobility, toxicity, and volume of COCs in groundwater over time. Monitoring of these processes would be performed.	6	Mobility, toxicity, and volume of COCs in groundwater are reduced via chemical destruction with ISCO and further reduced over time via MNA.	6	Mobility, toxicity, and volume of COCs in groundwater are reduced via reductive dechlorination with ISEB and further reduced over time via MNA.	4	Mobility, toxicity, and volume of COCs in groundwater are reduced via groundwater extraction and treatment and further reduced over time via MNA.
Short-term effectiveness	1	No activities would be implemented that would present potential short-term exposure risks to human health or the environment.	2	Potential exposure risks during monitoring activities are minimal and would be mitigated through engineering controls. Potential risks would be limited to groundwater monitoring personnel.	4	Potential risks from ISCO application would be mostly limited to Site workers, however transport of the oxidants may have potential risks to a lower degree. Risks would be minimized through engineering controls.	4	Potential risks from ISEB application would be mostly limited to Site workers and would be minimized through engineering controls.	3	Potential risks from construction and O&M activities would be mostly limited to Site workers. Groundwater extraction, treatment, and discharge would create potential exposure risks to workers and the surrounding other workers. Risks would be minimized through engineering controls.
Implementability	6	Technically and administratively feasible due to lack of active components.	5	Technically and administratively feasible.	3	Technically and administratively feasible.	3	Technically and administratively feasible.	2	Technically and administratively feasible.
Cost (Effectiveness Rating)	6	No cost.	4	Capital Costs: $50,000 Average Annual Performance Monitoring & IC Costs (Years 1-2): $40,000; (Years 3-5): $30,000 Average Annual Performance Monitoring & IC Costs (Years 6-10): $20,000 Total Present Value Cost: $250,000	3	Capital Costs: $200,000 Average Annual ISCO Costs (Years 1-5): $50,000 Average Annual Performance Monitoring & IC Costs (Years 6-10): $30,000 Total Present Value Cost: $600,000	3	Capital Costs: $300,000 Average Annual ISEB Costs (Years 1-5): $40,000 Average Annual Performance Monitoring & IC Costs (Years 6-10): $30,000 Total Present Value Cost: $650,000	1	Capital Costs: $500,000 Annual System O&M Costs (Years 1-10): $100,000 Average Annual Performance Evaluation & IC Costs (Years 1-10): $30,000 Total Present Value Cost: $900,000
Community Acceptance		Assessed in the ROD following public comments on the FS		Assessed in the ROD following public comments on the FS		Assessed in the ROD following public comments on the FS		Assessed in the ROD following public comments on the FS		Assessed on the ROD following public comments on the FS
Performance Ranking/Score	**17**		**19**		**34**		**34**		**22**	

Notes:

All costs are estimated to an accuracy of +50 percent to -30 percent (USEPA, 2000)

ARAR	Applicable or Relevant and Appropriate Requirement
IC	Institutional Controls
ISCO	In-Situ Chemical Oxidation
ISEB	In-Situ Enhanced Biodegradation
ROD	Record of Decision
MNA	Monitored Natural Attenuation
VOCs	Volatile Organic Compounds

Performance Ranking/Score

6 Highest Performnace Ranking
3 Moderate Performance Ranking
1 Lowest Performance Ranking

Appendices

Appendix A

Indoor Air Quality Investigation Report

3075 Breckinridge Boulevard, Suite 470
Duluth, Georgia 30096
USA
www.ghd.com

GHD Project Number: 11225667

May 12, 2021

Mr. Richard Scherer
Lippes, Mathias, Wexler and Friedman, LLP
50 Fountain Plaza, Suite 1700
Buffalo, New York 14202

Dear Mr. Scherer:

Re: Indoor Air Quality Investigation
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

1. Introduction

GHD is pleased to present the following summary of the indoor air quality investigation completed at the former Bluewater Thermal Solutions (currently Bodycote) facility located in Fountain Inn, South Carolina (hereafter referred to as the Site).

The primary objective of this investigation was to confirm indoor air quality within the on-Site buildings, and to determine if soil vapors associated with soil and groundwater impacts were contributing to indoor air quality. Soil and groundwater, impacted with volatile organic compounds (VOCs), is present on Site. The impacts are considered by to be associated with historical Site operations conducted by others on the Site in the past. A Site plan is presented as **Figure 1**.

2. Field Activities

2.1 Ambient Air

Ambient indoor air samples were collected on April 30, 2021, which consisted of six (6) ambient indoor air samples, 1 duplicate, 1 ambient outdoor air, and 1 trip blank were collected by GHD and submitted for laboratory analysis of select VOCs (tetrachloroethene (PCE) and trichloroethene (TCE)). Indoor air samples (including a duplicate) were collected over an 8-hour period at a height of approximately 5 feet above ground, at the following six locations located within buildings 5 and 6:

Location	Description
Building 5 southwest corner	West of building 5 bay doors on northeast corner of CMU office
Building 5 south central	East of bay door in building 5
Building 5 northeast corner	Northeast corner near stored pallets, north of hazardous waste storage
Building 6 offices	Center of north offices in building 6

Location	Description
Building 6 southeast corner	Southeast corner of building 6
Building 6 south central	South side in center of building 6

The ambient outdoor air sample was collected from the south west corner of the property on April 30, 2021 to establish a background outdoor air concentration. The locations of the indoor and outdoor ambient air samples are shown on Figure 1.

The air samples were collected using laboratory supplied 6-litre Summa canisters. The sampling protocol was as follows:

1. A lab-supplied regulator was attached via a Swage-lok fitting to the Summa canisters. The regulator was calibrated for an 8-hour sample. For duplicate samples, each canister received its own regulator. A Y-splitter was attached to each regulator so each sample was drawing the same air.
2. The canister was opened and the sample commenced. Start time, initial vacuum pressure, and atmospheric conditions were recorded.
3. The canister was placed at the sampling location on top of or was affixed to a stand such that the intake was at breathing height 5 feet off the floor.
4. After one hour, the canister was checked to ensure it was functioning properly.
5. The canisters were switched off at the 8-hour mark, ensuring negative pressure for shipment and laboratory analysis. At this point, the canister was closed. End time, final vacuum pressure and atmospheric conditions were recorded.

Additional sampling details for each location are provided on the indoor air sampling field data sheets which are provided in **Attachment A**.

3. Laboratory Analysis

All air samples were submitted to Analytical Environmental Services Inc (AES) for chemical analysis. The air samples were analyzed for TCE and PCE only.

A field duplicate and/or trip blank sample was also collected/analyzed. The field duplicate samples were one of two samples taken from the same media at the same location and time following the same sampling procedures in an identical manner. The field duplicate samples are used to validate field and laboratory analysis. The trip blank was a sample of analyte-free media prepared by the laboratory, taken to the Site and returned to the laboratory unopened. The trip blank is used to document contamination attributable to shipping and field handling procedures.

All samples were submitted to the analytical laboratory following chain-of-custody procedures. The chain-of-custody forms document the condition and handling of the samples throughout the collection, transportation, and final analysis of the samples. Copies of the Laboratory Certificates of Analysis are presented in **Attachment B**.

4. Results

4.1 Data Validation

To validate the analytical results, GHD scrutinized the Quality Assurance and Quality Control (QA/QC) program undertaken by AES, as summarized in the Laboratory Certificates of Analysis. This program included the following elements:

- Analyses of surrogate compounds in addition to the desired analytes.
- Spiked blank analyses to assess the accuracy of the analytical method.
- Method blank analyses to assess potential sample contamination.
- Calculation of Relative Percent Difference (RPD) between samples and duplicates, where appropriate.

Based on the results of this program, which fell within acceptable bounds for each test, the results appear to be acceptable for use without additional qualification.

4.2 Indoor Air Samples

The results of the indoor and outdoor ambient air samples are presented in Table 1 and they were compared to the United States Environmental Protection Agency (USEPA) indoor air Regional Screening Levels (RSLs) for a composite worker (USEPA, 2021[1]). These toxicity-based screening levels are non-site specific risk-based concentrations for indoor air that are considered to be protective of humans, including sensitive groups, over a lifetime. Indoor air RSLs are based on a target cancer risk of 1×10^{-6} and a target hazard quotient (HQ) of 1.

Concentrations of ambient indoor or outdoor air samples from within Buildings 5 and 6 were below the USEPA composite worker indoor air RSL. Based on these sampling results, it would appear that indoor air quality is not impacted due to the soil and groundwater concentrations of PCE and TCE at the Site.

5. Conclusions

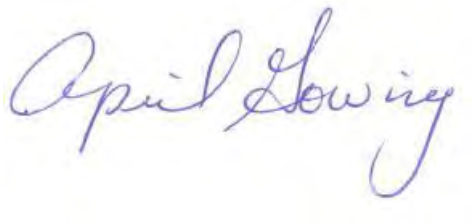
The primary objective of this investigation was to confirm indoor air quality within Buildings 5 and 6 to determine if soil vapors associated with the VOC soil and groundwater concentrations on Site were impacting indoor air quality.

Based on a review of the analytical results, the VOC impacts within soil, groundwater, and soil vapor do not appear to be major contributors to indoor air quality. However, seasonal changes can impact the migration of vapors into an enclosed structure. Therefore, it is recommended that at least one additional sampling event be conducted to account for seasonal variability.

[1] USEPA, 2021. Regional Screening Levels (RSLs), May. Regional Screening Levels (RSLs) - Generic Tables | Risk Assessment | US EPA.

We greatly appreciate the opportunity to work with the LMWF. If you have any questions, please contact me at your convenience at terefe.mazengia@ghd.com or 678-280-2140.

Regards



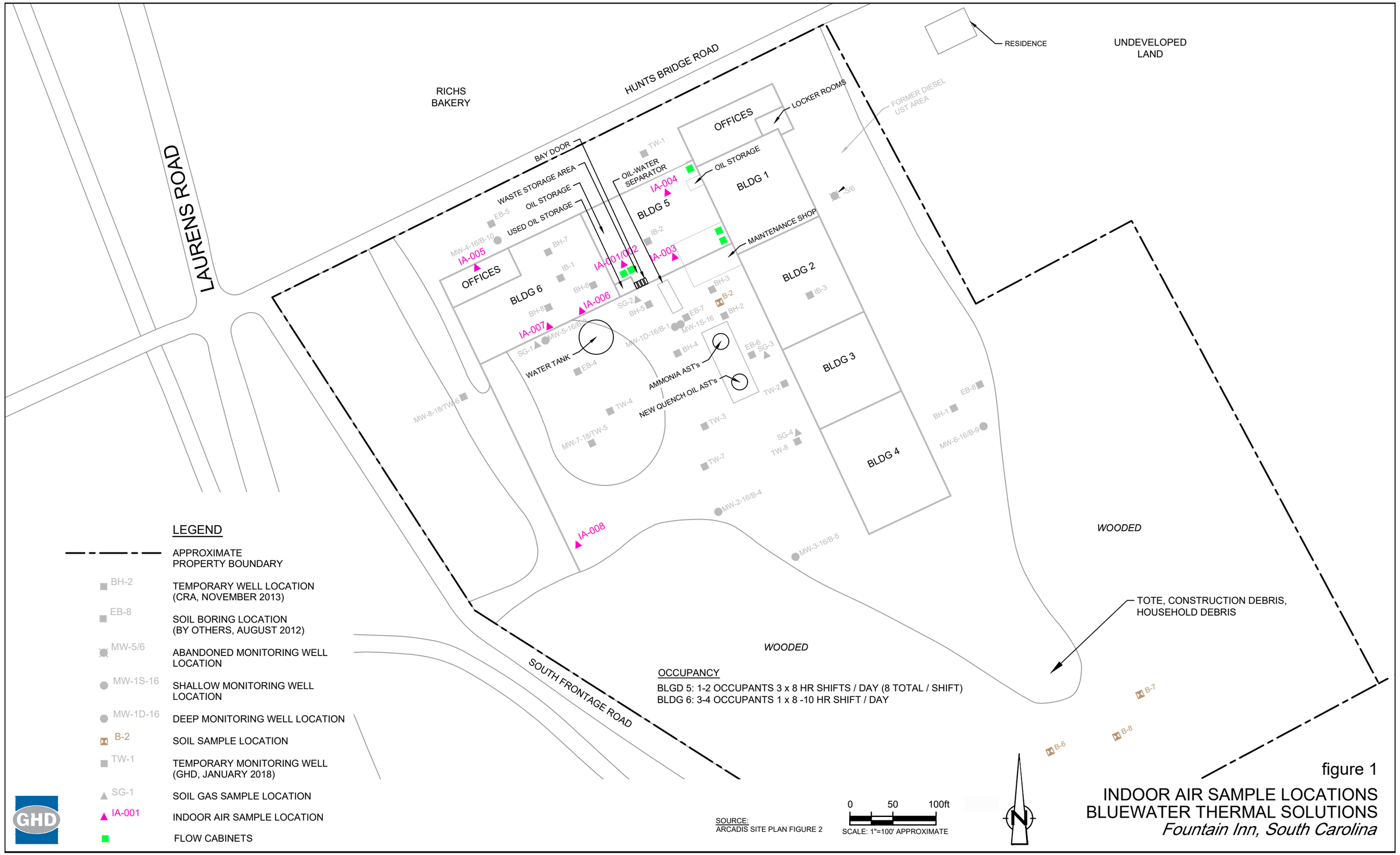
April Gowing, PHD

AG/da/2

Attachments

cc: Terefe Mazengia, GHD

Figure



LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- BH-2 — TEMPORARY WELL LOCATION (CRA, NOVEMBER 2013)
- EB-8 — SOIL BORING LOCATION (BY OTHERS, AUGUST 2012)
- MW-5/6 — ABANDONED MONITORING WELL LOCATION
- MW-1S-16 — SHALLOW MONITORING WELL LOCATION
- MW-1D-16 — DEEP MONITORING WELL LOCATION
- B-2 — SOIL SAMPLE LOCATION
- TW-1 — TEMPORARY MONITORING WELL (GHD, JANUARY 2018)
- SG-1 — SOIL GAS SAMPLE LOCATION
- IA-001 — INDOOR AIR SAMPLE LOCATION
- FLOW CABINETS

OCCUPANCY

BLGD 5: 1-2 OCCUPANTS 3 x 8 HR SHIFTS / DAY (8 TOTAL / SHIFT)
BLDG 6: 3-4 OCCUPANTS 1 x 8 -10 HR SHIFT / DAY

SOURCE:
ARCADIS SITE PLAN FIGURE 2

0 50 100ft
SCALE: 1"=100' APPROXIMATE

N

figure 1

INDOOR AIR SAMPLE LOCATIONS
BLUEWATER THERMAL SOLUTIONS
Fountain Inn, South Carolina

\\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\LTR-Scherer002\11225667-GHD-0000-LTR-EN-0101_WA-Sherer002.dwg Plot Date: MAY 12, 2021

Table

Table 1

Indoor Air Analytical Summary
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			***Building 5 SW Corner***	***Building 5 SW Corner***	***Building 5 S Central***	***Building 5 NE Corner***	***Building 6 Offices***	***Building 6 SE Corner***
Sample ID:			***IA-11225667-043021-MHT-001***	***IA-11225667-043021-MHT-002 Duplicate of -001***	***IA-11225667-043021-MHT-003***	***IA-11225667-043021-MHT-004***	***IA-11225667-043021-MHT-005***	***IA-11225667-043021-MHT-006***
Sample Date:			***4/30/2021***	***4/30/2021***	***4/30/2021***	***4/30/2021***	***4/30/2021***	***4/30/2021***
Sample Height (ft):			***5***	***5***	***5***	***5***	***5***	***5***
Parameters	***Units***	***Target Indoor Air Concentrations*** [1]						
Detected VOCs								
Tetrachloroethene	µg/m^3	47	1.2 J	1.4	0.68 J	0.54 J	0.81 J	2.8
Trichloroethene	µg/m^3	3	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U
Residual Canister Vacuum								
Initial Field Measured Residual Vacuum [2]	inches Hg		-30	-28	-28	-29	-29.5	-30
Field Measured Residual Vacuum [2]	inches Hg		-3	-2	0	-2	-2	-4

Notes:

0.17 U - Not detected at the associated reporting limit.
XX - Bold values exceed the target indoor air concentration under commercial
[1] USEPA Regional Screening Levels (RSLs), Composite Worker, Target Indoor Air
[2] Measured using field gauge.

Table 1

Indoor Air Analytical Summary
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:			***Building 6 S Central***	***Building Exterior***	***Trip Blank***
Sample ID:			***IA-11225667-043021-MHT-007***	***IA-11225667-043021-MHT-008 Ambient***	***IA-11225667-043021-MHT-009 Blank***
Sample Date:			***4/30/2021***	***4/30/2021***	***4/30/2021***
Sample Height (ft):			***5***	***5***	***--***
Parameters	***Units***	***Target Indoor Air Concentrations [1]***			
Detected VOCs					
Tetrachloroethene	µg/m^3	47	0.95 J	0.17 U	0.17 U
Trichloroethene	µg/m^3	3	0.064 U	0.064 U	0.064 U
Residual Canister Vacuum					
Initial Field Measured Residual Vacuum [2]	inches Hg		-30	-29	--
Field Measured Residual Vacuum [2]	inches Hg		-3	-1	--

Notes:

0.17 U - Not detected at the associated reporting limit.
XX - Bold values exceed the target indoor air concentration under commercial
[1] USEPA Regional Screening Levels (RSLs), Composite Worker, Target Indoor Air
[2] Measured using field gauge.

Attachments

Attachment A

Indoor Air Sampling Data

A) General Information

Sample Identification Number: IA-11225667-043021-MHT-001

Site Address: 100 Hunts Bridge Rd, Fountain Inn, SC 29644

Sample Canister Location: _____

Sample Date: 04/30/2021 Sampler: Matthew Talbert

Sample Time: Start: 0910 Stop: 1638

Shipping Date: Hand delivered to lab on 05/01/2021

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

_____

Canister Serial No.: 01077

Flow Controller Serial No.: 05909

Were "Instructions to Occupants Building" followed?
☒ Yes ❑ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	65° F	70° F	78° F	72° F

Barometric Pressure: Start 28.89" Hg; Stop 28.90" Hg

	Start	Stop
Canister Pressure Gauge Reading:	30	3
Time:	0910	1638
PID Reading:	--	--
Basement Depth (ft below grade):	N/A	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
❑ Yes ☒ No

Describe the general weather conditions: Sunny with few clouds, light wind 7-12 mph generally NW, variable humidity 25% to 42%

_____

Provide Drawing of Sample Location(s) in Building

See field sketch

C) Comments

Building 5 south interior wall west of the bay doors and on the northeast corner of the CMU offices. Near oil storage area.

A) General Information

Sample Identification Number: IA-11225667-043021-MHT-002

Site Address: 100 Hunts Bridge Rd, Fountain Inn, SC 29644

Sample Canister Location: _____

Sample Date: 04/30/2021 Sampler: Matthew Talbert

Sample Time: Start: 0912 Stop: 1641

Shipping Date: Hand delivered to lab on 05/01/2021

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

_____

Canister Serial No.: 01229

Flow Controller Serial No.: 05907

Were "Instructions to Occupants Building" followed?
☒ Yes ❑ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	65° F	70° F	78° F	72° F

Barometric Pressure: Start 28.89" Hg; Stop 28.90" Hg

	Start	Stop
Canister Pressure Gauge Reading:	28	2
Time:	0912	1641
PID Reading:	--	--
Basement Depth (ft below grade):	N/A	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
❑ Yes ☒ No

Describe the general weather conditions: Sunny with few clouds, light wind 7-12 mph generally NW, variable humidity 25% to 42%

_____

Provide Drawing of Sample Location(s) in Building

See field sketch

C) Comments

Building 5 south interior wall west of the bay doors and on the northeast corner of the CMU offices. Near oil storage area. Duplicate of IA-11225667-043021-MHT-001

A) General Information

Sample Identification Number: IA-11225667-043021-MHT-003

Site Address: 100 Hunts Bridge Rd, Fountain Inn, SC 29644

Sample Canister Location: _____

Sample Date: 04/30/2021 Sampler: Matthew Talbert

Sample Time: Start: 0916 Stop: 1644

Shipping Date: Hand delivered to lab on 05/01/2021

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

_____

Canister Serial No.: 01067

Flow Controller Serial No.: 05602

Were "Instructions to Occupants Building" followed?
☒ Yes ❑ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	65° F	70° F	78° F	72° F

Barometric Pressure: Start 28.89" Hg; Stop 28.90" Hg

	Start	Stop
Canister Pressure Gauge Reading:	28	0
Time:	0916	1644
PID Reading:	--	--
Basement Depth (ft below grade):	N/A	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
❑ Yes ☒ No

Describe the general weather conditions: Sunny with few clouds, light wind 7-12 mph generally NW, variable humidity 25% to 42%

_____

Provide Drawing of Sample Location(s) in Building

See field sketch

C) Comments

Building 5 south interior wall east of the bay doors and west of the storage racks north of the maintenance shop.

A) General Information

Sample Identification Number: IA-11225667-043021-MHT-004

Site Address: 100 Hunts Bridge Rd, Fountain Inn, SC 29644

Sample Canister Location: _____

Sample Date: 04/30/2021 Sampler: Matthew Talbert

Sample Time: Start: 0920 Stop: 1646

Shipping Date: Hand delivered to lab on 05/01/2021

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

_____

Canister Serial No.: 01088

Flow Controller Serial No.: 06357

Were "Instructions to Occupants Building" followed?
☒ Yes ❑ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	65° F	70° F	78° F	72° F

Barometric Pressure: Start 28.89" Hg; Stop 28.90" Hg

	Start	Stop
Canister Pressure Gauge Reading:	29	2
Time:	0920	1646
PID Reading:	--	--
Basement Depth (ft below grade):	N/A	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
❑ Yes ☒ No

Describe the general weather conditions: Sunny with few clouds, light wind 7-12 mph generally NW, variable humidity 25% to 42%

_____

Provide Drawing of Sample Location(s) in Building

See field sketch

C) Comments

Building 5 northeast interior corner near the stored pallets and northwest of the waste storage drums.

A) General Information

Sample Identification Number: IA-11225667-043021-MHT-005

Site Address: 100 Hunts Bridge Rd, Fountain Inn, SC 29644

Sample Canister Location:

Sample Date: 04/30/2021 Sampler: Matthew Talbert

Sample Time: Start: 0928 Stop: 1653

Shipping Date: Hand delivered to lab on 05/01/2021

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 28364

Flow Controller Serial No.: 06354

Were "Instructions to Occupants Building" followed?
☒ Yes ❑ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	65° F	70° F	78° F	72° F

Barometric Pressure: Start 28.89" Hg; Stop 28.90" Hg

	Start	Stop
Canister Pressure Gauge Reading:	29.5	2
Time:	0928	1653
PID Reading:	--	--
Basement Depth (ft below grade):	N/A	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
❑ Yes ☒ No

Describe the general weather conditions: Sunny with few clouds, light wind 7-12 mph generally NW, variable humidity 25% to 42%

Provide Drawing of Sample Location(s) in Building

See field sketch

C) Comments

Building 6 offices in the northwestern portion of the building. Center of the north wall of the office space.

A) General Information

Sample Identification Number: IA-11225667-043021-MHT-006

Site Address: 100 Hunts Bridge Rd, Fountain Inn, SC 29644

Sample Canister Location:

Sample Date: 04/30/2021 Sampler: Matthew Talbert

Sample Time: Start: 0932 Stop: 1657

Shipping Date: Hand delivered to lab on 05/01/2021

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

Canister Serial No.: 01207

Flow Controller Serial No.: 03313

Were "Instructions to Occupants Building" followed?
☒ Yes ❑ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	65° F	70° F	78° F	72° F

Barometric Pressure: Start 28.89" Hg; Stop 28.90" Hg

	Start	Stop
Canister Pressure Gauge Reading:	30	4
Time:	0932	1657
PID Reading:	--	--
Basement Depth (ft below grade):	N/A	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
❑ Yes ☒ No

Describe the general weather conditions: Sunny with few clouds, light wind 7-12 mph generally NW, variable humidity 25% to 42%

Provide Drawing of Sample Location(s) in Building

See field sketch

C) Comments

Building 6 southeast corner along the interior of the southern wall, near the bathrooms.

A) General Information

Sample Identification Number: IA-11225667-043021-MHT-007

Site Address: 100 Hunts Bridge Rd, Fountain Inn, SC 29644

Sample Canister Location: _____

Sample Date: 04/30/2021 Sampler: Matthew Talbert

Sample Time: Start: 0936 Stop: 1700

Shipping Date: Hand delivered to lab on 05/01/2021

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

_____

Canister Serial No.: 01206

Flow Controller Serial No.: 05906

Were "Instructions to Occupants Building" followed?
☒ Yes ❑ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	65° F	70° F	78° F	72° F

Barometric Pressure: Start 28.89" Hg; Stop 28.90" Hg

	Start	Stop
Canister Pressure Gauge Reading:	30	3
Time:	0936	1700
PID Reading:	--	--
Basement Depth (ft below grade):	N/A	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
❑ Yes ☒ No

Describe the general weather conditions: Sunny with few clouds, light wind 7-12 mph generally NW, variable humidity 25% to 42%

_____

Provide Drawing of Sample Location(s) in Building

See field sketch

C) Comments

Building 6 center of the building along the interior of the southern wall.

A) General Information

Sample Identification Number: IA-11225667-043021-MHT-007

Site Address: 100 Hunts Bridge Rd, Fountain Inn, SC 29644

Sample Canister Location: _____

Sample Date: 04/30/2021 Sampler: Matthew Talbert

Sample Time: Start: 0941 Stop: 1707

Shipping Date: Hand delivered to lab on 05/01/2021

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

_____

Canister Serial No.: 01189

Flow Controller Serial No.: 06259

Were "Instructions to Occupants Building" followed?
☒ Yes ❑ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	65° F	70° F	78° F	72° F

Barometric Pressure: Start 28.89" Hg; Stop 28.90" Hg

	Start	Stop
Canister Pressure Gauge Reading:	29	1
Time:	0941	1707
PID Reading:	--	--
Basement Depth (ft below grade):	N/A	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
❑ Yes ☒ No

Describe the general weather conditions: Sunny with few clouds, light wind 7-12 mph generally NW, variable humidity 25% to 42%

_____

Provide Drawing of Sample Location(s) in Building

See field sketch

C) Comments

Southwest corner of the property on the exterior of the building. South of the west corner of the Building 6 and upwind based on a NW wind direction. Field blank sample.

A) General Information

Sample Identification Number: IA-11225667-043021-MHT-009

Site Address: 100 Hunts Bridge Rd, Fountain Inn, SC 29644

Sample Canister Location: _____

Sample Date: 04/30/2021 Sampler: Matthew Talbert

Sample Time: Start: -- Stop: --

Shipping Date: Hand delivered to lab on 05/01/2021

Canister Type: 400 mL – 1.0 L Summa Canister/6 L Summa Canister/Other (specify):

_____

Canister Serial No.: 01180

Flow Controller Serial No.: --

Were "Instructions to Occupants Building" followed?
☒ Yes ❑ No

B) Sampling Information

	Start		Stop	
	Ambient	Interior	Ambient	Interior
Temperature	65° F	70° F	78° F	72° F

Barometric Pressure: Start 28.89" Hg; Stop 28.90" Hg

	Start	Stop
Canister Pressure Gauge Reading:	--	--
Time:	--	--
PID Reading:	--	--
Basement Depth (ft below grade):	N/A	
Window Marked:	Yes/No	

Was there significant precipitation (e.g., >1/2-inch rain) within 24 hours prior to (or during) the sampling event?
❑ Yes ☒ No

Describe the general weather conditions: Sunny with few clouds, light wind 7-12 mph generally NW, variable humidity 25% to 42%

_____

Provide Drawing of Sample Location(s) in Building

See field sketch

C) Comments

Trip blank sample. Remained in GHD vehicle and no regulator was attached.

Attachment B
Analytical Laboratory Report

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

May 10, 2021

Terefe Mazengia
GHD Services, Inc.

3075 Breckinridge Blvd.
Duluth GA 30096

RE: Former Bluewater Thermal Solutions

Dear Terefe Mazengia: Order No: 2105013

Analytical Environmental Services, Inc. received 9 samples on May 1, 2021 11:20 am for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES' certifications are as follows:
-NELAC/Florida Certification number E87582 for analysis of Air & Emissions for Volatile Organics effective 07/01/20-06/30/21.

These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Chris Pafford

Project Manager

3080 Presidential Drive • Atlanta, Georgia 30340 • Tel: 770.457.8177 • Fax: 770.457.8188 • Toll Free: 800.972.4889
www.aesatlanta.com

TARGET COMPOUND LIST

Compound	CAS #	Alternate Name	TO-14A	TO-15	SOP
Acetone	67-64-1				X
Allyl chloride	107-05-1	3-Chloropropene		X	
Benzene	71-43-2		X	X	
Benzyl chloride	100-44-7		X	X	
Bromodichloromethane	75-27-4	Dichlorobromomethane			X
Bromoform	75-25-2	Tribromomethane		X	
Bromomethane	74-83-9	Methyl bromide	X	X	
1,3-Butadiene	106-99-0			X	
Carbon disulfide	75-15-0			X	
Carbon tetrachloride	56-23-5		X	X	
Chlorobenzene	108-90-7		X	X	
Chloroethane	75-00-3	Ethyl chloride	X	X	
Chloroform	67-66-3		X	X	
Chloromethane	74-87-3	Methyl chloride	X	X	
Cyclohexane	110-82-7				X
Dibromochloromethane	124-48-1	Chlorodibromomethane			X
1,2-Dibromoethane	106-93-4	EDB/Ethylene dibromide	X	X	
1,2-Dichlorobenzene	95-50-1	*o*-Dichlorobenzene	X	X	
1,3-Dichlorobenzene	541-73-1	*m*-Dichlorobenzene	X	X	
1,4-Dichlorobenzene	106-46-7	p-Dichlorobenzene	X	X	
Dichlorodifluoromethane	75-71-8	Freon-12	X		
1,1-Dichloroethane	75-34-3		X	X	
1,2-Dichloroethane	107-06-2		X	X	
1,1-Dichloroethene	75-35-4	1,1-Dichloroethylene	X	X	
cis-1,2-Dichloroethene	156-59-2	*cis*-1,2-Dichloroethylene	X	X	
trans-1,2-Dichloroethene	156-60-5	*trans*-1,2-Dichloroethylene		X	
1,2-Dichloropropane	78-87-5		X	X	
cis-1,3-Dichloropropene	10061-01-5		X	X	
trans-1,3-Dichloropropene	10061-02-6		X	X	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	Freon-114	X		
1,4-Dioxane	123-91-1	1,4-Diethylene oxide		X	
Ethyl acetate	141-78-6	Acetic acid, ethyl ester			X
Ethylbenzene	100-41-4		X	X	
4-Ethyltoluene	622-96-8				X
n-Heptane	142-82-5	Heptane			X
Hexachlorobutadiene	87-68-3	Hexachloro-1,3-butadiene	X	X	
n-Hexane	110-54-3	Hexane		X	

TARGET COMPOUND LIST

Compound	CAS #	Alternate Name	TO-14A	TO-15	SOP
2-Hexanone	591-78-6	Methyl butyl ketone			X
Methylene chloride	75-09-2	Dichloromethane	X	X	
Methyl tert-butyl ether	1634-04-4	MTBE		X	
Methyl ethyl ketone	78-93-3	MEK/2-Butanone		X	
Methyl isobutyl ketone	108-10-1	4-Methyl-2-pentanone		X	
2-Propanol	67-63-0	Isopropanol/Isopropyl alcohol			X
Propene	115-07-1	Propylene			X
Styrene	100-42-5			X	
1,1,2,2-Tetrachloroethane	79-34-5		X	X	
Tetrachloroethene	127-18-4	Tetrachloroethylene	X	X	
Tetrahydrofuran	109-99-9				X
Toluene	108-88-3			X	
1,2,4-Trichlorobenzene	120-82-1			X	
1,1,1-Trichloroethane	74-55-6			X	
1,1,2-Trichloroethane	79-00-5			X	
Trichloroethene	79-01-6	Trichloroethylene		X	
Trichlorofluoromethane	75-69-4	Freon-11	X		
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	Freon-113	X		
1,2,4-Trimethylbenzene	95-63-6		X	X	
1,3,5-Trimethylbenzene	108-67-8		X	X	
2,2,4-Trimethylpentane	540-84-1	Isooctane		X	
Vinyl acetate	108-05-04			X	
Vinyl bromide	593-60-2	Bromoethene		X	
Vinyl chloride	75-01-4	Chloroethene	X	X	
Xylenes, Total	1330-20-7		X	X	
m/p-Xylene	179601-23-1		X	X	
o-Xylene	95-47-6		X	X	

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

3080 Presidential Drive
Atlanta, GA 30340
Phone: (770) 457-8177 / Fax: (770) 457-8188

VAPOR/AIR CHAIN OF CUSTODY

Work Order #: 2105013
Date: 5/1/21
Page: 1 of 1

COMPANY INFORMATION	PROJECT INFORMATION	INVOICE INFORMATION		SAMPLING INFORMATION
Company Name: GHD	Project Name: Bluewater Thermal	Company Name: GHD	Invoice To Name(s):	Sampled By (print): Matthew Talbert
Address: 3075 Breckinridge Blvd Ste 475	Project #: 11225667	Company Address: See SSOW for Billing	Invoice To Email(s):	Sampler Signature:
City, State, Zip: Duluth GA 30096	Report To Name(s): Matthew Talbert	Company City, State, Zip:	Invoice To Phone #(s):	Date: 4/30/21
Phone #: 770 403 3658	Report To Email(s): matthew.talbert@ghd.com	AES Project Manager: Chris Pafford	AES Quote # and/or PO #:	State/Project Location: SC

SPECIAL INSTRUCTIONS

Special list of analytes or other comments:

See SSOW

REQUESTED TURNAROUND TIME

- Standard (Five Days) ☑
- Two Day Rush ☐
- Four Day Rush ☐
- Next Day Rush ☐
- Three Day Rush ☐
- Other:

REPORTING REQUIREMENTS

- Standard/Level II Data Package ☐
- Level III Data Package ☐
- Level IV Data Package ☐
- EDD ☐

SHIPPING METHOD

- FedEx ☐ Client Courier ☐
- UPS ☐ US Mail ☐
- Client Drop-off ☐ Other:
- AES Courier ☐

#	Sample ID	Sample Start Date	Sample Start Time (24hr)	Sample Finish Date	Sample Finish Time (24hr)	Sample Matrix (IA = Indoor Air, AA = Ambient Air, SS = Subslab, SV = Soil Vapor)	Canister Serial #	Flow Controller ID	Canister Pressure In Field ("Hg) Start	Canister Pressure In Field ("Hg) Stop	Analysis Requested: TO-15	Remarks
1	IA-11225667-043021-AHT-001	4/30/21	0910	4/30/21	1638	IA	01077	05909	30	3	✓	
2	IA-11225667-043021-AHT-002	4/30/21	0912	4/30/21	1641	IA	01229	05907	28	2	✓	
3	IA-11225667-043021-AHT-003	4-30-21	0916	4-30-21	1644	IA	01076	05602	28	~0	✓	
4	IA-11225667-043021-AHT-004	4-30-21	0920	4-30-21	1646	IA	01088	06357	29	2	✓	
5	IA-11225667-043021-AHT-005	4-30-21	0928	4-30-21	1653	IA	28364	06354	29.5	2	✓	
6	IA-11225667-043021-AHT-006	4-30-21	0932	4-30-21	1657	IA	01207	03313	30	4	✓	
7	IA-11225667-043021-AHT-007	4-30-21	0936	4-30-21	1700	IA	01206	05906	30	3	✓	
8	IA-11225667-043021-AHT-008	4-30-21	0941	4-30-21	1707	AA	01189	06359	29	1	✓	
9	Trip Blank	4-30-21		4-30-21							✓	
10												

SAMPLE RECEIPT

Relinquished			Received		
Relinquished By: GHD	Date: 5/1/21	Time: 1120	Received By:	Date: 5/1/21	Time: 11:20
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Client assumes sole responsibility for damage or loss of samples before we accept them. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT. Visit our website at www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

White Copy - Original; Green Copy - Client

TO-15 COC 62218

Analytical Environmental Services, Inc

Date: 10-May-21

Client: GHD Services, Inc.
Project: Former Bluewater Thermal Solutions
Lab ID: 2105013

Case Narrative

All canisters were certified individually clean by the laboratory before delivery to client.

Analytical Environmental Services, Inc **TO-15 Report** **Date:** 10-May-21

Client:	GHD Services, Inc.	**Client Sample ID:**	IA-11225667-043021-MHT-001
Project Name:	Former Bluewater Thermal Solutions	**Collection Date:**	4/30/2021 4:38:00 PM
Lab ID:	2105013-001	**Matrix:**	Air

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
VOCs in Air by TO-15/TO-14A/AES SOP OA-11051					**(TO-15)**				
Tetrachloroethene	1.2	J	0.17	1.4	ug/m3	315003	2	05/10/2021 03:52	CC
Trichloroethene	BRL		0.064	1.1	ug/m3	315003	2	05/10/2021 03:52	CC
Surr: 4-Bromofluorobenzene	90.8		0	70-130	%REC	315003	2	05/10/2021 03:52	CC

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **TO-15 Report** **Date:** 10-May-21

Client:	GHD Services, Inc.	**Client Sample ID:**	IA-11225667-043021-MHT-002
Project Name:	Former Bluewater Thermal Solutions	**Collection Date:**	4/30/2021 4:41:00 PM
Lab ID:	2105013-002	**Matrix:**	Air

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
VOCs in Air by TO-15/TO-14A/AES SOP OA-11051				**(TO-15)**					
Tetrachloroethene	1.4		0.17	1.4	ug/m3	315003	2	05/10/2021 04:40	CC
Trichloroethene	BRL		0.064	1.1	ug/m3	315003	2	05/10/2021 04:40	CC
Surr: 4-Bromofluorobenzene	88		0	70-130	%REC	315003	2	05/10/2021 04:40	CC

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **TO-15 Report** **Date:** 10-May-21

Client:	GHD Services, Inc.	**Client Sample ID:**	IA-11225667-043021-MHT-003
Project Name:	Former Bluewater Thermal Solutions	**Collection Date:**	4/30/2021 4:44:00 PM
Lab ID:	2105013-003	**Matrix:**	Air

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
VOCs in Air by TO-15/TO-14A/AES SOP OA-11051				**(TO-15)**					
Tetrachloroethene	0.68	J	0.17	1.4	ug/m3	315003	2	05/10/2021 05:28	CC
Trichloroethene	BRL		0.064	1.1	ug/m3	315003	2	05/10/2021 05:28	CC
Surr: 4-Bromofluorobenzene	87.5		0	70-130	%REC	315003	2	05/10/2021 05:28	CC

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **TO-15 Report** **Date:** 10-May-21

Client:	GHD Services, Inc.	**Client Sample ID:**	IA-11225667-043021-MHT-004
Project Name:	Former Bluewater Thermal Solutions	**Collection Date:**	4/30/2021 4:46:00 PM
Lab ID:	2105013-004	**Matrix:**	Air

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
VOCs in Air by TO-15/TO-14A/AES SOP OA-11051				**(TO-15)**					
Tetrachloroethene	0.54	J	0.17	1.4	ug/m3	315003	2	05/10/2021 06:16	CC
Trichloroethene	BRL		0.064	1.1	ug/m3	315003	2	05/10/2021 06:16	CC
Surr: 4-Bromofluorobenzene	88.2		0	70-130	%REC	315003	2	05/10/2021 06:16	CC

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **TO-15 Report** **Date:** 10-May-21

Client:	GHD Services, Inc.	**Client Sample ID:**	IA-11225667-043021-MHT-005
Project Name:	Former Bluewater Thermal Solutions	**Collection Date:**	4/30/2021 4:53:00 PM
Lab ID:	2105013-005	**Matrix:**	Air

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
VOCs in Air by TO-15/TO-14A/AES SOP OA-11051				**(TO-15)**					
Tetrachloroethene	0.81	J	0.17	1.4	ug/m3	315003	2	05/10/2021 07:04	CC
Trichloroethene	BRL		0.064	1.1	ug/m3	315003	2	05/10/2021 07:04	CC
Surr: 4-Bromofluorobenzene	99		0	70-130	%REC	315003	2	05/10/2021 07:04	CC

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **TO-15 Report** **Date:** 10-May-21

Client:	GHD Services, Inc.	**Client Sample ID:**	IA-11225667-043021-MHT-006
Project Name:	Former Bluewater Thermal Solutions	**Collection Date:**	4/30/2021 3:57:00 PM
Lab ID:	2105013-006	**Matrix:**	Air

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
VOCs in Air by TO-15/TO-14A/AES SOP OA-11051				**(TO-15)**					
Tetrachloroethene	2.8		0.17	1.4	ug/m3	315003	2	05/10/2021 10:37	CC
Trichloroethene	BRL		0.064	1.1	ug/m3	315003	2	05/10/2021 10:37	CC
Surr: 4-Bromofluorobenzene	105		0	70-130	%REC	315003	2	05/10/2021 10:37	CC

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **TO-15 Report** **Date:** 10-May-21

Client:	GHD Services, Inc.	**Client Sample ID:**	IA-11225667-043021-MHT-007
Project Name:	Former Bluewater Thermal Solutions	**Collection Date:**	4/30/2021 5:00:00 PM
Lab ID:	2105013-007	**Matrix:**	Air

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
VOCs in Air by TO-15/TO-14A/AES SOP OA-11051				**(TO-15)**					
Tetrachloroethene	0.95	J	0.17	1.4	ug/m3	315003	2	05/10/2021 11:25	CC
Trichloroethene	BRL		0.064	1.1	ug/m3	315003	2	05/10/2021 11:25	CC
Surr: 4-Bromofluorobenzene	92		0	70-130	%REC	315003	2	05/10/2021 11:25	CC

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **TO-15 Report** **Date:** 10-May-21

Client:	GHD Services, Inc.	**Client Sample ID:**	IA-11225667-043021-MHT-008
Project Name:	Former Bluewater Thermal Solutions	**Collection Date:**	4/30/2021 5:07:00 PM
Lab ID:	2105013-008	**Matrix:**	Air

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
VOCs in Air by TO-15/TO-14A/AES SOP OA-11051				**(TO-15)**					
Tetrachloroethene	BRL		0.17	1.4	ug/m3	315003	2	05/10/2021 12:13	CC
Trichloroethene	BRL		0.064	1.1	ug/m3	315003	2	05/10/2021 12:13	CC
Surr: 4-Bromofluorobenzene	93		0	70-130	%REC	315003	2	05/10/2021 12:13	CC

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **TO-15 Report** **Date:** 10-May-21

Client:	GHD Services, Inc.	**Client Sample ID:**	Trip Blank
Project Name:	Former Bluewater Thermal Solutions	**Collection Date:**	4/30/2021
Lab ID:	2105013-009	**Matrix:**	Air

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
VOCs in Air by TO-15/TO-14A/AES SOP OA-11051				**(TO-15)**					
Tetrachloroethene	BRL		0.17	1.4	ug/m3	315003	2	05/10/2021 13:50	CC
Trichloroethene	BRL		0.064	1.1	ug/m3	315003	2	05/10/2021 13:50	CC
Surr: 4-Bromofluorobenzene	91.5		0	70-130	%REC	315003	2	05/10/2021 13:50	CC

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

SUMMARY OF ANALYTES DETECTED

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	Dilution Factor
Client Sample ID: IA-11225667-043021-MHT-002				**Lab ID:** 2105013-002			
Collection Date: 4/30/2021 4:41:00 PM				**Matrix:** Air			
VOCs in Air by TO-15/TO-14A/AES SOP OA-11051				**(TO-15)**			
Tetrachloroethene	1.4		0.17	1.4	ug/m3	315003	2
Client Sample ID: IA-11225667-043021-MHT-006				**Lab ID:** 2105013-006			
Collection Date: 4/30/2021 3:57:00 PM				**Matrix:** Air			
VOCs in Air by TO-15/TO-14A/AES SOP OA-11051				**(TO-15)**			
Tetrachloroethene	2.8		0.17	1.4	ug/m3	315003	2

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	F	Analyzed in the lab which is a deviation from the method
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc.

Sample Receipt Checklist for Air Canisters

Client GHD Services, Inc. Work Order Number 2105013

Checklist completed by [signature] 5/1/21
Signature Date

Carrier name: FedEx____ UPS____ Courier____ Client ✓ US Mail____ Other_____

Shipping container in good condition?	Yes ✓ No___ Not Present___
Custody seals intact on shipping container?	Yes___ No___ Not Present ✓
Chain of custody present?	Yes ✓ No___
Chain of custody signed when relinquished and received?	Yes ✓ No___
Chain of custody agrees with sample labels?	Yes ✓ No___
Field data sheets present?	Yes___ No ✓
Sample containers intact?	Yes ✓ No___

If no, explain: _____

All samples received within holding time?	Yes ✓ No___
Was TAT marked on the COC?	Yes ✓ No___
Proceed with Standard TAT as per project history?	Yes___ No___ Not Applicable ✓
All canisters received per Bottle Order issued?	Yes ✓ No___

See Case Narrative for resolution of the Non-Conformance.

Client: GHD Services, Inc.
Project Name: Former Bluewater Thermal Solutions
Workorder: 2105013

ANALYTICAL QC SUMMARY REPORT

BatchID: 315003

Sample ID: **MB-315003** Client ID: Units: **ug/m3** Prep Date: **05/09/2021** Run No: **453920**
SampleType: **MBLK** TestCode: **VOCs in Air by TO-15/TO-14A/AES SOP OA-11051** BatchID: **315003** Analysis Date: **05/09/2021** Seq No: **10379525**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Tetrachloroethene	BRL	1.4									
Trichloroethene	BRL	1.1									
Surr: 4-Bromofluorobenzene	4.020	0	4.000		100	70	130				

Sample ID: **LCS-315003** Client ID: Units: **ug/m3** Prep Date: **05/09/2021** Run No: **453920**
SampleType: **LCS** TestCode: **VOCs in Air by TO-15/TO-14A/AES SOP OA-11051** BatchID: **315003** Analysis Date: **05/09/2021** Seq No: **10381369**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Tetrachloroethene	13.02	1.4	13.56		96.0	70	130				
Trichloroethene	10.43	1.1	10.75		97.0	70	130				
Surr: 4-Bromofluorobenzene	3.690	0	4.000		92.2	70	130				

Sample ID: **2105693-002ADUP** Client ID: Units: **ug/m3** Prep Date: **05/09/2021** Run No: **453920**
SampleType: **DUP** TestCode: **VOCs in Air by TO-15/TO-14A/AES SOP OA-11051** BatchID: **315003** Analysis Date: **05/10/2021** Seq No: **10379889**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Tetrachloroethene	BRL	6.8						0	0	25	
Trichloroethene	BRL	5.4						0	0	25	
Surr: 4-Bromofluorobenzene	18.15	0	20.00		90.8	70	130	17.95	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

End of Report

Appendix B

Pilot Scale ISCO Injection Report

Updated Pilot Scale ISCO Injection Report

Former Bluewater Thermal Solutions
100 Hunts Bridge Road
Fountain Inn, South Carolina

Voluntary Cleanup Contract #14-6226-RP

Gibraltar Industries, Inc.

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Appendix Index

1. Introduction

1.1 General

GHD on behalf of Gibraltar Industries Inc. (Gibraltar) prepared this Pilot Scale In-situ Chemical Oxidation (ISCO) Injection (Pilot ISCO Injection) Report for the former Bluewater Thermal Solutions facility, located at 100 Hunts Bridge Road in Fountain Inn, South Carolina (Property or Site), based upon the requirement of the State of South Carolina Voluntary Cleanup Program (VCP).

Volatile organic compounds (VOCs) are present in groundwater at the former Bluewater Thermal Solutions Site. A remedial site investigation was conducted to assess and delineate the soil and groundwater impact at the Site. A bench scale testing was performed to determine the effectiveness, optimal oxidant and dosage for the pilot ISCO treatment of the impacted groundwater. With the approval of SCDHEC dated November 16, 2018, a pilot scale treatment of the chlorinated volatile organic compounds (CVOC) impacted groundwater was conducted based on the results of the bench scale testing.

The purpose of this Pilot ISCO Injection Report is to summarize injection procedures, injection reagents and doses and groundwater performance results. The pilot injection was conducted between January 14 and 25, 2019 and additional groundwater sampling was conducted in April and July 2019 and April 2020.

1.2 Report Organization

The remaining sections of the report are organized as follows:

Section 2	Background: presents the site description, geology and hydrogeology, and previous remedial investigations;
Section 3	Pilot Injection: presents the procedures of the pilot injection and performance groundwater results post injection; and
Section 4	Conclusion: Summary of the results
Section 5	Certification

2. Background

2.1 Site Description

The Site is located in the City of Fountain Inn in Laurens County. The facility property is located off of Interstate 385 and lies to the south of State Road S-30-731, approximately 2.0 miles southeast of the center of Fountain Inn in a commercial and agricultural area. The location of the Site is shown on Figure 1. A Site Plan/Monitoring Well Location map is provided on Figure 2.

2.2 Geology and Hydrogeology

The Property is located in the Laurens Trust Stack which is part of the Piedmont Province. The geology of this province comprises of mostly saprolite (highly weathered rock) to 35 to 40 feet below grade (ft bg) before transitioning to weathered bedrock. The Site geology consists of residual clay/silt soils to a depth of 10 to 15 ft bg where saprolite was encountered. The saprolite is mostly weathered granitic-gneiss with thick bands of feldspar. Quartz veins were observed sporadically within the saprolite unit.

The hydrogeology of the Property is comprised of an unconfined surficial aquifer (10 to 45 feet thick) consisting of silty sands underlain by the saprolite unit. The depth to groundwater in the surficial aquifer ranges from 18 to 22 ft bgs. The vertical hydraulic gradient between the surficial aquifer and the deep saprolite aquifer is downward in the central portion of the Property. Groundwater generally flow to the southeast with an average hydraulic gradient of 0.01.

Figure 3 shows cross section locations representing the Site. Geological cross-sections along with the most recent (July 2019) groundwater elevations and analytical results are provided on Figures 4 and 5.

2.3 Land Uses

The Property is zoned as commercial/industrial, with the Property owned by Bodycotes and is utilized for industrial (heat treating and thermal processing) purpose. The Property is bounded to the west and southwest by Interstate 385, to the north by commercial facility (bakery), to the south and southeast by dense wooded area and to the east by a farm land.

2.4 Site Investigation and Results

GHD conducted a Phase II Environmental Site Assessment (ESA) activities during November 2013 that included installation of eight soil borings which were converted to temporary wells for groundwater monitoring. Soil and groundwater samples were collected and analyzed for target compound list (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), total analyte list (TAL) metals and the ten most prevalent tentatively identified compounds (TICs).

Additional nine temporary monitoring wells, two permanent monitoring wells and four soil gas sample points were installed during the January 2018 event. The groundwater from all the temporary wells was screened using Color-Tec® field screening method to delineate the horizontal groundwater impact. One more round of groundwater sampling was also conducted at all monitoring wells (new and existing). All groundwater samples were analyzed for TCL VOCs. Soil gas samples were collected as part of the soil vapor intrusion assessment.

PCE and TCE in groundwater were detected above the MCL at MW-1S-16 and TCE was detected above MCL at the side-gradient well MW-5-16. Daughter products 1,1-DCA and 1,1-DCE were detected at the further downgradient well MW-6-16 slightly above the criteria used. No TCL VOCs and SVOCs were detected at MW-2-16, MW-3-16, MW-6-16, MW-7-18 and MW-8-18 above the reporting limits. Groundwater impact (primarily PCE and TCE) is delineated in all directions; the plume is centered at MW-1S-16 and BH-4 (November 2103). Based on several previous

groundwater monitoring events, the groundwater plume is localized around well MW-1S-16 and stable with very slow migration.

2.4.1 Soil

Surface and subsurface soil samples have been collected using direct push technology (DPT) at numerous locations throughout the Site to define the extent of impact (if any) and volume soil requiring remedial action. Details on the soil sampling including sample depth intervals, applicable screening of the soils and laboratory analytical results of the soil samples were presented in the Focused Phase II ESA (December 2013) and Soil and Groundwater Delineation report (February 2017).

Based upon the above, soils were not of concern and as directed by SCDHEC groundwater was the focus of the bench scale study and the pilot injection program.

2.4.2 Groundwater

2.4.2.1 Overburden Groundwater

On-Site groundwater sampling has delineated what appears to be one area of groundwater impact from historic operations where the primary impacts are chlorinated VOCs. Further details on the well installations, groundwater sampling including applicable screening (field and laboratory) of the groundwater and laboratory analytical results of the groundwater samples are provided in the Phase II ESA and the Soil and Groundwater Delineation report. Summary of the groundwater analytical results are presented as Table 1. Figure 6 provides groundwater monitoring well locations.

The November 2013 Phase II site investigation identified an area (BH-4 and BH-5) with the highest concentration of PCE and TCE. This was confirmed in later sampling at MW-1S-16. PCE is also detected at side-gradient well MW-5-16 above the MCL. Select VOC compounds (PCE, TCE, 1,1-dichloroethane (1,1-DCA), and 1,1-dichloroethene (1,1-DCE)) are detected slightly above their respective MCLs in select groundwater samples (MW-1S-16, MW-5-16 and MW-6-16).

No TCL SVOCs were detected in groundwater above the screening criteria (MCL or Tapwater). All TAL metals were reported below their respective screening criteria except antimony and selenium at MW-1D-16, manganese at MW-1S-16 and MW-3-16 which were detected above their respective MCLs. No apparent source for these metals has been identified at the Site and monitoring has indicated that elevated metal concentrations in groundwater are indicative the background.

2.4.2.2 Deep Saprolite Groundwater

Based on the results of previous groundwater sampling, including the results of the monitoring well installed in the deeper saprolite unit, no VOCs impact is present in deeper saprolite groundwater and no evidence of the vertical migration of impact has been observed.

3. Pilot Injection

The pilot ISCO injection was implemented in January 2019 as proposed in the October 2018 Bench Scale Study Report and approved by SCDHEC in a letter dated November 16, 2018. The pilot

injection consisted of one application of the oxidant to the CVOC plume area south/southeast of Buildings 5 and 6 and west of Buildings 2 and 3.

The area of treatment is approximately 13,500 square feet located between MW-5-16 and BH-3 in the north and between TW-10 and TW-11 in the south. A 20 foot radius of influence (ROI) in the saprolite material was expected resulting in 14 direct push technology (DPT) injection locations. Injections were made at 20 and 28 feet depths below ground surface (bgs) using the temporary injection points. DPT injection locations are shown on Figure 7.

For the treatment with sodium persulfate, 2,680 gallons of a 15 percent sodium persulfate ($Na_2S_2O_8$) solution containing 3,580 lb. of sodium persulfate was mixed immediately before injection with 800 gallons of 25 percent sodium hydroxide (NaOH) and injected at each location during the pilot injection event.

3.1 Injection Procedure

The treatment consisted of 14 DPT injection points each with an 8 foot saturated thickness (between 30 and 38 feet bgs) of groundwater. The aquifer has an estimated porosity of 30 percent. A conservative factor of 10 percent of the pore volume was used in the calculation in order to prevent disruption of aquifer flow, potential mounding of the water table, and the potential for mobilizing the impacted groundwater plume. As presented in the Bench Scale Study report, the total volume of reagent that the aquifer could accept at one time was approximately 4,230 gallons.

Injection point installation, reagent mixing and injection were conducted by qualified experienced contractors (Spur Environmental Services) under the direct supervision of GHD. During the injection event, volume, flow rate, and pressure were monitored at the injection points and the monitoring wells were monitored to evaluate water levels at the time of injection. Overall, injection flow rates ranged between 3 and 12 gallons per minute (gpm) and injection pressures were maintained to a maximum of 40 psi or less. The field forms for the pilot injection event are provided in Appendix A.

3.2 Monitoring Well Installation

Two temporary monitoring wells TW-10 and TW-11 were installed downgradient of MW-1S-16 to monitor performance of the pilot injection at the downgradient portion. The two temporary monitoring wells were installed using a DPT drill rig on January 14, 2019 before implementation of the pilot injection event. The two wells were constructed with total depth of 25 feet bgs (similar depth with other nearby wells) and with standard 1-inch diameter PVC casing with 10-foot machine slotted #10, schedule 40 PVC screen. The temporary well locations and groundwater performance sampling locations are shown on Figure 8.

Well construction details for the two new temporary wells are provided in Appendix B.

3.3 Post Injection Groundwater Monitoring

Groundwater performance monitoring was conducted at monitoring wells MW-1S-16, MW-5-16, MW-6-16, TW-10 and TW-11 to assess improvement of groundwater after injection of the oxidants. Base line groundwater sampling was conducted at only TW-10 and TW-11 in January before the pilot injection. Groundwater concentrations from January 2018 were used as baseline

concentrations for monitoring wells MW-1S-16, MW-5-16 and MW-6-16. Post injection groundwater monitoring was conducted in April and July 2019 and April 2020, 3-months, 6-months and 15-months following completion of the injection. The post injection monitoring included water levels, field parameter measurements, residual persulfate measurements and analysis of VOCs in the above listed five monitoring wells. The groundwater purging and sampling field forms for the two sampling events (April and July 2019 and April 2020) are presented in Appendix C. Groundwater elevation map using the April 2020 measurements are presented on Figure 9. The April 28, 2020 groundwater elevations are summarized in Table 2.

Well TW-10 is located within the treatment area approximately 12 feet away from the nearest injection point (IP-11). MW-1S is also located within the treatment area less than 10 feet from injection points IP-6 and IP-14. MW-5 is located within the treatment area less than 10 feet from IP-1. TW-11 is located just outside the injection area approximately 50 feet from the nearest injection point (IP-13). Well MW-6 is located outside the injection area.

3.3.1 VOC Concentrations

The following results are based upon the performance sampling conducted in April and July 2019 and April 2020.

Monitoring well MW-1S-16:

- PCE was reduced by 96 percent from 4,100 micrograms per liter (µg/L) to 180/150 µg/L. A 98-percent reduction from 110 µg/L to 1.7 µg/L was observed for TCE.

Monitoring well MW-5-16:

- PCE was reduced by more than 90 percent from 49 µg/L to 4.6 µg/L.

Monitoring well MW-6-16:

- 1,1-DCE and 1,1-DCA were present slightly above their MCLs prior to ISCO treatment. No reduction in concentrations was observed after ISCO treatment as this well is located approximately 250 feet away from the injection area outside of the radius of influence. Concentration of 1,1-DCE and 1,1-DCA have held steady throughout before and after the pilot injection which shows that the groundwater plume is very stable.

Monitoring wells TW-10 and TW-11:

- No CVOCs were present above MCLs prior to ISCO treatment. After the ISCO injections, however, PCE and TCE were detected at concentrations above their MCLs during both the April and July 2019 and April 2020 events. At these wells, the highest concentration of PCE was observed in TW-10 in July 2019, and concentrations had decreased by over 45 percent by April 2020. PCE concentration at TW-11 increased by more than double in April 2020. The temporary increase in concentrations of PCE and TCE in TW-10 and TW-11 could be due to redistribution of impacted groundwater during the pilot injection. We expect that the concentrations at these two wells will go back to the original state after some time.

Groundwater performance sampling results are summarized in Table 3 and illustrated on Figure 10 as data boxes. PCE and TCE isopleths for the pre- and post-injection concentrations are provided on Figures 11A and 11B and 12A and 12B, respectively. The analytical reports and the GHD data validation memorandums for the three sampling events are provided in Appendix D.

3.3.2 Residual Persulfate and pH

pH measurements were made in the performance monitoring wells during the April and July 2019 groundwater monitoring events. As the sodium persulfate reacts with the NaOH in groundwater (NaOH was used to activate the sodium persulfate), it produces sulfuric acid which neutralizes the NaOH. pH of untreated groundwater at the Site is generally less than pH 5. At well MW-1S-16, the pH was in the neutral range in April 2019, indicating that the pH had increased as a result of the injections. pH of the groundwater had returned to the pre-treatment level of less than pH 5 during the July 2019 event, which suggests that persulfate continued to react and produce sulfuric acid in this area.

At well MW-5-16, the pH of the groundwater was greater than pH 13 in April 2019, indicating that the high pH from the NaOH was still present. By July 2019, the pH in this area had decreased to 11.4, which suggests that persulfate continued to react in this area between April and July 2019. At wells MW-6-16, TW-10, and TW-11, the pH of the groundwater was between 4.2 and 4.9 in all the April and July 2019 and April 2020 measurements, which suggests that the pH of the groundwater was not affected by the ISCO injections.

Persulfate was present in wells MW-1S-16, MW-2-16, MW-5-16, and TW-10 on the last day of the injection event, with the largest amount present at well MW-5-16. Small amounts of residual persulfate were observed in wells MW-1S-16, MW-5-16, TW-10, and TW-11 in July 2019. The dissolved oxygen (DO) and ORP values at MW-1S-16 and MW-5-15 in April 2020 were still higher than the other areas showing that there is available persulfate and NaOH in the ground. Summary of the field measurements (pH, DO, conductivity, and ORP) and residual persulfate for the pre- and post-injection events are summarized on Table 4. Analysis of sulfates and metals such as aluminum and manganese were inadvertently left out of the analysis. Future groundwater monitoring events will include analysis and evaluation of metals and sulfates to determine effect of the injections on migration metals in groundwater. The field parameter measurements (pH, DO, ORP and conductivity) are included on the purging and sampling forms provided in Appendix C.

4. Conclusion

Results of the bench scale testing showed that ISCO was an effective treatment for reducing the concentrations of PCE and its daughter products in the groundwater. Base (NaOH) catalyzed sodium persulfate was the recommended oxidant as it was found to be effective for all CVOC present in the groundwater during the treatability study. Accordingly, the results post the Pilot ISCO injection show a significant PCE and TCE reduction in groundwater, especially at MW-1S-16 and MW-5S-16. At wells TW-10 and TW-11, PCE and TCE concentrations decreased by over 65 percent by July 2019 (six months post injection) from their high in April 2019. The temporary increase in concentrations of PCE and TCE in TW-10 and TW-11 in April 2019 and April 2020 could be due to redistribution of impacted groundwater during the pilot injection. Groundwater monitoring will be

performed in these wells to confirm PCE and TCE concentrations. Concentrations of VOCs in the furthest downgradient monitoring well MW-6-16 have held steady throughout before and after the pilot injection showing that the groundwater plume is very stable and contained in a small area at the southwest part of the Site.

Groundwater plume migration is limited based on several rounds of groundwater concentrations at the Site and downgradient locations (MW-2-16, MW-3-16 and MW-6-16). The limited plume migration could be attributed to the tight nature of the saprolite formation at the Site. In addition, little to no potential for off-site plume migration is observed based on available groundwater data at the downgradient locations. Due to no groundwater use at the Site and in the vicinity of the Site, there is no exposure pathway to human health.

5. Certification

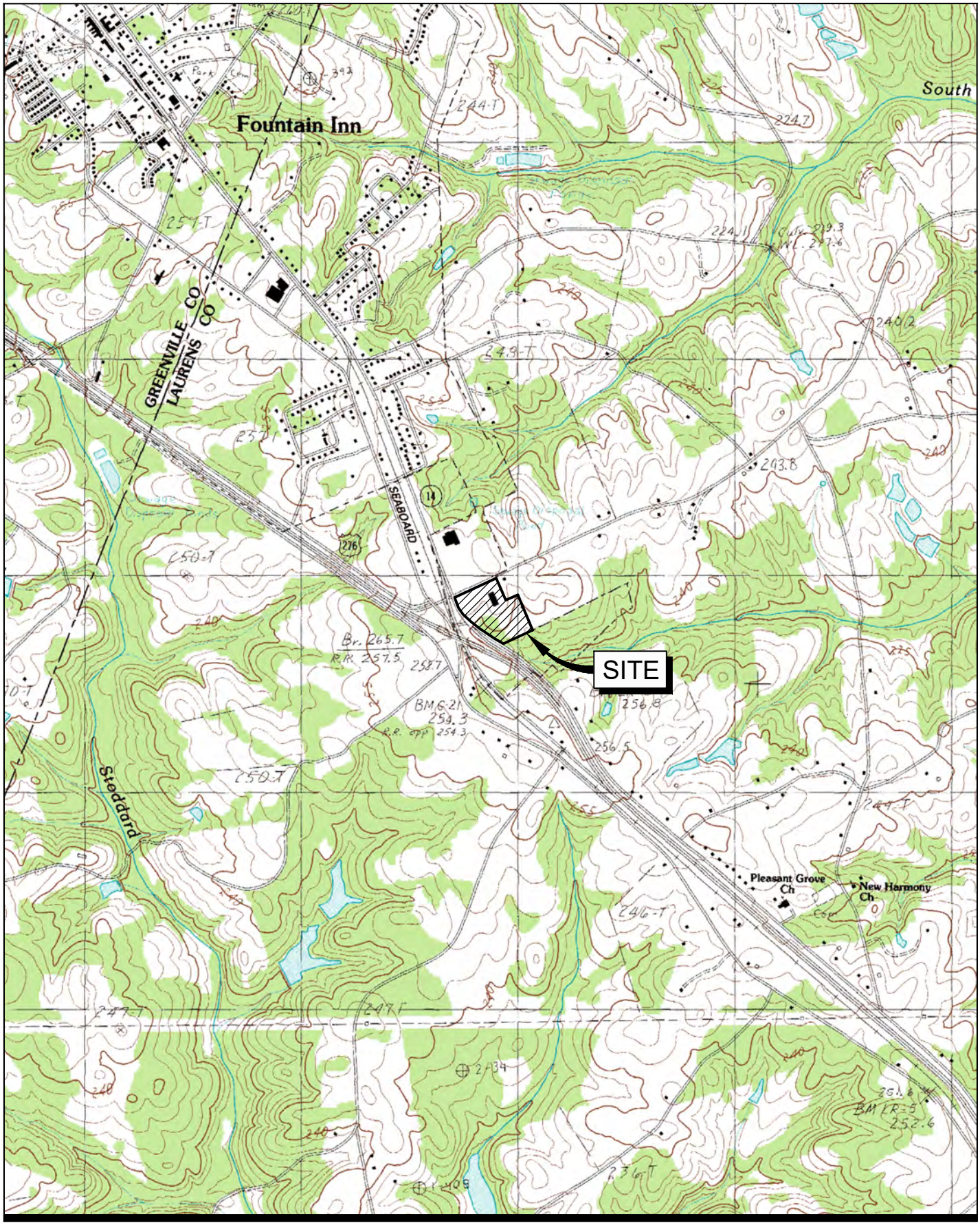
Professional Geologist Statement

I certify that I am a qualified groundwater scientist who has received a baccalaureate or postgraduate degree in the natural sciences or engineering, and have sufficient training and experience in groundwater hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound professional judgments regarding groundwater monitoring and contaminant fate and transport. I further certify that this Pilot Scale ISCO Injection Report was prepared in conjunction with others working under my direction.

Terefe Mazengia, PG #2573
Printed Name (Professional Geologist)

5/14/2021
Signature (Professional Geologist)

Figures



0 1000 2000 ft

N

GHD

BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

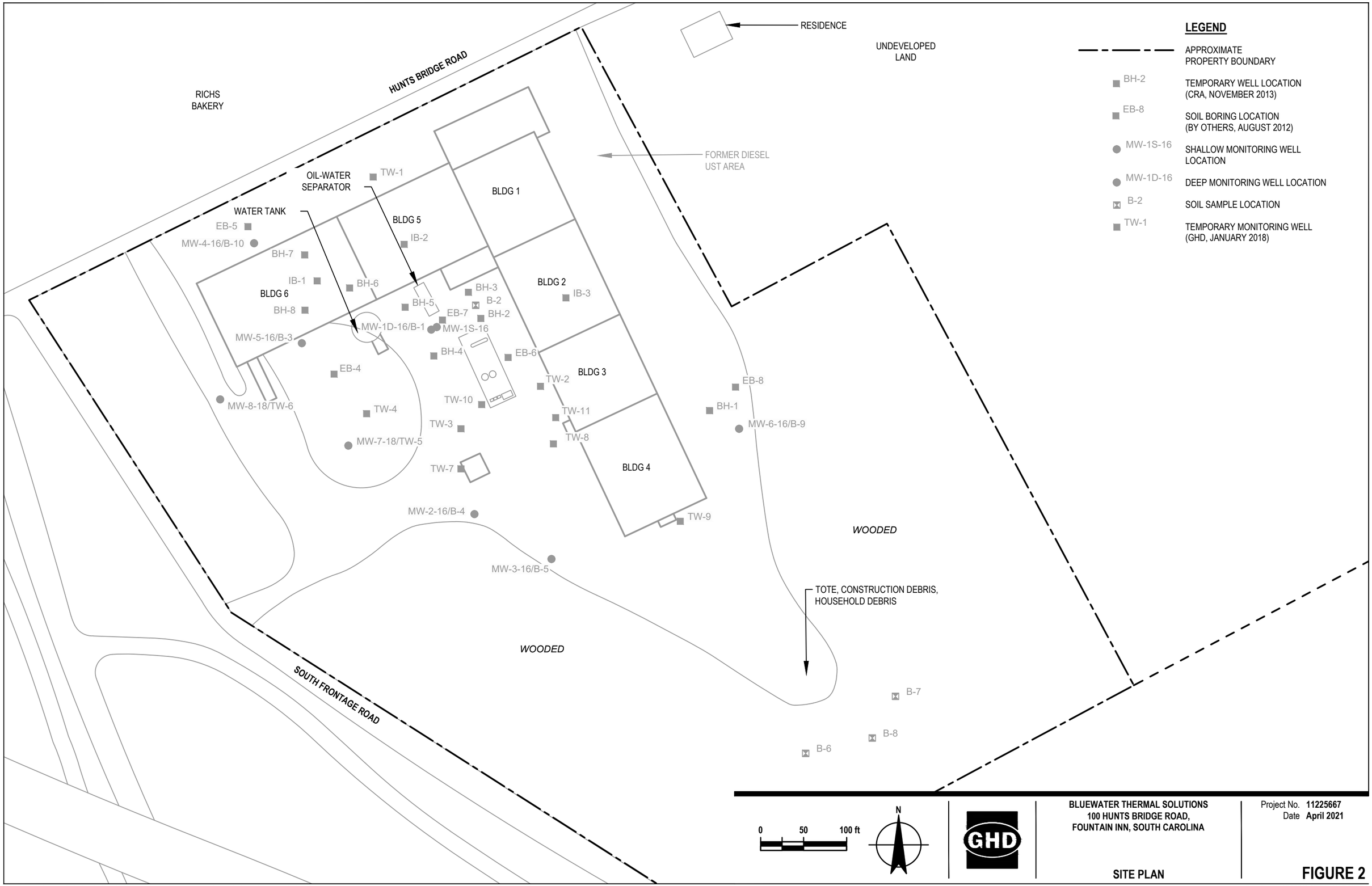
Project No. **11225667**
Date **April 2021**

SITE LOCATION MAP

FIGURE 1

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0101_WA-013.dwg
Plot Date: 07 April 2021 12:27 PM

Data Source: USGS QUADRANGLE MAP; FOUNTAIN INN, SOUTH CAROLINA.



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

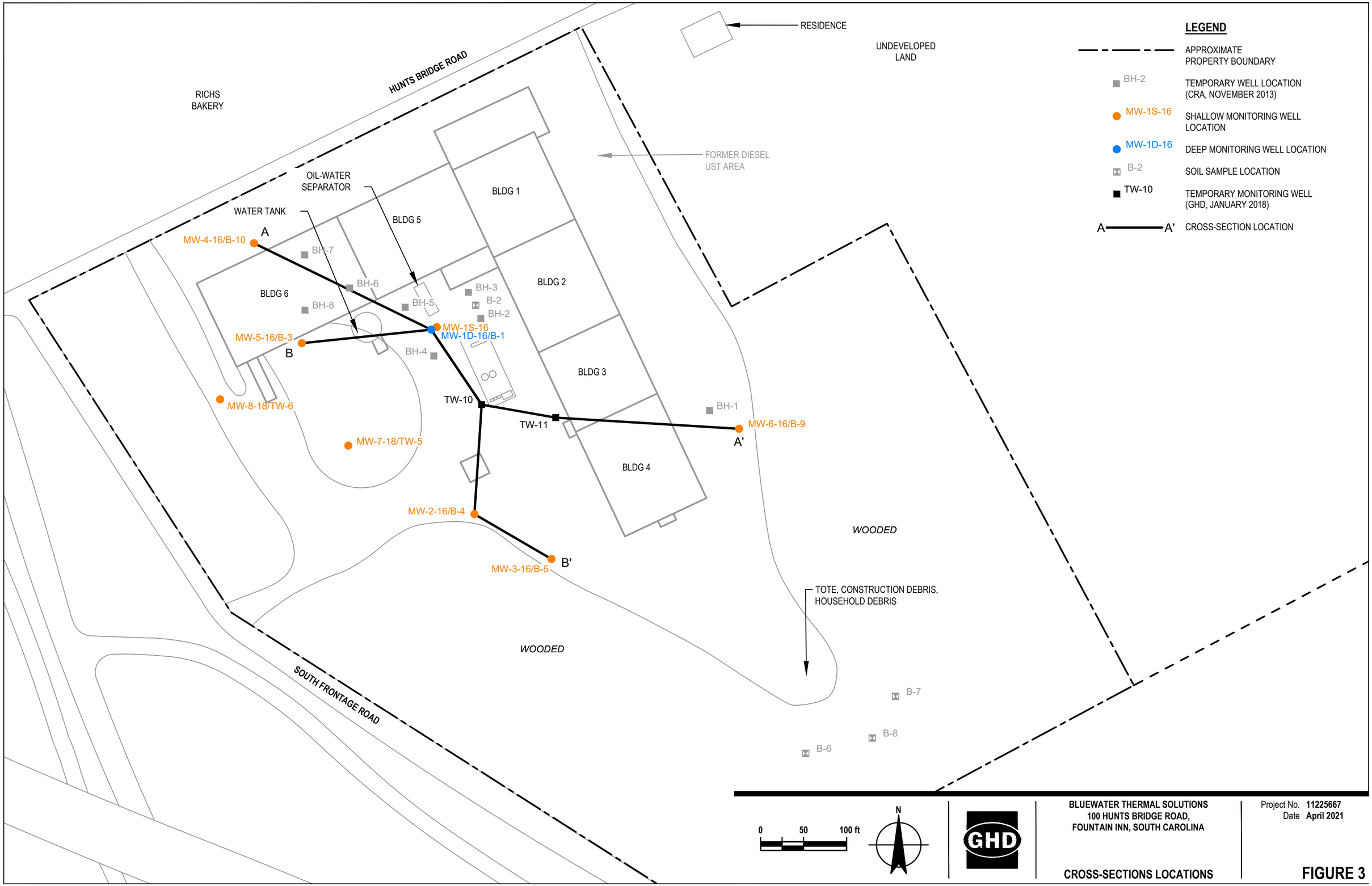
Project No. **11225667**
Date **April 2021**

SITE PLAN

FIGURE 2

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0102_WA-013.dwg
Plot Date: 07 April 2021 12:27 PM

Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

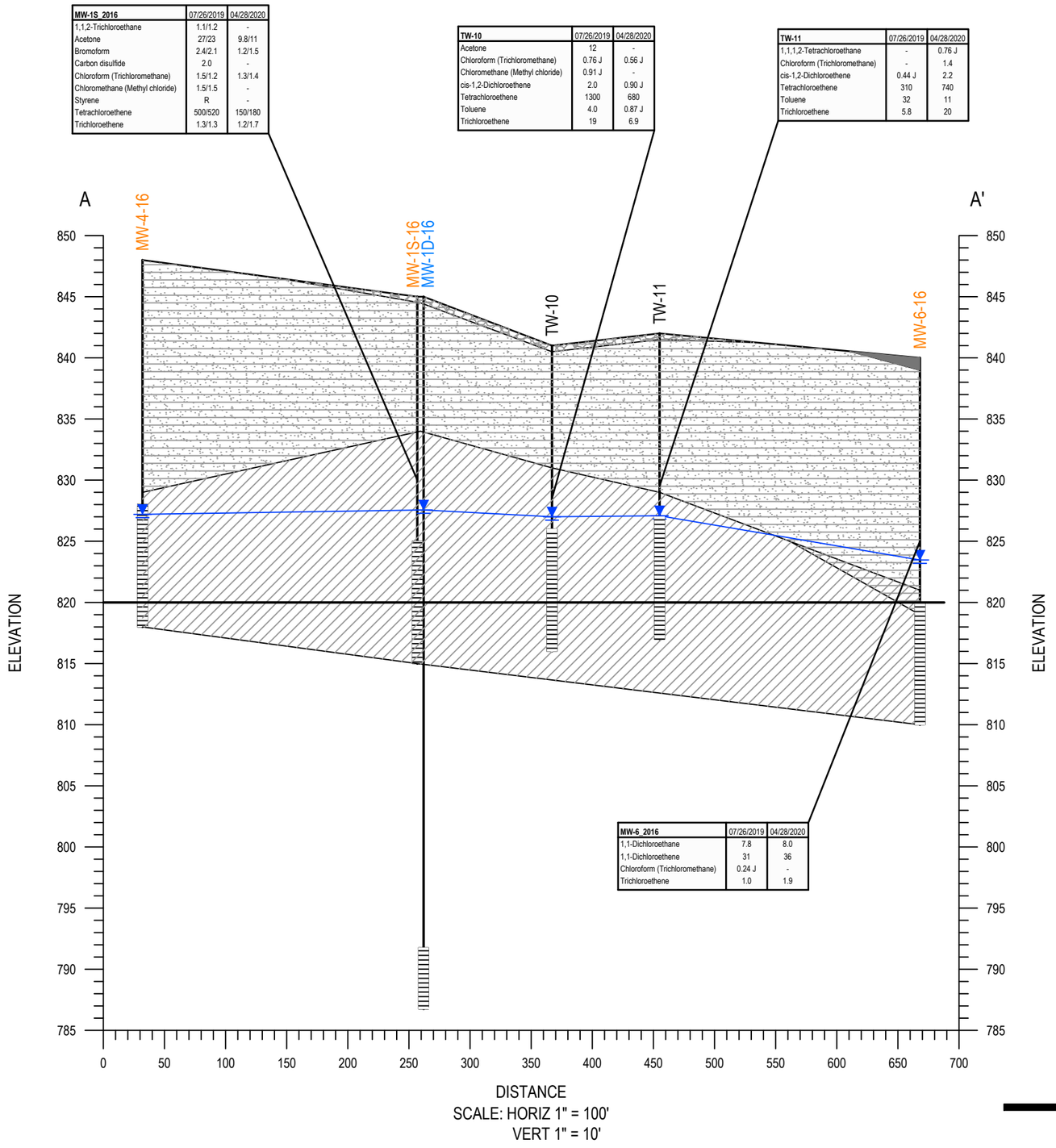
Project No. **11225667**
Date **April 2021**

CROSS-SECTIONS LOCATIONS

FIGURE 3

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0103_WA-013.dwg
Plot Date: 07 April 2021 12:27 PM

Data Source: ARCADIS SITE PLAN FIGURE 2



MW-1S_2016	07/26/2019	04/28/2020
1,1,2-Trichloroethane	1.1/1.2	-
Acetone	27/23	9.8/11
Bromoform	2.4/2.1	1.2/1.5
Carbon disulfide	2.0	-
Chloroform (Trichloromethane)	1.5/1.2	1.3/1.4
Chloromethane (Methyl chloride)	1.5/1.5	-
Styrene	R	-
Tetrachloroethene	500/520	150/180
Trichloroethene	1.3/1.3	1.2/1.7

TW-10	07/26/2019	04/28/2020
Acetone	12	-
Chloroform (Trichloromethane)	0.76 J	0.56 J
Chloromethane (Methyl chloride)	0.91 J	-
cis-1,2-Dichloroethene	2.0	0.90 J
Tetrachloroethene	1300	680
Toluene	4.0	0.87 J
Trichloroethene	19	6.9

TW-11	07/26/2019	04/28/2020
1,1,1,2-Tetrachloroethane	-	0.76 J
Chloroform (Trichloromethane)	-	1.4
cis-1,2-Dichloroethene	0.44 J	2.2
Tetrachloroethene	310	740
Toluene	32	11
Trichloroethene	5.8	20

MW-6_2016	07/26/2019	04/28/2020
1,1-Dichloroethane	7.8	8.0
1,1-Dichloroethene	31	36
Chloroform (Trichloromethane)	0.24 J	-
Trichloroethene	1.0	1.9

LEGEND

MW-6-16 — WELL DESIGNATION

GROUND SURFACE

MONITORING WELL INSTALLATION

JULY 26, 2019 GROUNDWATER ELEVATION

SCREENED INTERVAL

NOTE: TOC/GS ELEVATIONS OF TW-10 AND TW-11 ARE APPROXIMATE BASED ON NEIGHBORING WELLS.

ASPHALT

GRAVEL

SILTY SAND/SAND/SILT

CLAY

SAPROLITE (HIGHLY WEATHERED BEDROCK)

MW-6_2016	07/26/2019	04/28/2020
1,1-Dichloroethane	7.8	8.0
1,1-Dichloroethene	31	36
Chloroform (Trichloromethane)	0.24 J	-
Trichloroethene	1.0	1.9

SAMPLE LOCATION

SAMPLE DATE

SAMPLE RESULT

PARAMETER

chemical_name	Unit_ppb	Maximum_Contaminant_Levels_MCL	Tap_Water	Use_Crit
1,1,1,2-Tetrachloroethane	ug/L		0.57	0.57
1,1,2-Trichloroethane	ug/L	5	0.28	5
1,1-Dichloroethane	ug/L		2.8	2.8
1,1-Dichloroethene	ug/L	7	280	7
Acetone	ug/L		14000	14000
Bromoform	ug/L	80	3.3	80
Carbon disulfide	ug/L		810	810
Chloroform (Trichloromethane)	ug/L	80	0.22	80
Chloromethane (Methyl chloride)	ug/L		190	190
cis-1,2-Dichloroethene	ug/L	70	36	70
Styrene	ug/L	100	1200	100
Tetrachloroethene	ug/L	5	11	5
Toluene	ug/L	1000	1100	1000
Trichloroethene	ug/L	5	0.49	5

0 50 100 ft

N

GHD

BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

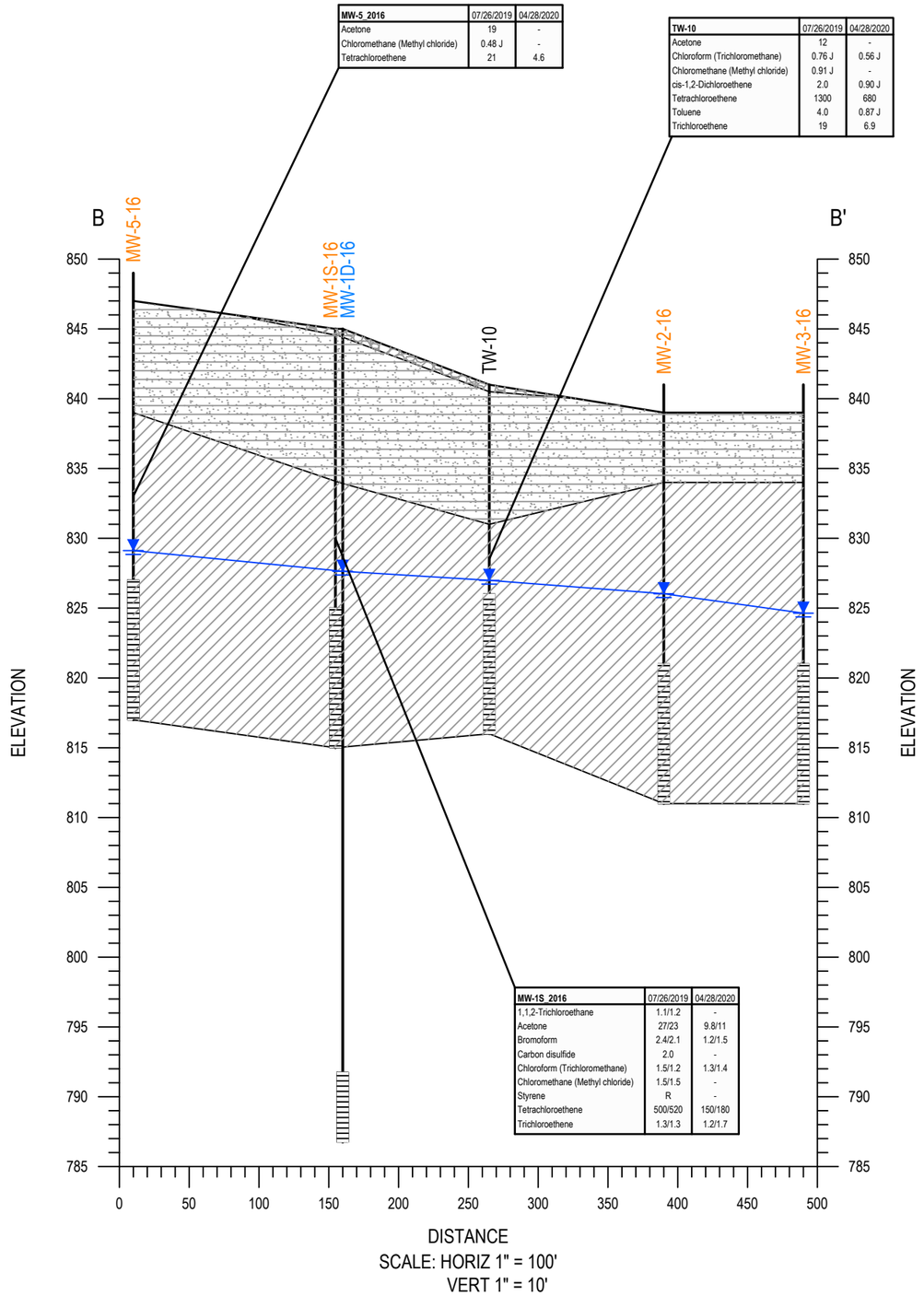
GEOLOGICAL CROSS-SECTION A-A'

Project No. **11225667**
Date **April 2021**

FIGURE 4

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0103_WA-013.dwg
Plot Date: 07 April 2021 12:27 PM

Data Source: ARCADIS SITE PLAN FIGURE 2

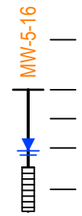


MW-5_2016	07/26/2019	04/28/2020
Acetone	19	-
Chloromethane (Methyl chloride)	0.48 J	-
Tetrachloroethene	21	4.6

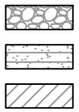
TW-10	07/26/2019	04/28/2020
Acetone	12	-
Chloroform (Trichloromethane)	0.76 J	0.56 J
Chloromethane (Methyl chloride)	0.91 J	-
cis-1,2-Dichloroethene	2.0	0.90 J
Tetrachloroethene	1300	680
Toluene	4.0	0.87 J
Trichloroethene	19	6.9

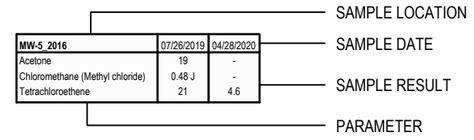
MW-1S_2016	07/26/2019	04/28/2020
1,1,2-Trichloroethane	1.1/1.2	-
Acetone	27/23	9.8/11
Bromoform	2.4/2.1	1.2/1.5
Carbon disulfide	2.0	-
Chloroform (Trichloromethane)	1.5/1.2	1.3/1.4
Chloromethane (Methyl chloride)	1.5/1.5	-
Styrene	R	-
Tetrachloroethene	500/520	150/180
Trichloroethene	1.3/1.3	1.2/1.7

LEGEND

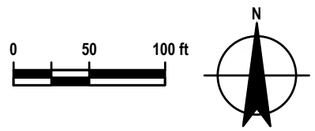


NOTE: TOC/GS ELEVATIONS OF TW-10 ARE APPROXIMATE BASED ON NEIGHBORING WELLS.





chemical_name	Unit_ppb	Maximum_Contaminant_Levels_MCL	Tap_Water	Use_Crit
1,1,1,2-Tetrachloroethane	ug/L		0.57	0.57
1,1,2-Trichloroethane	ug/L	5	0.28	5
1,1-Dichloroethane	ug/L		2.8	2.8
1,1-Dichloroethene	ug/L	7	280	7
Acetone	ug/L		14000	14000
Bromoform	ug/L	80	3.3	80
Carbon disulfide	ug/L		810	810
Chloroform (Trichloromethane)	ug/L	80	0.22	80
Chloromethane (Methyl chloride)	ug/L		190	190
cis-1,2-Dichloroethene	ug/L	70	36	70
Styrene	ug/L	100	1200	100
Tetrachloroethene	ug/L	5	11	5
Toluene	ug/L	1000	1100	1000
Trichloroethene	ug/L	5	0.49	5



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

Project No. **11225667**
Date **April 2021**

GEOLOGICAL CROSS-SECTION B-B'

FIGURE 5

Filename: \\ghdnetghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0103_WA-013.dwg
Plot Date: 07 April 2021 12:27 PM

Data Source: ARCADIS SITE PLAN FIGURE 2

RESIDENCE

UNDEVELOPED LAND

HUNTS BRIDGE ROAD

RICHS BAKERY

FORMER DIESEL UST AREA

OIL-WATER SEPARATOR

WATER TANK

BLDG 5

BLDG 6

TW-1'

MW-4-16/B-10

BH-7

BH-6

BH-8

BH-5

BH-3

B-2

BH-2

MW-1D-16/B-1

MW-1S-16

MW-5-16/B-3

BH-4

TW-2'

TW-10

MW-8-18/TW-6

TW-4'

TW-3'

TW-11

TW-8'

MW-7-18/TW-5

TW-7'

MW-2-16/B-4

TW-9'

MW-3-16/B-5

BH-1

MW-6-16/B-9

WOODED

WOODED

TOTE, CONSTRUCTION DEBRIS, HOUSEHOLD DEBRIS

B-7

B-8

B-6

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- BH-2 — TEMPORARY WELL LOCATION (CRA, NOVEMBER 2013)
- MW-1S-16 — SHALLOW MONITORING WELL LOCATION
- MW-1D-16 — DEEP MONITORING WELL LOCATION
- B-2 — SOIL SAMPLE LOCATION
- TW-1' — TEMPORARY MONITORING WELL (GHD, JANUARY 2018) ABANDONED
- TW-10 — TEMPORARY MONITORING WELL (GHD, JANUARY 2019)

NOTE:
TEMPORARY WELLS TW-1 THROUGH TW-9 WERE SAMPLED FOR COLOR TECH MEASUREMENTS ONLY. ALL TEMPORARY WELLS WERE ABANDONED AFTER SAMPLING.

0 50 100 ft

N

GHD

BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

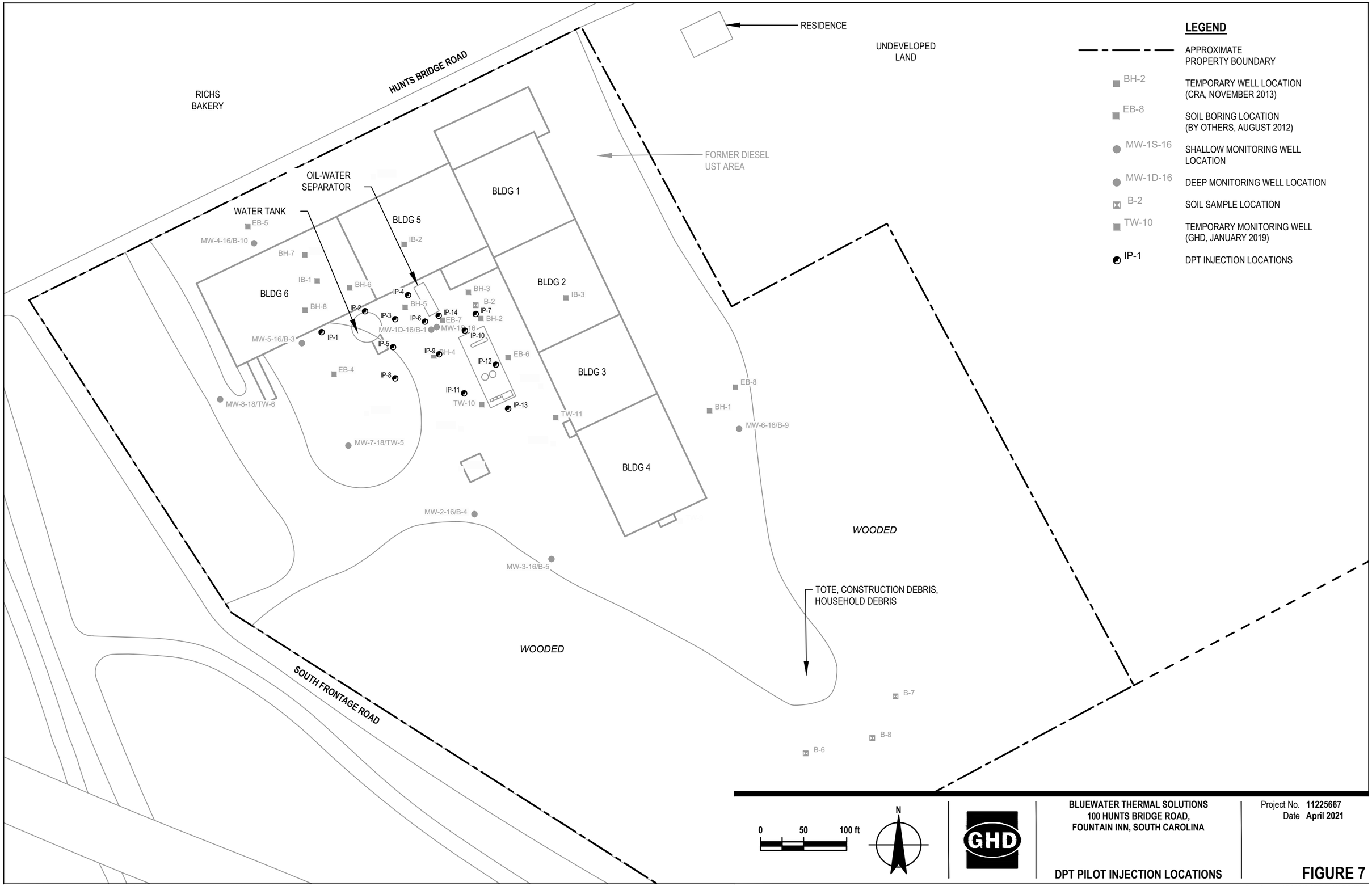
MONITORING WELL LOCATIONS

Project No. **11225667**
Date **April 2021**

FIGURE 6

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0104_WA-013.dwg
Plot Date: 07 April 2021 12:27 PM

Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

Project No. **11225667**
Date **April 2021**

DPT PILOT INJECTION LOCATIONS

FIGURE 7

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0105_WA-013.dwg
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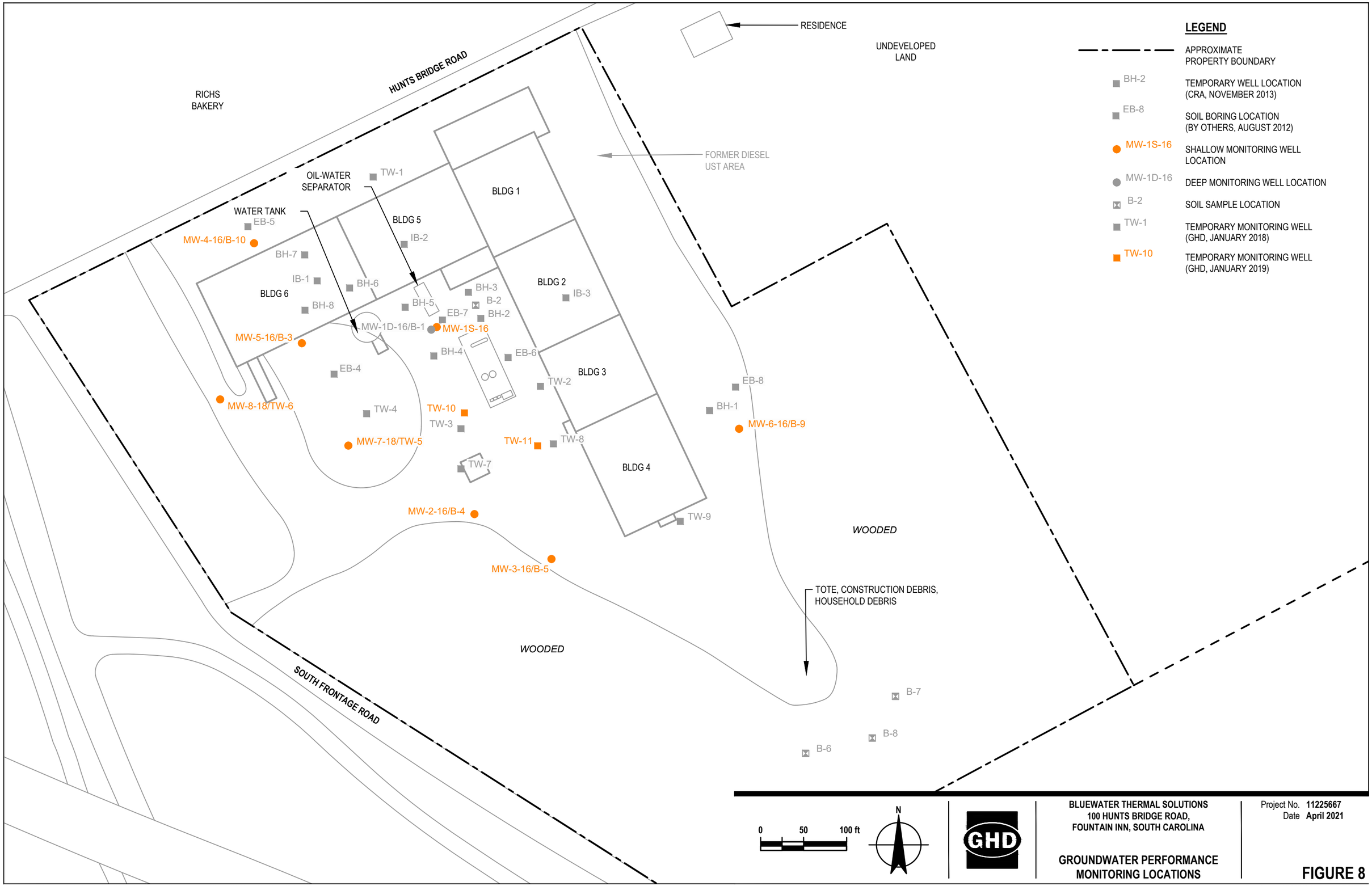
Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

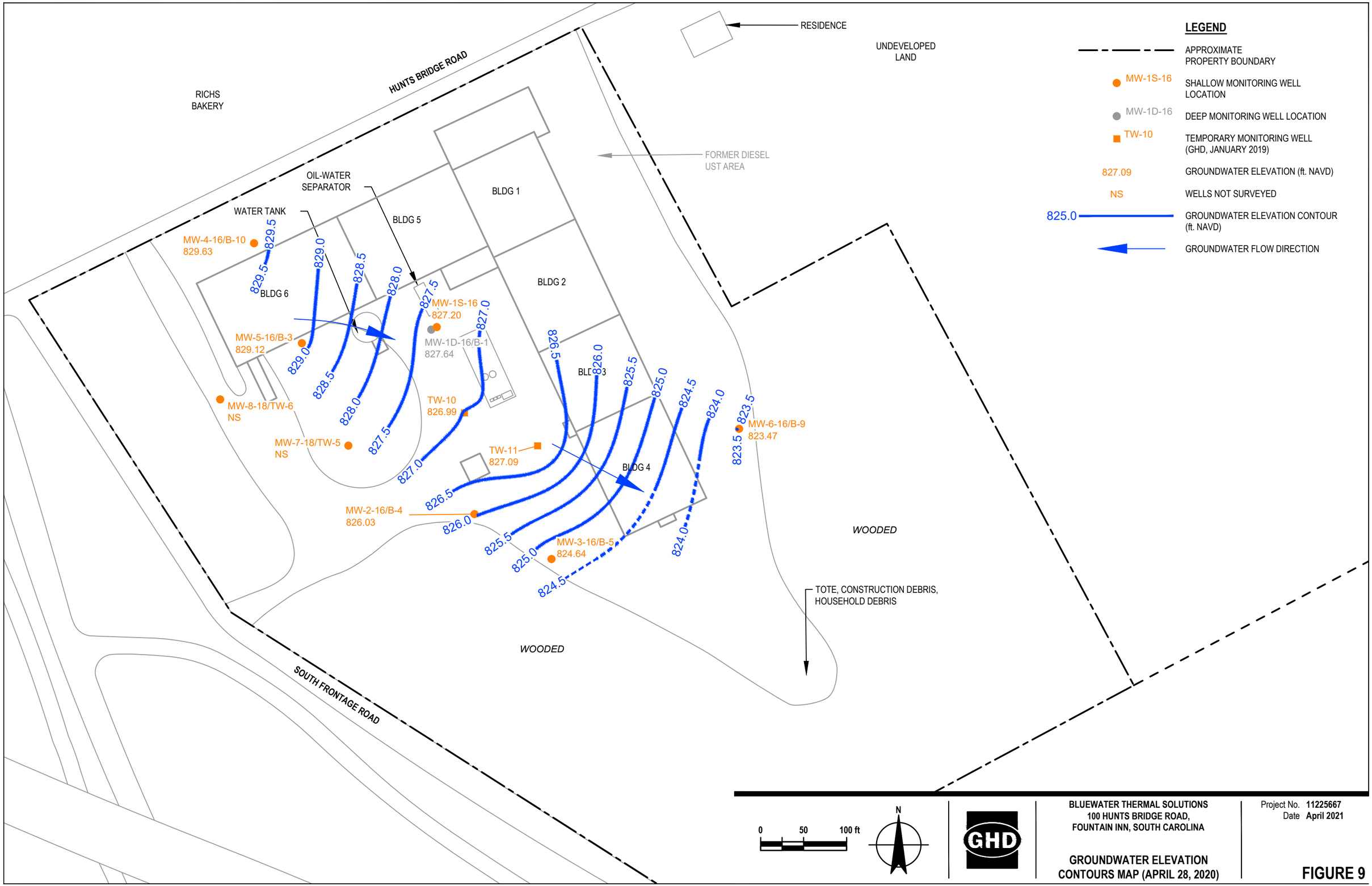
GROUNDWATER PERFORMANCE MONITORING LOCATIONS

Project No. **11225667**
Date **April 2021**

FIGURE 8

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0106_WA-013.dwg
Plot Date: 07 April 2021 12:28 PM

Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

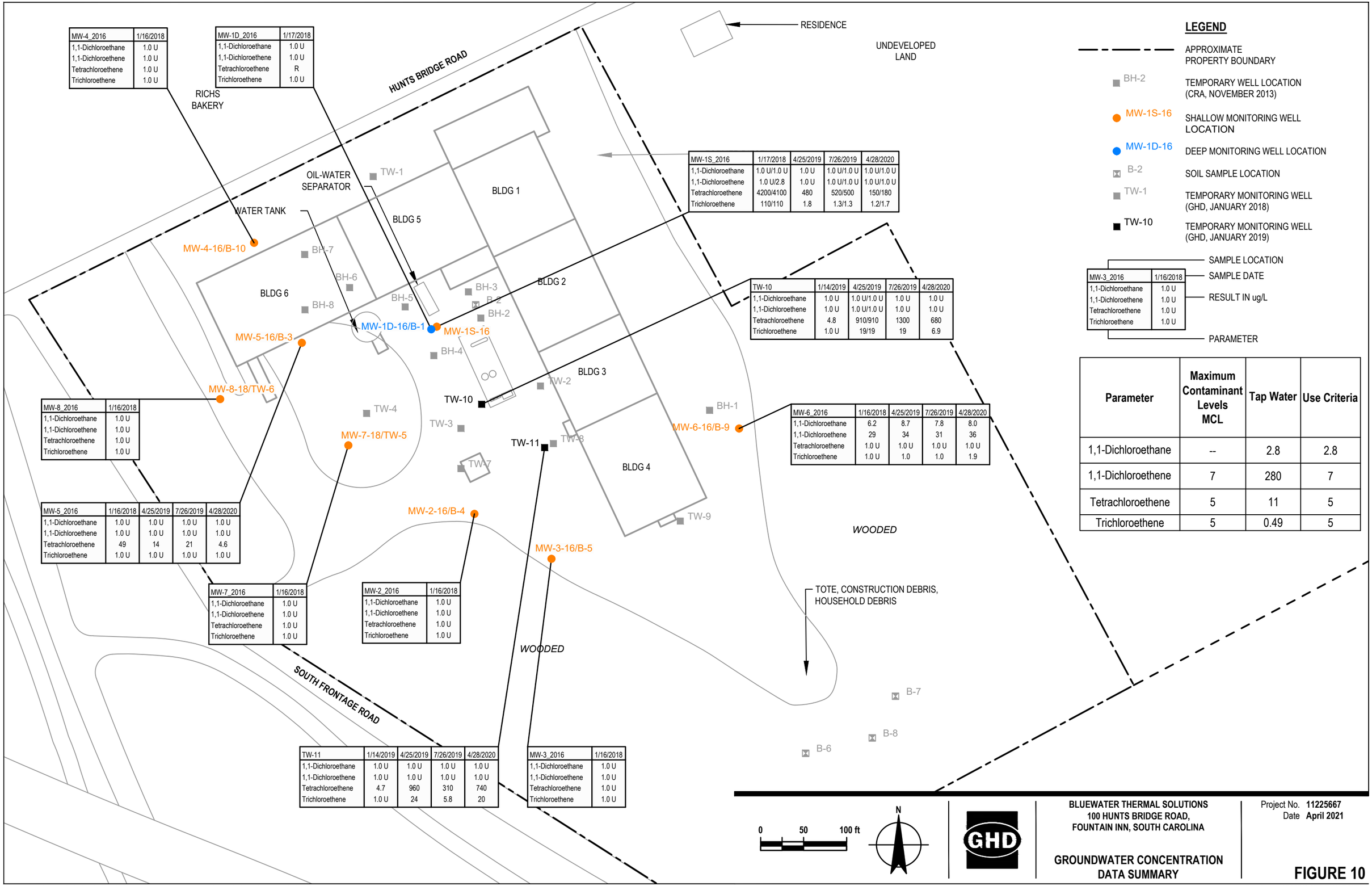
GROUNDWATER ELEVATION CONTOURS MAP (APRIL 28, 2020)

Project No. **11225667**
Date **April 2021**

FIGURE 9

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0107_WA-013.dwg
Plot Date: 07 April 2021 12:28 PM

Data Source: ARCADIS SITE PLAN FIGURE 2



MW-4_2016	1/16/2018
1,1-Dichloroethane	1.0 U
1,1-Dichloroethene	1.0 U
Tetrachloroethene	1.0 U
Trichloroethene	1.0 U

MW-1D_2016	1/17/2018
1,1-Dichloroethane	1.0 U
1,1-Dichloroethene	1.0 U
Tetrachloroethene	R
Trichloroethene	1.0 U

MW-1S_2016	1/17/2018	4/25/2019	7/26/2019	4/28/2020
1,1-Dichloroethane	1.0 U/1.0 U	1.0 U	1.0 U/1.0 U	1.0 U/1.0 U
1,1-Dichloroethene	1.0 U/2.8	1.0 U	1.0 U/1.0 U	1.0 U/1.0 U
Tetrachloroethene	4200/4100	480	520/500	150/180
Trichloroethene	110/110	1.8	1.3/1.3	1.2/1.7

TW-10	1/14/2019	4/25/2019	7/26/2019	4/28/2020
1,1-Dichloroethane	1.0 U	1.0 U/1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	1.0 U	1.0 U/1.0 U	1.0 U	1.0 U
Tetrachloroethene	4.8	910/910	1300	680
Trichloroethene	1.0 U	19/19	19	6.9

MW-6_2016	1/16/2018	4/25/2019	7/26/2019	4/28/2020
1,1-Dichloroethane	6.2	8.7	7.8	8.0
1,1-Dichloroethene	29	34	31	36
Tetrachloroethene	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	1.0 U	1.0	1.0	1.9

MW-8_2016	1/16/2018
1,1-Dichloroethane	1.0 U
1,1-Dichloroethene	1.0 U
Tetrachloroethene	1.0 U
Trichloroethene	1.0 U

MW-5_2016	1/16/2018	4/25/2019	7/26/2019	4/28/2020
1,1-Dichloroethane	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	49	14	21	4.6
Trichloroethene	1.0 U	1.0 U	1.0 U	1.0 U

MW-7_2016	1/16/2018
1,1-Dichloroethane	1.0 U
1,1-Dichloroethene	1.0 U
Tetrachloroethene	1.0 U
Trichloroethene	1.0 U

MW-2_2016	1/16/2018
1,1-Dichloroethane	1.0 U
1,1-Dichloroethene	1.0 U
Tetrachloroethene	1.0 U
Trichloroethene	1.0 U

TW-11	1/14/2019	4/25/2019	7/26/2019	4/28/2020
1,1-Dichloroethane	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	4.7	960	310	740
Trichloroethene	1.0 U	24	5.8	20

MW-3_2016	1/16/2018
1,1-Dichloroethane	1.0 U
1,1-Dichloroethene	1.0 U
Tetrachloroethene	1.0 U
Trichloroethene	1.0 U

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- BH-2 — TEMPORARY WELL LOCATION (CRA, NOVEMBER 2013)
- MW-1S-16 — SHALLOW MONITORING WELL LOCATION
- MW-1D-16 — DEEP MONITORING WELL LOCATION
- B-2 — SOIL SAMPLE LOCATION
- TW-1 — TEMPORARY MONITORING WELL (GHD, JANUARY 2018)
- TW-10 — TEMPORARY MONITORING WELL (GHD, JANUARY 2019)

MW-3_2016	1/16/2018
1,1-Dichloroethane	1.0 U
1,1-Dichloroethene	1.0 U
Tetrachloroethene	1.0 U
Trichloroethene	1.0 U

SAMPLE LOCATION
SAMPLE DATE
RESULT IN ug/L
PARAMETER

Parameter	Maximum Contaminant Levels MCL	Tap Water	Use Criteria
1,1-Dichloroethane	--	2.8	2.8
1,1-Dichloroethene	7	280	7
Tetrachloroethene	5	11	5
Trichloroethene	5	0.49	5

0 50 100 ft

N

GHD

BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

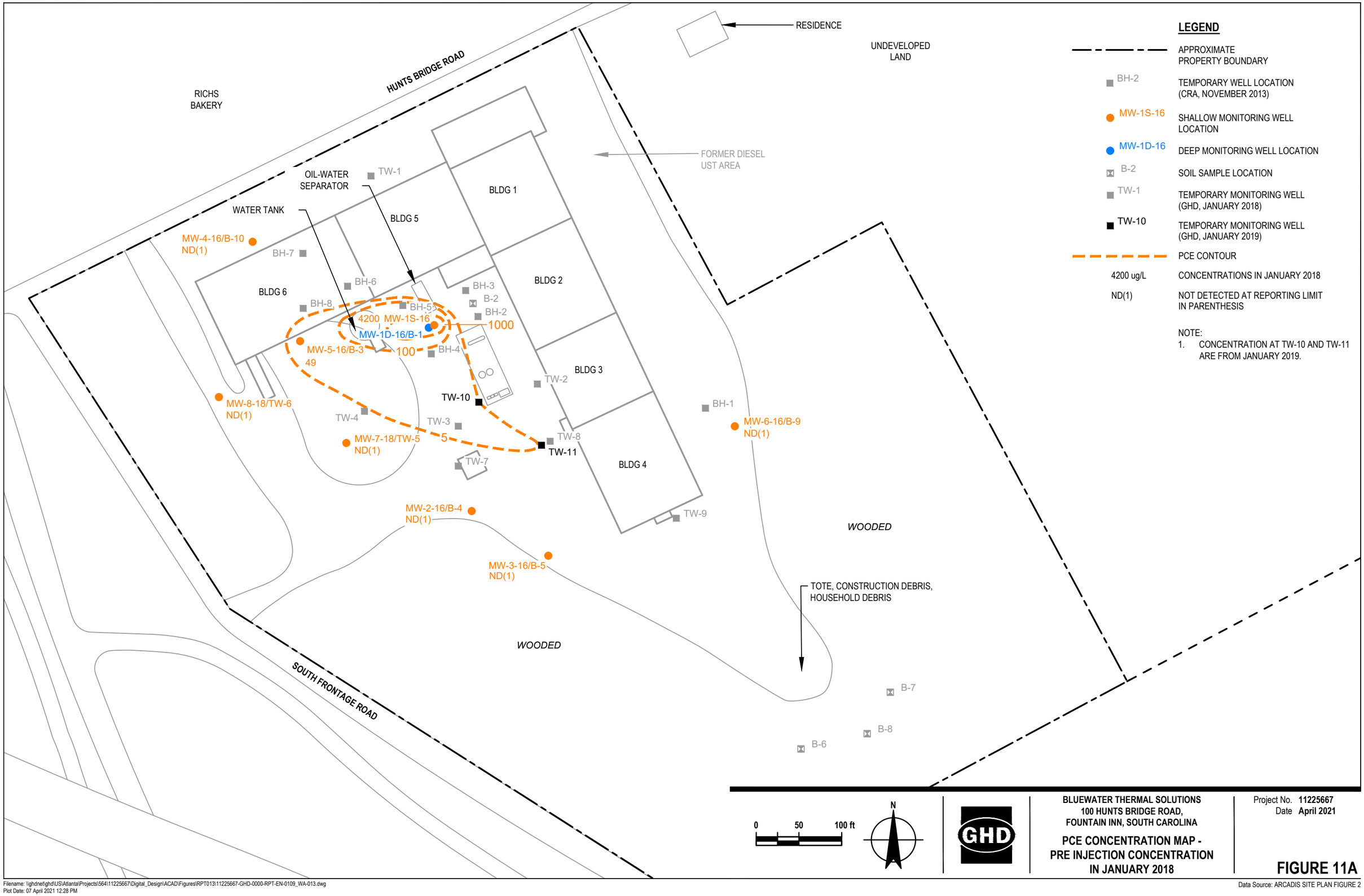
GROUNDWATER CONCENTRATION DATA SUMMARY

Project No. **11225667**
Date **April 2021**

FIGURE 10

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0108_WA-013.dwg
Plot Date: 07 April 2021 12:28 PM

Data Source: ARCADIS SITE PLAN FIGURE 2



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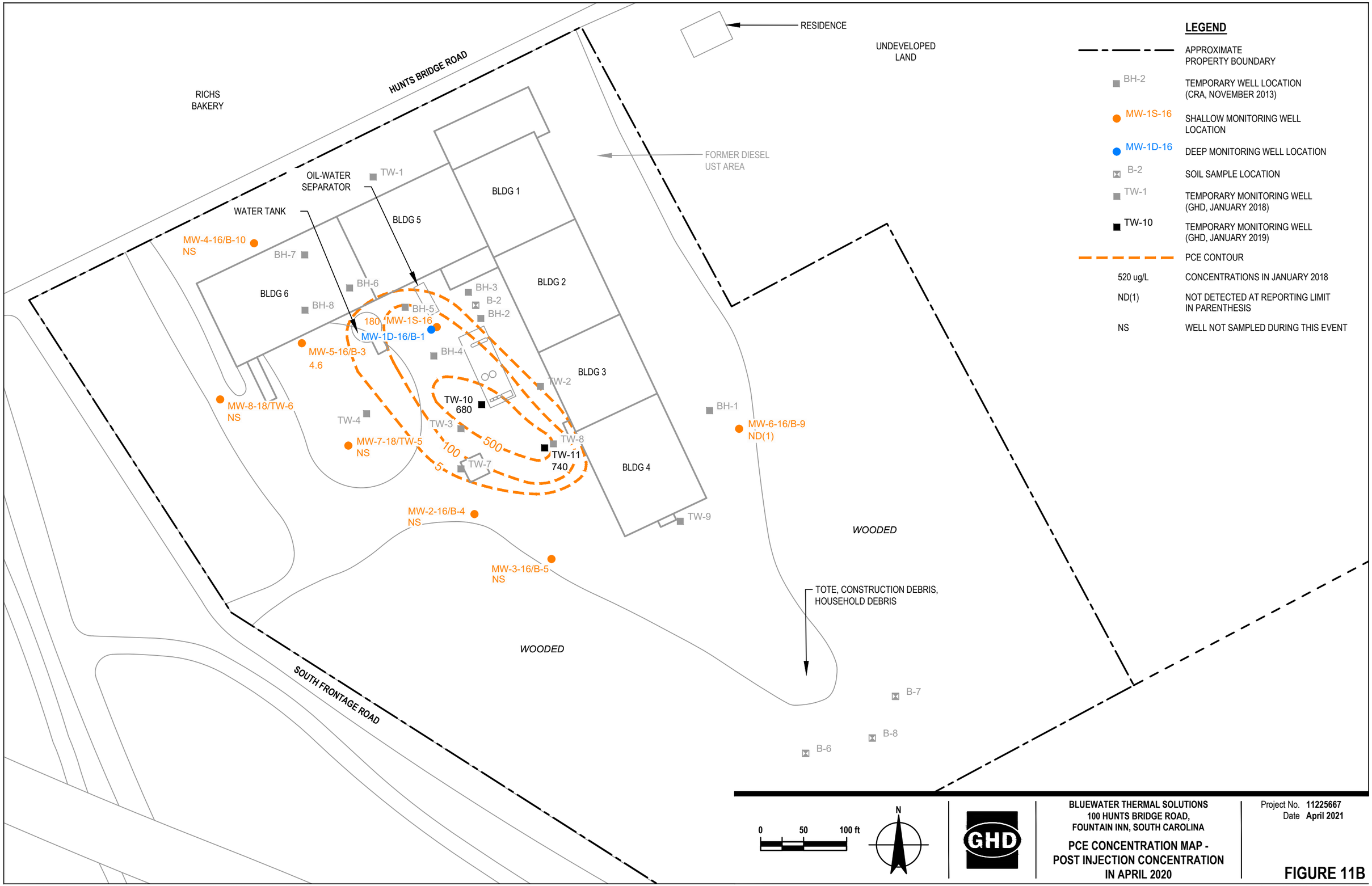


GHD

BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

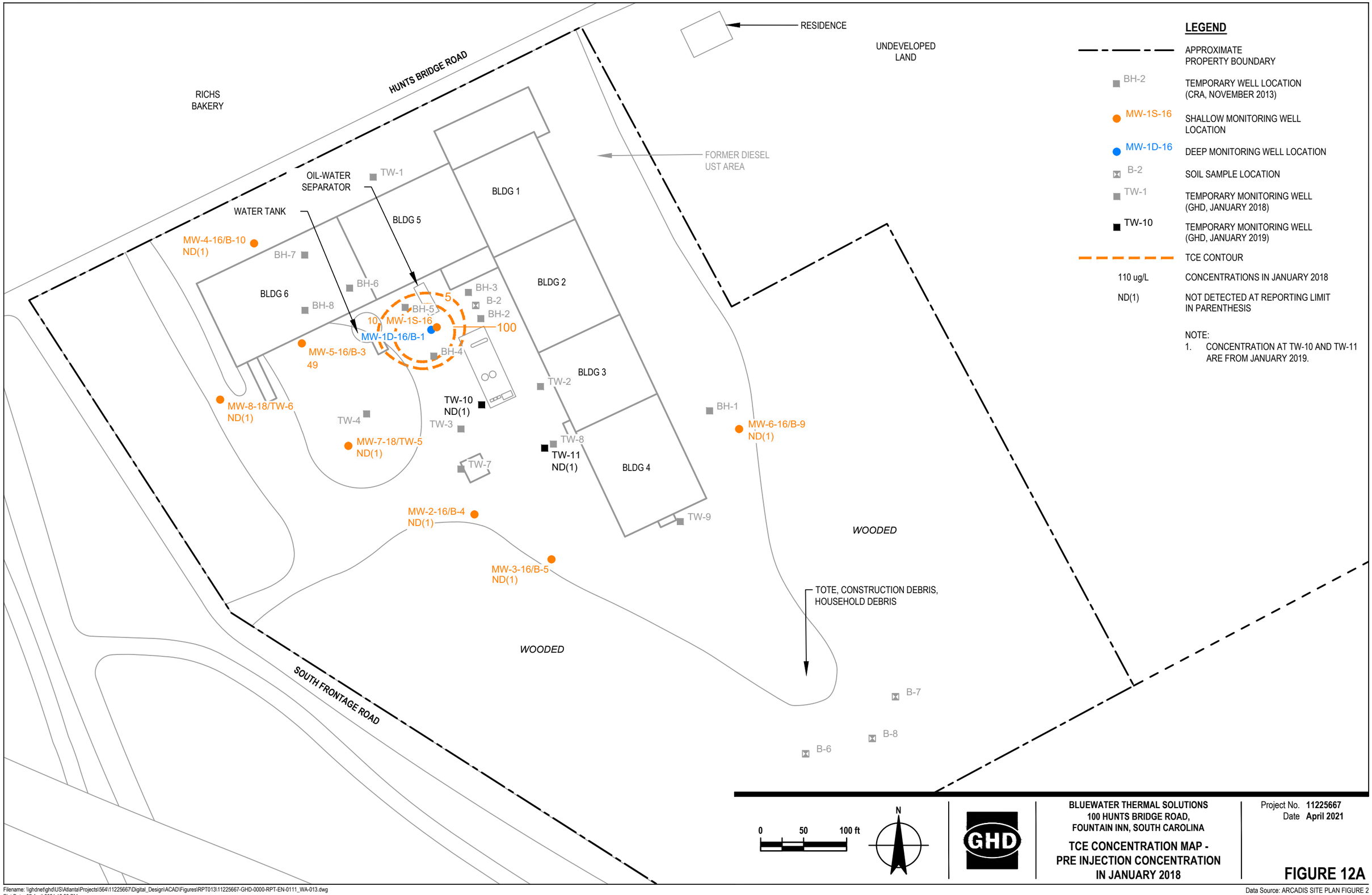
PCE CONCENTRATION MAP - POST INJECTION CONCENTRATION IN APRIL 2020

Project No. **11225667**
Date **April 2021**

FIGURE 11B

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0110_WA-013.dwg
Plot Date: 07 April 2021 12:28 PM

Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

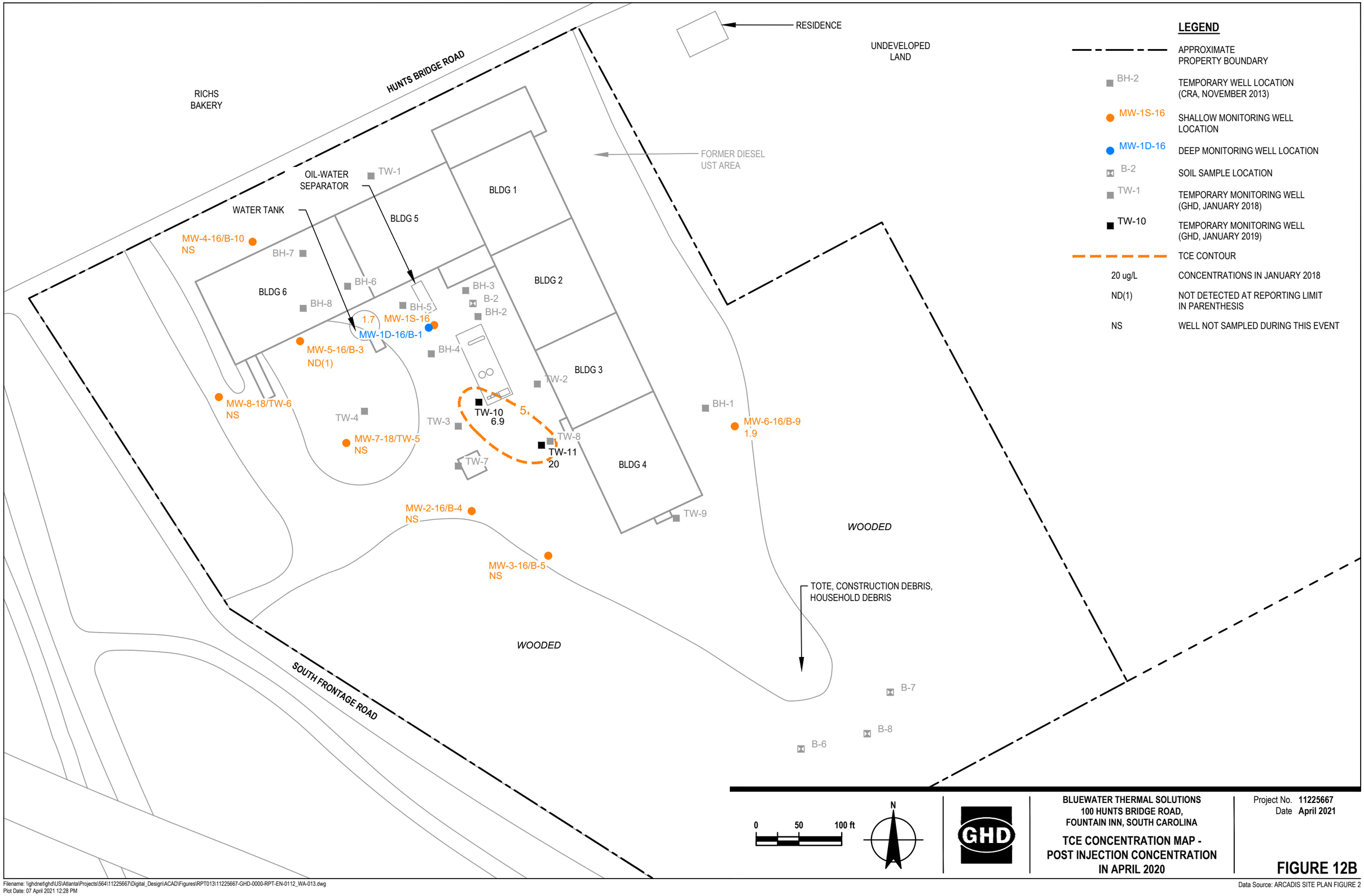
TCE CONCENTRATION MAP - PRE INJECTION CONCENTRATION IN JANUARY 2018

Project No. **11225667**
Date **April 2021**

FIGURE 12A

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0111_WA-013.dwg
Plot Date: 07 April 2021 12:28 PM

Data Source: ARCADIS SITE PLAN FIGURE 2



BLUEWATER THERMAL SOLUTIONS
100 HUNTS BRIDGE ROAD,
FOUNTAIN INN, SOUTH CAROLINA

TCE CONCENTRATION MAP - POST INJECTION CONCENTRATION IN APRIL 2020

Project No. **11225667**
Date **April 2021**

FIGURE 12B

Filename: \\ghdnet\ghd\US\Atlanta\Projects\564\11225667\Digital_Design\ACAD\Figures\RPT013\11225667-GHD-0000-RPT-EN-0112_WA-013.dwg
Plot Date: 07 April 2021 12:28 PM

Data Source: ARCADIS SITE PLAN FIGURE 2

Tables

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:					BH-1	BH-2	BH-3	BH-4	BH-5	BH-5	BH-6
Sample ID:					GW-077150-110713-AWY-106	GW-077150-110713-AWY-102	GW-077150-110713-AWY-103	GW-077150-110613-AWY-101	GW-077150-110713-AWY-104	GW-077150-110713-AWY-105	GW-077150-110713-AWY-107
Sample Date:					11/7/2013	11/7/2013	11/7/2013	11/6/2013	11/7/2013	11/7/2013 (Duplicate)	11/7/2013
Parameters	Units	EPA MCL April 2019	EPA Tapwater April 2019	Criteria Used April 2019							
Field Parameters											
VOCs											
1,1,1,2-Tetrachloroethane	ug/L	--	0.57	0.57	--	--	--	--	--	--	--
1,1,1-Trichloroethane	ug/L	200	8000	200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	--	0.076	0.076	1.0 U	1.0 U	1.0 U	**11**	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	ug/L	5	0.28	5	1.0 U	1.0 U	**6.9**	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L	--	2.8	2.8	**6.9**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	7	280	7	**10**	2.0 U	2.0 U	2.2	2.5	2.5	2.0 U
1,2,4-Trichlorobenzene	ug/L	70	1.2	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	0.2	0.00033	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	0.05	0.0075	0.05	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	600	300	600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	5	0.17	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	5	0.85	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	--	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	75	0.48	75	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	--	5600	5600	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	ug/L	--	38	38	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	--	6300	6300	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	ug/L	--	14000	14000	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Benzene	ug/L	5	0.46	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	80	0.13	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	80	3.3	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	ug/L	--	7.5	7.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	ug/L	--	810	810	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon tetrachloride	ug/L	5	0.46	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chlorobenzene	ug/L	100	78	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L	--	21000	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	ug/L	80	0.22	80	1.0 U	1.0 U	1.0 U	9.5	4.2	4.3	1.0 U
Chloromethane (Methyl chloride)	ug/L	--	190	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	70	36	70	1.0 U	1.0 U	3.0	21	23	23	1.0 U
cis-1,3-Dichloropropene	ug/L	--	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L	--	13000	13000	1.4 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	ug/L	80	0.87	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	--	200	200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	700	1.5	700	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	ug/L	--	450	450	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	ug/L	--	20000	20000	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl cyclohexane	ug/L	--	--	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert butyl ether (MTBE)	ug/L	--	14	14	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	5	11	5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Styrene	ug/L	100	1200	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	5	11	5	1.0 U	2.8	**100**	**4600**	**3200 J**	**2700**	**690**
Toluene	ug/L	1000	1100	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	ug/L	100	360	100	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
trans-1,3-Dichloropropene	ug/L	--	--	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Trichloroethene	ug/L	5	0.49	5	1.0 U	1.0 U	2.9	**150**	**120**	**110**	**11**
Trichlorofluoromethane (CFC-11)	ug/L	--	5200	5200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L	--	10000	10000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Vinyl chloride	ug/L	2	0.019	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	10000	190	10000	1.0 U	1.0 U	1.3	1.0 U	1.0 U	1.0 U	1.0 U

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:					BH-1	BH-2	BH-3	BH-4	BH-5	BH-5	BH-6
Sample ID:					GW-077150-110713-AWY-106	GW-077150-110713-AWY-102	GW-077150-110713-AWY-103	GW-077150-110613-AWY-101	GW-077150-110713-AWY-104	GW-077150-110713-AWY-105	GW-077150-110713-AWY-107
Sample Date:					11/7/2013	11/7/2013	11/7/2013	11/6/2013	11/7/2013	11/7/2013 (Duplicate)	11/7/2013
Parameters	Units	EPA MCL April 2019	EPA Tapwater April 2019	Criteria Used April 2019							
SVOCs											
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	--	710	710	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	ug/L	--	1200	1200	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	ug/L	--	4.1	4.1	--	--	--	--	--	--	--
2,4-Dichlorophenol	ug/L	--	46	46	--	--	--	--	--	--	--
2,4-Dimethylphenol	ug/L	--	360	360	--	--	--	--	--	--	--
2,4-Dinitrophenol	ug/L	--	39	39	--	--	--	--	--	--	--
2,4-Dinitrotoluene	ug/L	--	0.24	0.24	--	--	--	--	--	--	--
2,6-Dinitrotoluene	ug/L	--	0.049	0.049	--	--	--	--	--	--	--
2-Chloronaphthalene	ug/L	--	750	750	--	--	--	--	--	--	--
2-Chlorophenol	ug/L	--	91	91	--	--	--	--	--	--	--
2-Methylnaphthalene	ug/L	--	36	36	--	--	--	--	--	--	--
2-Methylphenol	ug/L	--	930	930	--	--	--	--	--	--	--
2-Nitroaniline	ug/L	--	190	190	--	--	--	--	--	--	--
2-Nitrophenol	ug/L	--	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	ug/L	--	0.13	0.13	--	--	--	--	--	--	--
3-Nitroaniline	ug/L	--	--	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	ug/L	--	1.5	1.5	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	ug/L	--	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	ug/L	--	1400	1400	--	--	--	--	--	--	--
4-Chloroaniline	ug/L	--	0.37	0.37	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	ug/L	--	--	--	--	--	--	--	--	--	--
4-Methylphenol	ug/L	--	1900	1900	--	--	--	--	--	--	--
4-Nitroaniline	ug/L	--	3.8	3.8	--	--	--	--	--	--	--
4-Nitrophenol	ug/L	--	--	--	--	--	--	--	--	--	--
Acenaphthene	ug/L	--	530	530	--	--	--	--	--	--	--
Acenaphthylene	ug/L	--	--	--	--	--	--	--	--	--	--
Acetophenone	ug/L	--	1900	1900	--	--	--	--	--	--	--
Anthracene	ug/L	--	1800	1800	--	--	--	--	--	--	--
Atrazine	ug/L	3	0.3	3	--	--	--	--	--	--	--
Benzaldehyde	ug/L	--	19	19	--	--	--	--	--	--	--
Benzo(a)anthracene	ug/L	--	0.03	0.03	--	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	0.2	0.025	0.2	--	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L	--	0.25	0.25	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	ug/L	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L	--	2.5	2.5	--	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	ug/L	--	0.83	0.83	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	ug/L	--	59	59	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	ug/L	--	0.014	0.014	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	5.6	6	--	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	ug/L	--	16	16	--	--	--	--	--	--	--
Caprolactam	ug/L	--	9900	9900	--	--	--	--	--	--	--
Carbazole	ug/L	--	--	--	--	--	--	--	--	--	--
Chrysene	ug/L	--	25	25	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L	--	0.025	0.025	--	--	--	--	--	--	--
Dibenzofuran	ug/L	--	7.9	7.9	--	--	--	--	--	--	--
Diethyl phthalate	ug/L	--	15000	15000	--	--	--	--	--	--	--
Dimethyl phthalate	ug/L	--	--	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	ug/L	--	900	900	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	ug/L	--	200	200	--	--	--	--	--	--	--
Fluoranthene	ug/L	--	800	800	--	--	--	--	--	--	--
Fluorene	ug/L	--	290	290	--	--	--	--	--	--	--
Hexachlorobenzene	ug/L	1	0.0098	1	--	--	--	--	--	--	--
Hexachlorobutadiene	ug/L	--	0.14	0.14	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	ug/L	50	0.41	50	--	--	--	--	--	--	--
Hexachloroethane	ug/L	--	0.33	0.33	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L	--	0.25	0.25	--	--	--	--	--	--	--
Isophorone	ug/L	--	78	78	--	--	--	--	--	--	--
Naphthalene	ug/L	--	0.17	0.17	--	--	--	--	--	--	--
Nitrobenzene	ug/L	--	0.14	0.14	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	ug/L	--	0.011	0.011	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	ug/L	--	12	12	--	--	--	--	--	--	--
Pentachlorophenol	ug/L	1	0.041	1	--	--	--	--	--	--	--
Phenanthrene	ug/L	--	--	--	--	--	--	--	--	--	--
Phenol	ug/L	--	5800	5800	--	--	--	--	--	--	--
Pyrene	ug/L	--	120	120	--	--	--	--	--	--	--

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:					BH-1	BH-2	BH-3	BH-4	BH-5	BH-5	BH-6
Sample ID:					GW-077150-110713-AWY-106	GW-077150-110713-AWY-102	GW-077150-110713-AWY-103	GW-077150-110613-AWY-101	GW-077150-110713-AWY-104	GW-077150-110713-AWY-105	GW-077150-110713-AWY-107
Sample Date:					11/7/2013	11/7/2013	11/7/2013	11/6/2013	11/7/2013	11/7/2013 (Duplicate)	11/7/2013
Parameters	**Units**	**EPA MCL April 2019**	**EPA Tapwater April 2019**	**Criteria Used April 2019**							
Metals											
Aluminum	ug/L	--	20000	20000	--	--	--	--	--	--	--
Antimony	ug/L	6	7.8	6	--	--	--	--	--	--	--
Arsenic	ug/L	10	0.052	10	--	--	--	--	--	--	--
Barium	ug/L	2000	3800	2000	--	--	--	--	--	--	--
Beryllium	ug/L	4	25	4	--	--	--	--	--	--	--
Cadmium	ug/L	5	9.2	5	--	--	--	--	--	--	--
Calcium	ug/L	--	--	--	--	--	--	--	--	--	--
Chromium	ug/L	100	--	100	--	--	--	--	--	--	--
Cobalt	ug/L	--	6	6	--	--	--	--	--	--	--
Copper	ug/L	1300	800	1300	--	--	--	--	--	--	--
Iron	ug/L	--	14000	14000	--	--	--	--	--	--	--
Iron (dissolved)	ug/L	--	14000	14000	--	--	--	--	--	--	--
Lead	ug/L	15	15	15	--	--	--	--	--	--	--
Magnesium	ug/L	--	--	--	--	--	--	--	--	--	--
Manganese	ug/L	--	430	430	--	--	--	--	--	--	--
Manganese (dissolved)	ug/L	--	430	430	--	--	--	--	--	--	--
Mercury	ug/L	2	0.63	2	--	--	--	--	--	--	--
Nickel	ug/L	--	390	390	--	--	--	--	--	--	--
Potassium	ug/L	--	--	--	--	--	--	--	--	--	--
Selenium	ug/L	50	100	50	--	--	--	--	--	--	--
Silver	ug/L	--	94	94	--	--	--	--	--	--	--
Sodium	ug/L	--	--	--	--	--	--	--	--	--	--
Thallium	ug/L	2	0.2	2	--	--	--	--	--	--	--
Vanadium	ug/L	--	86	86	--	--	--	--	--	--	--
Zinc	ug/L	--	6000	6000	--	--	--	--	--	--	--
Gas											
Ethane	ug/L	--	--	--	--	--	--	--	--	--	--
Ethene	ug/L	--	--	--	--	--	--	--	--	--	--
Methane	ug/L	--	--	--	--	--	--	--	--	--	--
Wet											
Nitrate (as N)	ug/L	10000	32000	10000	--	--	--	--	--	--	--
Sulfate	ug/L	--	--	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	ug/L	--	--	--	--	--	--	--	--	--	--

Footnotes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		BH-7	BH-8	MW-1D_2016	MW-1D_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016
Sample ID:		GW-077150-110713-AWY-108	GW-077150-110713-AWY-109	GW-077150-110716-TBM-102	GW-077150-011718-DJB-010	GW-077150-110716-TBM-101	GW-077150-011718-DJB-009	GW-077150-011718-DJB-008	GW-077150-040518-MHT-003
Sample Date:		11/7/2013	11/7/2013	11/7/2016	1/17/2018	11/7/2016	1/17/2018 (Duplicate)	1/17/2018	4/5/2018
Parameters	**Units**								
Field Parameters									
VOCs									
1,1,1,2-Tetrachloroethane	ug/L	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
1,1,1-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
1,1,2,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	--	--	--	--	--	--
1,1,2-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
1,1-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
1,1-Dichloroethene	ug/L	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	2.8	1.0 U	--
1,2,4-Trichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
1,2-Dibromoethane (Ethylene dibromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
1,2-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
1,2-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
1,2-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
1,3-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
1,4-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	10 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--
2-Hexanone	ug/L	10 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	10 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--
Acetone	ug/L	20 U	20 U	30	5.0 U	5.0 U	5.0 U	5.0 U	--
Benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Bromodichloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Bromoform	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Bromomethane (Methyl bromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Carbon disulfide	ug/L	5.0 U	5.0 U	1.9	1.0 U	1.0 U	1.0 U	1.0 U	--
Carbon tetrachloride	ug/L	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Chlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Chloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Chloroform (Trichloromethane)	ug/L	1.0 U	1.0 U	1.2	1.0 U	2.1	2.5	2.5	--
Chloromethane (Methyl chloride)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
cis-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	2.3	5.4	5.6	--
cis-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Cyclohexane	ug/L	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Dibromochloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Dichlorodifluoromethane (CFC-12)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Ethylbenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Isopropyl benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Methyl acetate	ug/L	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Methyl cyclohexane	ug/L	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Methyl tert butyl ether (MTBE)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Methylene chloride	ug/L	5.0 U	5.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	--
Styrene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Tetrachloroethene	ug/L	**120**	**530**	1.0 U	R	**3100**	**4100**	**4200**	--
Toluene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
trans-1,2-Dichloroethene	ug/L	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
trans-1,3-Dichloropropene	ug/L	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Trichloroethene	ug/L	1.0 U	**6.2**	1.0 U	1.0 U	**82**	**110**	**110**	--
Trichlorofluoromethane (CFC-11)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Trifluorotrichloroethane (CFC-113)	ug/L	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Vinyl chloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--
Xylenes (total)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		BH-7	BH-8	MW-1D_2016	MW-1D_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016
Sample ID:		GW-077150-110713-AWY-108	GW-077150-110713-AWY-109	GW-077150-110716-TBM-102	GW-077150-011718-DJB-010	GW-077150-110716-TBM-101	GW-077150-011718-DJB-009	GW-077150-011718-DJB-008	GW-077150-040518-MHT-003
Sample Date:		11/7/2013	11/7/2013	11/7/2016	1/17/2018	11/7/2016	1/17/2018 (Duplicate)	1/17/2018	4/5/2018
Parameters	**Units**								
SVOCs									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	--	--	10 U	--	10 U	--	--	--
2,4,5-Trichlorophenol	ug/L	--	--	25 U	--	25 U	--	--	--
2,4,6-Trichlorophenol	ug/L	--	--	10 U	--	10 U	--	--	--
2,4-Dichlorophenol	ug/L	--	--	10 UJ	--	10 UJ	--	--	--
2,4-Dimethylphenol	ug/L	--	--	10 UJ	--	10 UJ	--	--	--
2,4-Dinitrophenol	ug/L	--	--	25 U	--	25 U	--	--	--
2,4-Dinitrotoluene	ug/L	--	--	10 U	--	10 U	--	--	--
2,6-Dinitrotoluene	ug/L	--	--	10 U	--	10 U	--	--	--
2-Chloronaphthalene	ug/L	--	--	10 U	--	10 U	--	--	--
2-Chlorophenol	ug/L	--	--	10 U	--	10 U	--	--	--
2-Methylnaphthalene	ug/L	--	--	10 U	--	10 U	--	--	--
2-Methylphenol	ug/L	--	--	10 UJ	--	10 UJ	--	--	--
2-Nitroaniline	ug/L	--	--	25 U	--	25 U	--	--	--
2-Nitrophenol	ug/L	--	--	10 U	--	10 U	--	--	--
3,3'-Dichlorobenzidine	ug/L	--	--	10 U	--	10 U	--	--	--
3-Nitroaniline	ug/L	--	--	25 U	--	25 U	--	--	--
4,6-Dinitro-2-methylphenol	ug/L	--	--	25 U	--	25 U	--	--	--
4-Bromophenyl phenyl ether	ug/L	--	--	10 U	--	10 U	--	--	--
4-Chloro-3-methylphenol	ug/L	--	--	10 U	--	10 U	--	--	--
4-Chloroaniline	ug/L	--	--	10 U	--	10 U	--	--	--
4-Chlorophenyl phenyl ether	ug/L	--	--	10 U	--	10 U	--	--	--
4-Methylphenol	ug/L	--	--	10 U	--	10 U	--	--	--
4-Nitroaniline	ug/L	--	--	25 U	--	25 U	--	--	--
4-Nitrophenol	ug/L	--	--	25 U	--	25 U	--	--	--
Acenaphthene	ug/L	--	--	10 U	--	10 U	--	--	--
Acenaphthylene	ug/L	--	--	10 U	--	10 U	--	--	--
Acetophenone	ug/L	--	--	10 U	--	10 U	--	--	--
Anthracene	ug/L	--	--	10 U	--	10 U	--	--	--
Atrazine	ug/L	--	--	10 U	--	10 U	--	--	--
Benzaldehyde	ug/L	--	--	10 U	--	10 U	--	--	--
Benzo(a)anthracene	ug/L	--	--	10 U	--	10 U	--	--	--
Benzo(a)pyrene	ug/L	--	--	10 U	--	10 U	--	--	--
Benzo(b)fluoranthene	ug/L	--	--	10 U	--	10 U	--	--	--
Benzo(g,h,i)perylene	ug/L	--	--	10 U	--	10 U	--	--	--
Benzo(k)fluoranthene	ug/L	--	--	10 U	--	10 U	--	--	--
Biphenyl (1,1-Biphenyl)	ug/L	--	--	10 U	--	10 U	--	--	--
bis(2-Chloroethoxy)methane	ug/L	--	--	10 U	--	10 U	--	--	--
bis(2-Chloroethyl)ether	ug/L	--	--	10 U	--	10 U	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	--	--	10 U	--	10 U	--	--	--
Butyl benzylphthalate (BBP)	ug/L	--	--	10 U	--	10 U	--	--	--
Caprolactam	ug/L	--	--	10 U	--	10 U	--	--	--
Carbazole	ug/L	--	--	10 U	--	10 U	--	--	--
Chrysene	ug/L	--	--	10 U	--	10 U	--	--	--
Dibenz(a,h)anthracene	ug/L	--	--	10 U	--	10 U	--	--	--
Dibenzofuran	ug/L	--	--	10 U	--	10 U	--	--	--
Diethyl phthalate	ug/L	--	--	10 U	--	10 U	--	--	--
Dimethyl phthalate	ug/L	--	--	10 U	--	10 U	--	--	--
Di-n-butylphthalate (DBP)	ug/L	--	--	10 U	--	10 U	--	--	--
Di-n-octyl phthalate (DnOP)	ug/L	--	--	10 U	--	10 U	--	--	--
Fluoranthene	ug/L	--	--	10 U	--	10 U	--	--	--
Fluorene	ug/L	--	--	10 U	--	10 U	--	--	--
Hexachlorobenzene	ug/L	--	--	10 U	--	10 U	--	--	--
Hexachlorobutadiene	ug/L	--	--	10 UJ	--	10 UJ	--	--	--
Hexachlorocyclopentadiene	ug/L	--	--	10 U	--	10 U	--	--	--
Hexachloroethane	ug/L	--	--	10 U	--	10 U	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L	--	--	10 U	--	10 U	--	--	--
Isophorone	ug/L	--	--	10 U	--	10 U	--	--	--
Naphthalene	ug/L	--	--	10 U	--	10 U	--	--	--
Nitrobenzene	ug/L	--	--	10 U	--	10 U	--	--	--
N-Nitrosodi-n-propylamine	ug/L	--	--	10 U	--	10 U	--	--	--
N-Nitrosodiphenylamine	ug/L	--	--	10 U	--	10 U	--	--	--
Pentachlorophenol	ug/L	--	--	25 U	--	25 U	--	--	--
Phenanthrene	ug/L	--	--	10 U	--	10 U	--	--	--
Phenol	ug/L	--	--	10 U	--	10 U	--	--	--
Pyrene	ug/L	--	--	10 U	--	10 U	--	--	--

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		BH-7	BH-8	MW-1D_2016	MW-1D_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016
Sample ID:		GW-077150-110713-AWY-108	GW-077150-110713-AWY-109	GW-077150-110716-TBM-102	GW-077150-011718-DJB-010	GW-077150-110716-TBM-101	GW-077150-011718-DJB-009	GW-077150-011718-DJB-008	GW-077150-040518-MHT-003
Sample Date:		11/7/2013	11/7/2013	11/7/2016	1/17/2018	11/7/2016	1/17/2018 (Duplicate)	1/17/2018	4/5/2018
Parameters	**Units**								
Metals									
Aluminum	ug/L	--	--	4090	--	211	--	--	--
Antimony	ug/L	--	--	**56.9**	--	20.0 U	--	--	--
Arsenic	ug/L	--	--	10.0 U	--	10.0 U	--	--	--
Barium	ug/L	--	--	20.0 U	--	250	--	--	--
Beryllium	ug/L	--	--	5.00 U	--	5.00 U	--	--	--
Cadmium	ug/L	--	--	5.00 U	--	5.00 U	--	--	--
Calcium	ug/L	--	--	62000	--	558	--	--	--
Chromium	ug/L	--	--	48.9	--	10.0 U	--	--	--
Cobalt	ug/L	--	--	20.0 U	--	20.0 U	--	--	--
Copper	ug/L	--	--	10.0 U	--	10.0 U	--	--	--
Iron	ug/L	--	--	100 U	--	100 U	--	--	100 U
Iron (dissolved)	ug/L	--	--	--	--	--	--	--	100 U
Lead	ug/L	--	--	5.00 U	--	5.00 U	--	--	--
Magnesium	ug/L	--	--	100 U	--	1060	--	--	--
Manganese	ug/L	--	--	15.0 U	--	**499**	--	--	**486**
Manganese (dissolved)	ug/L	--	--	--	--	--	--	--	**476**
Mercury	ug/L	--	--	0.200 U	--	0.200 U	--	--	--
Nickel	ug/L	--	--	54.7	--	20.0 U	--	--	--
Potassium	ug/L	--	--	11300	--	5130	--	--	--
Selenium	ug/L	--	--	**62.1**	--	10.0 U	--	--	--
Silver	ug/L	--	--	10.0 U	--	10.0 U	--	--	--
Sodium	ug/L	--	--	19700 J	--	8660 J	--	--	--
Thallium	ug/L	--	--	10.0 U	--	10.0 U	--	--	--
Vanadium	ug/L	--	--	11.7	--	10.0 U	--	--	--
Zinc	ug/L	--	--	20.0 U	--	20.0 U	--	--	--
Gas									
Ethane	ug/L	--	--	--	--	--	--	--	9.0 U
Ethene	ug/L	--	--	--	--	--	--	--	7.0 U
Methane	ug/L	--	--	--	--	--	--	--	4.0 U
Wet									
Nitrate (as N)	ug/L	--	--	--	--	--	--	--	9650
Sulfate	ug/L	--	--	--	--	--	--	--	2500
Total organic carbon (TOC)	ug/L	--	--	--	--	--	--	--	2400

Footnotes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-2_2016	MW-2_2016	MW-3_2016	MW-3_2016	MW-4_2016
Sample ID:		GW-077150-042519-SAG-005	GW-077150-072619-SAG-004	GW-077150-072619-SAG-003	GW-077150-110816-TBM-104	GW-077150-011618-DJB-002	GW-077150-110716-TBM-103	GW-077150-011618-DJB-001	GW-077150-110816-TBM-107
Sample Date:		4/25/2019	7/26/2019 (Duplicate)	7/26/2019	11/8/2016	1/16/2018	11/7/2016	1/16/2018	11/8/2016
Parameters	**Units**								
Field Parameters									
VOCs									
1,1,1,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	ug/L	1.0 U	1.1	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Hexanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	ug/L	41	27	23	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	1.0 U	2.4	2.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	ug/L	6.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	ug/L	2.3	1.0 U	2.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	ug/L	1.0	1.5	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	ug/L	3.8	1.5	1.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	ug/L	1.0 U	1.0 U	R	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	480	500	520	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L	1.8	1.3	1.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	ug/L	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-2_2016	MW-2_2016	MW-3_2016	MW-3_2016	MW-4_2016
Sample ID:		GW-077150-042519-SAG-005	GW-077150-072619-SAG-004	GW-077150-072619-SAG-003	GW-077150-110816-TBM-104	GW-077150-011618-DJB-002	GW-077150-110716-TBM-103	GW-077150-011618-DJB-001	GW-077150-110816-TBM-107
Sample Date:		4/25/2019	7/26/2019 (Duplicate)	7/26/2019	11/8/2016	1/16/2018	11/7/2016	1/16/2018	11/8/2016
Parameters	**Units**								
SVOCs									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	--	--	--	10 U	--	10 U	--	10 U
2,4,5-Trichlorophenol	ug/L	--	--	--	25 U	--	25 U	--	25 U
2,4,6-Trichlorophenol	ug/L	--	--	--	10 U	--	10 U	--	10 U
2,4-Dichlorophenol	ug/L	--	--	--	10 UJ	--	10 UJ	--	10 UJ
2,4-Dimethylphenol	ug/L	--	--	--	10 UJ	--	10 UJ	--	10 UJ
2,4-Dinitrophenol	ug/L	--	--	--	25 U	--	25 U	--	25 U
2,4-Dinitrotoluene	ug/L	--	--	--	10 U	--	10 U	--	10 U
2,6-Dinitrotoluene	ug/L	--	--	--	10 U	--	10 U	--	10 U
2-Chloronaphthalene	ug/L	--	--	--	10 U	--	10 U	--	10 U
2-Chlorophenol	ug/L	--	--	--	10 U	--	10 U	--	10 U
2-Methylnaphthalene	ug/L	--	--	--	10 U	--	10 U	--	10 U
2-Methylphenol	ug/L	--	--	--	10 UJ	--	10 UJ	--	10 UJ
2-Nitroaniline	ug/L	--	--	--	25 U	--	25 U	--	25 U
2-Nitrophenol	ug/L	--	--	--	10 U	--	10 U	--	10 U
3,3'-Dichlorobenzidine	ug/L	--	--	--	R	--	10 U	--	10 U
3-Nitroaniline	ug/L	--	--	--	25 U	--	25 U	--	25 U
4,6-Dinitro-2-methylphenol	ug/L	--	--	--	25 U	--	25 U	--	25 U
4-Bromophenyl phenyl ether	ug/L	--	--	--	10 U	--	10 U	--	10 U
4-Chloro-3-methylphenol	ug/L	--	--	--	10 U	--	10 U	--	10 U
4-Chloroaniline	ug/L	--	--	--	10 U	--	10 U	--	10 U
4-Chlorophenyl phenyl ether	ug/L	--	--	--	10 U	--	10 U	--	10 U
4-Methylphenol	ug/L	--	--	--	10 U	--	10 U	--	10 U
4-Nitroaniline	ug/L	--	--	--	25 U	--	25 U	--	25 U
4-Nitrophenol	ug/L	--	--	--	25 U	--	25 U	--	25 U
Acenaphthene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Acenaphthylene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Acetophenone	ug/L	--	--	--	10 U	--	10 U	--	10 U
Anthracene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Atrazine	ug/L	--	--	--	10 U	--	10 U	--	10 U
Benzaldehyde	ug/L	--	--	--	10 U	--	10 U	--	10 U
Benzo(a)anthracene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Benzo(a)pyrene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Benzo(b)fluoranthene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Benzo(g,h,i)perylene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Benzo(k)fluoranthene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Biphenyl (1,1-Biphenyl)	ug/L	--	--	--	10 U	--	10 U	--	10 U
bis(2-Chloroethoxy)methane	ug/L	--	--	--	10 U	--	10 U	--	10 U
bis(2-Chloroethyl)ether	ug/L	--	--	--	10 U	--	10 U	--	10 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	--	--	--	10 U	--	10 U	--	10 U
Butyl benzylphthalate (BBP)	ug/L	--	--	--	10 U	--	10 U	--	10 U
Caprolactam	ug/L	--	--	--	10 U	--	10 U	--	10 U
Carbazole	ug/L	--	--	--	10 U	--	10 U	--	10 U
Chrysene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Dibenz(a,h)anthracene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Dibenzofuran	ug/L	--	--	--	10 U	--	10 U	--	10 U
Diethyl phthalate	ug/L	--	--	--	10 U	--	10 U	--	10 U
Dimethyl phthalate	ug/L	--	--	--	10 U	--	10 U	--	10 U
Di-n-butylphthalate (DBP)	ug/L	--	--	--	10 U	--	10 U	--	10 U
Di-n-octyl phthalate (DnOP)	ug/L	--	--	--	10 U	--	10 U	--	10 U
Fluoranthene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Fluorene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Hexachlorobenzene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Hexachlorobutadiene	ug/L	--	--	--	10 UJ	--	10 UJ	--	10 UJ
Hexachlorocyclopentadiene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Hexachloroethane	ug/L	--	--	--	10 U	--	10 U	--	10 U
Indeno(1,2,3-cd)pyrene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Isophorone	ug/L	--	--	--	10 U	--	10 U	--	10 U
Naphthalene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Nitrobenzene	ug/L	--	--	--	10 U	--	10 U	--	10 U
N-Nitrosodi-n-propylamine	ug/L	--	--	--	10 U	--	10 U	--	10 U
N-Nitrosodiphenylamine	ug/L	--	--	--	10 U	--	10 U	--	10 U
Pentachlorophenol	ug/L	--	--	--	25 U	--	25 U	--	25 U
Phenanthrene	ug/L	--	--	--	10 U	--	10 U	--	10 U
Phenol	ug/L	--	--	--	10 U	--	10 U	--	10 U
Pyrene	ug/L	--	--	--	10 U	--	10 U	--	10 U

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-2_2016	MW-2_2016	MW-3_2016	MW-3_2016	MW-4_2016
Sample ID:		GW-077150-042519-SAG-005	GW-077150-072619-SAG-004	GW-077150-072619-SAG-003	GW-077150-110816-TBM-104	GW-077150-011618-DJB-002	GW-077150-110716-TBM-103	GW-077150-011618-DJB-001	GW-077150-110816-TBM-107
Sample Date:		4/25/2019	7/26/2019 (Duplicate)	7/26/2019	11/8/2016	1/16/2018	11/7/2016	1/16/2018	11/8/2016
Parameters	**Units**								
Metals									
Aluminum	ug/L	--	--	--	202	--	200 U	--	754
Antimony	ug/L	--	--	--	20.0 U	--	20.0 U	--	20.0 U
Arsenic	ug/L	--	--	--	10.0 U	--	10.0 U	--	10.0 U
Barium	ug/L	--	--	--	63.5	--	117	--	30.2
Beryllium	ug/L	--	--	--	5.00 U	--	5.00 U	--	5.00 U
Cadmium	ug/L	--	--	--	5.00 U	--	5.00 U	--	5.00 U
Calcium	ug/L	--	--	--	1540	--	1940	--	4640
Chromium	ug/L	--	--	--	10.0 U	--	10.0 U	--	10.0 U
Cobalt	ug/L	--	--	--	20.0 U	--	20.0 U	--	20.0 U
Copper	ug/L	--	--	--	10.0 U	--	10.0 U	--	10.0 U
Iron	ug/L	--	--	--	152	--	433	--	100 U
Iron (dissolved)	ug/L	--	--	--	--	--	--	--	--
Lead	ug/L	--	--	--	5.00 U	--	5.00 U	--	5.00 U
Magnesium	ug/L	--	--	--	288	--	356	--	389
Manganese	ug/L	--	--	--	357	--	**1600**	--	79.9
Manganese (dissolved)	ug/L	--	--	--	--	--	--	--	--
Mercury	ug/L	--	--	--	0.200 U	--	0.200 U	--	0.200 U
Nickel	ug/L	--	--	--	20.0 U	--	20.0 U	--	20.0 U
Potassium	ug/L	--	--	--	1970	--	1820	--	25400
Selenium	ug/L	--	--	--	10.0 U	--	10.0 U	--	10.0 U
Silver	ug/L	--	--	--	10.0 U	--	10.0 U	--	10.0 U
Sodium	ug/L	--	--	--	9790 J	--	2250 J	--	9160 J
Thallium	ug/L	--	--	--	10.0 U	--	10.0 U	--	10.0 U
Vanadium	ug/L	--	--	--	10.0 U	--	10.0 U	--	10.0 U
Zinc	ug/L	--	--	--	20.0 U	--	20.0 U	--	20.0 U
Gas									
Ethane	ug/L	--	--	--	--	--	--	--	--
Ethene	ug/L	--	--	--	--	--	--	--	--
Methane	ug/L	--	--	--	--	--	--	--	--
Wet									
Nitrate (as N)	ug/L	--	--	--	--	--	--	--	--
Sulfate	ug/L	--	--	--	--	--	--	--	--
Total organic carbon (TOC)	ug/L	--	--	--	--	--	--	--	--

Footnotes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-4_2016	MW-5_2016	MW-5_2016	MW-5_2016	MW-5_2016	MW-5_2016	MW-6_2016	MW-6_2016
Sample ID:		GW-077150-011618-DJB-004	GW-077150-110816-TBM-108	GW-077150-011618-DJB-005	GW-077150-040518-MHT-002	GW-077150-042519-SAG-006	GW-077150-072619-SAG-006	GW-077150-110816-TBM-106	GW-077150-110816-TBM-105
Sample Date:		1/16/2018	11/8/2016	1/16/2018	4/5/2018	4/25/2019	7/26/2019	11/8/2016 (Duplicate)	11/8/2016
Parameters	**Units**								
Field Parameters									
VOCs									
1,1,1,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	**9.2**	**9.1**
1,1-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	**33**	**33**
1,2,4-Trichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U
2-Hexanone	ug/L	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	ug/L	5.0 U	5.0 U	5.0 U	--	46	19	5.0 U	5.0 U
Benzene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	0.48 J	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	2.0 U	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	1.0 U	**53**	**49**	--	**14**	**21**	1.0 U	1.0 U
Toluene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-4_2016	MW-5_2016	MW-5_2016	MW-5_2016	MW-5_2016	MW-5_2016	MW-6_2016	MW-6_2016
Sample ID:		GW-077150-011618-DJB-004	GW-077150-110816-TBM-108	GW-077150-011618-DJB-005	GW-077150-040518-MHT-002	GW-077150-042519-SAG-006	GW-077150-072619-SAG-006	GW-077150-110816-TBM-106	GW-077150-110816-TBM-105
Sample Date:		1/16/2018	11/8/2016	1/16/2018	4/5/2018	4/25/2019	7/26/2019	11/8/2016 (Duplicate)	11/8/2016
Parameters	**Units**								
SVOCs									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	--	10 U	--	--	--	--	10 U	10 U
2,4,5-Trichlorophenol	ug/L	--	25 U	--	--	--	--	25 U	25 U
2,4,6-Trichlorophenol	ug/L	--	10 U	--	--	--	--	10 U	10 U
2,4-Dichlorophenol	ug/L	--	10 UJ	--	--	--	--	10 UJ	10 UJ
2,4-Dimethylphenol	ug/L	--	10 UJ	--	--	--	--	10 UJ	10 UJ
2,4-Dinitrophenol	ug/L	--	25 U	--	--	--	--	25 U	25 U
2,4-Dinitrotoluene	ug/L	--	10 U	--	--	--	--	10 U	10 U
2,6-Dinitrotoluene	ug/L	--	10 U	--	--	--	--	10 U	10 U
2-Chloronaphthalene	ug/L	--	10 U	--	--	--	--	10 U	10 U
2-Chlorophenol	ug/L	--	10 U	--	--	--	--	10 U	10 U
2-Methylnaphthalene	ug/L	--	10 U	--	--	--	--	10 U	10 U
2-Methylphenol	ug/L	--	10 UJ	--	--	--	--	10 UJ	10 UJ
2-Nitroaniline	ug/L	--	25 U	--	--	--	--	25 U	25 U
2-Nitrophenol	ug/L	--	10 U	--	--	--	--	10 U	10 U
3,3'-Dichlorobenzidine	ug/L	--	10 U	--	--	--	--	10 U	10 U
3-Nitroaniline	ug/L	--	25 U	--	--	--	--	25 U	25 U
4,6-Dinitro-2-methylphenol	ug/L	--	25 U	--	--	--	--	25 U	25 U
4-Bromophenyl phenyl ether	ug/L	--	10 U	--	--	--	--	10 U	10 U
4-Chloro-3-methylphenol	ug/L	--	10 U	--	--	--	--	10 U	10 U
4-Chloroaniline	ug/L	--	10 U	--	--	--	--	10 U	10 U
4-Chlorophenyl phenyl ether	ug/L	--	10 U	--	--	--	--	10 U	10 U
4-Methylphenol	ug/L	--	10 U	--	--	--	--	10 U	10 U
4-Nitroaniline	ug/L	--	25 U	--	--	--	--	25 U	25 U
4-Nitrophenol	ug/L	--	25 U	--	--	--	--	25 U	25 U
Acenaphthene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Acenaphthylene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Acetophenone	ug/L	--	10 U	--	--	--	--	10 U	10 U
Anthracene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Atrazine	ug/L	--	10 U	--	--	--	--	10 U	10 U
Benzaldehyde	ug/L	--	10 U	--	--	--	--	10 U	10 U
Benzo(a)anthracene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Benzo(a)pyrene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Benzo(b)fluoranthene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Benzo(g,h,i)perylene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Benzo(k)fluoranthene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Biphenyl (1,1-Biphenyl)	ug/L	--	10 U	--	--	--	--	10 U	10 U
bis(2-Chloroethoxy)methane	ug/L	--	10 U	--	--	--	--	10 U	10 U
bis(2-Chloroethyl)ether	ug/L	--	10 U	--	--	--	--	10 U	10 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	--	10 U	--	--	--	--	10 U	10 U
Butyl benzylphthalate (BBP)	ug/L	--	10 U	--	--	--	--	10 U	10 U
Caprolactam	ug/L	--	10 U	--	--	--	--	10 U	10 U
Carbazole	ug/L	--	10 U	--	--	--	--	10 U	10 U
Chrysene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Dibenz(a,h)anthracene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Dibenzofuran	ug/L	--	10 U	--	--	--	--	10 U	10 U
Diethyl phthalate	ug/L	--	10 U	--	--	--	--	10 U	10 U
Dimethyl phthalate	ug/L	--	10 U	--	--	--	--	10 U	10 U
Di-n-butylphthalate (DBP)	ug/L	--	10 U	--	--	--	--	10 U	10 U
Di-n-octyl phthalate (DnOP)	ug/L	--	10 U	--	--	--	--	10 U	10 U
Fluoranthene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Fluorene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Hexachlorobenzene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Hexachlorobutadiene	ug/L	--	10 UJ	--	--	--	--	10 UJ	10 UJ
Hexachlorocyclopentadiene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Hexachloroethane	ug/L	--	10 U	--	--	--	--	10 U	10 U
Indeno(1,2,3-cd)pyrene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Isophorone	ug/L	--	10 U	--	--	--	--	10 U	10 U
Naphthalene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Nitrobenzene	ug/L	--	10 U	--	--	--	--	10 U	10 U
N-Nitrosodi-n-propylamine	ug/L	--	10 U	--	--	--	--	10 U	10 U
N-Nitrosodiphenylamine	ug/L	--	10 U	--	--	--	--	10 U	10 U
Pentachlorophenol	ug/L	--	25 U	--	--	--	--	25 U	25 U
Phenanthrene	ug/L	--	10 U	--	--	--	--	10 U	10 U
Phenol	ug/L	--	10 U	--	--	--	--	10 U	10 U
Pyrene	ug/L	--	10 U	--	--	--	--	10 U	10 U

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-4_2016	MW-5_2016	MW-5_2016	MW-5_2016	MW-5_2016	MW-5_2016	MW-6_2016	MW-6_2016
Sample ID:		GW-077150-011618-DJB-004	GW-077150-110816-TBM-108	GW-077150-011618-DJB-005	GW-077150-040518-MHT-002	GW-077150-042519-SAG-006	GW-077150-072619-SAG-006	GW-077150-110816-TBM-106	GW-077150-110816-TBM-105
Sample Date:		1/16/2018	11/8/2016	1/16/2018	4/5/2018	4/25/2019	7/26/2019	11/8/2016 (Duplicate)	11/8/2016
Parameters	**Units**								
Metals									
Aluminum	ug/L	--	273	--	--	--	--	365	374
Antimony	ug/L	--	20.0 U	--	--	--	--	20.0 U	20.0 U
Arsenic	ug/L	--	10.0 U	--	--	--	--	10.0 U	10.0 U
Barium	ug/L	--	63.4	--	--	--	--	136	137
Beryllium	ug/L	--	5.00 U	--	--	--	--	5.00 U	5.00 U
Cadmium	ug/L	--	5.00 U	--	--	--	--	5.00 U	5.00 U
Calcium	ug/L	--	631	--	--	--	--	766	761
Chromium	ug/L	--	10.0 U	--	--	--	--	10.0 U	10.0 U
Cobalt	ug/L	--	20.0 U	--	--	--	--	20.0 U	20.0 U
Copper	ug/L	--	10.0 U	--	--	--	--	10.0 U	10.0 U
Iron	ug/L	--	100 U	--	100 U	--	--	100 U	100 U
Iron (dissolved)	ug/L	--	--	--	100 U	--	--	--	--
Lead	ug/L	--	5.00 U	--	--	--	--	5.00 U	5.00 U
Magnesium	ug/L	--	620	--	--	--	--	1790	1810
Manganese	ug/L	--	145	--	66.9	--	--	241	240
Manganese (dissolved)	ug/L	--	--	--	64.6	--	--	--	--
Mercury	ug/L	--	0.200 U	--	--	--	--	0.200 U	0.200 U
Nickel	ug/L	--	20.0 U	--	--	--	--	20.0 U	20.0 U
Potassium	ug/L	--	2550	--	--	--	--	5620	5600
Selenium	ug/L	--	10.0 U	--	--	--	--	10.0 U	10.0 U
Silver	ug/L	--	10.0 U	--	--	--	--	10.0 U	10.0 U
Sodium	ug/L	--	1220 J	--	--	--	--	51600 J	52400 J
Thallium	ug/L	--	10.0 U	--	--	--	--	10.0 U	10.0 U
Vanadium	ug/L	--	10.0 U	--	--	--	--	10.0 U	10.0 U
Zinc	ug/L	--	20.0 U	--	--	--	--	20.0 U	20.0 U
Gas									
Ethane	ug/L	--	--	--	9.0 U	--	--	--	--
Ethene	ug/L	--	--	--	7.0 U	--	--	--	--
Methane	ug/L	--	--	--	4.0 U	--	--	--	--
Wet									
Nitrate (as N)	ug/L	--	--	--	811	--	--	--	--
Sulfate	ug/L	--	--	--	1870	--	--	--	--
Total organic carbon (TOC)	ug/L	--	--	--	1000 U	--	--	--	--

Footnotes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-6_2016	MW-6_2016	MW-6_2016	MW-6_2016	MW-7_2016	MW-8_2016	TW-10	TW-10
Sample ID:		GW-077150-011618-DJB-003	GW-077150-040518-MHT-001	GW-077150-042519-SAG-001	GW-077150-072619-SAG-001	GW-077150-011618-DJB-007	GW-077150-011618-DJB-006	GW-077150-011419-SAG-001	GW-077150-042519-SAG-004
Sample Date:		1/16/2018	4/5/2018	4/25/2019	7/26/2019	1/16/2018	1/16/2018	1/14/2019	4/25/2019 (Duplicate)
Parameters	**Units**								
Field Parameters									
VOCs									
1,1,1,2-Tetrachloroethane	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L	6.2	--	8.7	7.8	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	29	--	34	31	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Hexanone	ug/L	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	ug/L	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	8.6	5.0 U
Benzene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	ug/L	1.0 U	--	1.0 U	0.24 J	1.0 U	1.0 U	1.0 U	0.77 J
Chloromethane (Methyl chloride)	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5
cis-1,3-Dichloropropene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	4.8	910
Toluene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	36	1.8
trans-1,2-Dichloroethene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L	1.0 U	--	1.0	1.0	1.0 U	1.0 U	1.0 U	19
Trichlorofluoromethane (CFC-11)	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		MW-6_2016	MW-6_2016	MW-6_2016	MW-6_2016	MW-7_2016	MW-8_2016	TW-10	TW-10
Sample ID:		GW-077150-011618-DJB-003	GW-077150-040518-MHT-001	GW-077150-042519-SAG-001	GW-077150-072619-SAG-001	GW-077150-011618-DJB-007	GW-077150-011618-DJB-006	GW-077150-011419-SAG-001	GW-077150-042519-SAG-004
Sample Date:		1/16/2018	4/5/2018	4/25/2019	7/26/2019	1/16/2018	1/16/2018	1/14/2019	4/25/2019 (Duplicate)
Parameters	**Units**								
SVOCs									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	ug/L	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	ug/L	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	ug/L	--	--	--	--	--	--	--	--
2,4-Dimethylphenol	ug/L	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	ug/L	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	ug/L	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	ug/L	--	--	--	--	--	--	--	--
2-Chloronaphthalene	ug/L	--	--	--	--	--	--	--	--
2-Chlorophenol	ug/L	--	--	--	--	--	--	--	--
2-Methylnaphthalene	ug/L	--	--	--	--	--	--	--	--
2-Methylphenol	ug/L	--	--	--	--	--	--	--	--
2-Nitroaniline	ug/L	--	--	--	--	--	--	--	--
2-Nitrophenol	ug/L	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	ug/L	--	--	--	--	--	--	--	--
3-Nitroaniline	ug/L	--	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	ug/L	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	ug/L	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	ug/L	--	--	--	--	--	--	--	--
4-Chloroaniline	ug/L	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	ug/L	--	--	--	--	--	--	--	--
4-Methylphenol	ug/L	--	--	--	--	--	--	--	--
4-Nitroaniline	ug/L	--	--	--	--	--	--	--	--
4-Nitrophenol	ug/L	--	--	--	--	--	--	--	--
Acenaphthene	ug/L	--	--	--	--	--	--	--	--
Acenaphthylene	ug/L	--	--	--	--	--	--	--	--
Acetophenone	ug/L	--	--	--	--	--	--	--	--
Anthracene	ug/L	--	--	--	--	--	--	--	--
Atrazine	ug/L	--	--	--	--	--	--	--	--
Benzaldehyde	ug/L	--	--	--	--	--	--	--	--
Benzo(a)anthracene	ug/L	--	--	--	--	--	--	--	--
Benzo(a)pyrene	ug/L	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	ug/L	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	ug/L	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	ug/L	--	--	--	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	ug/L	--	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	ug/L	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	ug/L	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	--	--	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	ug/L	--	--	--	--	--	--	--	--
Caprolactam	ug/L	--	--	--	--	--	--	--	--
Carbazole	ug/L	--	--	--	--	--	--	--	--
Chrysene	ug/L	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L	--	--	--	--	--	--	--	--
Dibenzofuran	ug/L	--	--	--	--	--	--	--	--
Diethyl phthalate	ug/L	--	--	--	--	--	--	--	--
Dimethyl phthalate	ug/L	--	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	ug/L	--	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	ug/L	--	--	--	--	--	--	--	--
Fluoranthene	ug/L	--	--	--	--	--	--	--	--
Fluorene	ug/L	--	--	--	--	--	--	--	--
Hexachlorobenzene	ug/L	--	--	--	--	--	--	--	--
Hexachlorobutadiene	ug/L	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	ug/L	--	--	--	--	--	--	--	--
Hexachloroethane	ug/L	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L	--	--	--	--	--	--	--	--
Isophorone	ug/L	--	--	--	--	--	--	--	--
Naphthalene	ug/L	--	--	--	--	--	--	--	--
Nitrobenzene	ug/L	--	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	ug/L	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	ug/L	--	--	--	--	--	--	--	--
Pentachlorophenol	ug/L	--	--	--	--	--	--	--	--
Phenanthrene	ug/L	--	--	--	--	--	--	--	--
Phenol	ug/L	--	--	--	--	--	--	--	--
Pyrene	ug/L	--	--	--	--	--	--	--	--

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		**MW-6_2016**	**MW-6_2016**	**MW-6_2016**	**MW-6_2016**	**MW-7_2016**	**MW-8_2016**	**TW-10**	**TW-10**
Sample ID:		**GW-077150-011618-DJB-003**	**GW-077150-040518-MHT-001**	**GW-077150-042519-SAG-001**	**GW-077150-072619-SAG-001**	**GW-077150-011618-DJB-007**	**GW-077150-011618-DJB-006**	**GW-077150-011419-SAG-001**	**GW-077150-042519-SAG-004**
Sample Date:		**1/16/2018**	**4/5/2018**	**4/25/2019**	**7/26/2019**	**1/16/2018**	**1/16/2018**	**1/14/2019**	**4/25/2019 (Duplicate)**
Parameters	**Units**								
Metals									
Aluminum	ug/L	--	--	--	--	--	--	--	--
Antimony	ug/L	--	--	--	--	--	--	--	--
Arsenic	ug/L	--	--	--	--	--	--	--	--
Barium	ug/L	--	--	--	--	--	--	--	--
Beryllium	ug/L	--	--	--	--	--	--	--	--
Cadmium	ug/L	--	--	--	--	--	--	--	--
Calcium	ug/L	--	--	--	--	--	--	--	--
Chromium	ug/L	--	--	--	--	--	--	--	--
Cobalt	ug/L	--	--	--	--	--	--	--	--
Copper	ug/L	--	--	--	--	--	--	--	--
Iron	ug/L	--	100 U	--	--	--	--	--	--
Iron (dissolved)	ug/L	--	100 U	--	--	--	--	--	--
Lead	ug/L	--	--	--	--	--	--	--	--
Magnesium	ug/L	--	--	--	--	--	--	--	--
Manganese	ug/L	--	109	--	--	--	--	--	--
Manganese (dissolved)	ug/L	--	105	--	--	--	--	--	--
Mercury	ug/L	--	--	--	--	--	--	--	--
Nickel	ug/L	--	--	--	--	--	--	--	--
Potassium	ug/L	--	--	--	--	--	--	--	--
Selenium	ug/L	--	--	--	--	--	--	--	--
Silver	ug/L	--	--	--	--	--	--	--	--
Sodium	ug/L	--	--	--	--	--	--	--	--
Thallium	ug/L	--	--	--	--	--	--	--	--
Vanadium	ug/L	--	--	--	--	--	--	--	--
Zinc	ug/L	--	--	--	--	--	--	--	--
Gas									
Ethane	ug/L	--	9.0 U	--	--	--	--	--	--
Ethene	ug/L	--	7.0 U	--	--	--	--	--	--
Methane	ug/L	--	4.0 U	--	--	--	--	--	--
Wet									
Nitrate (as N)	ug/L	--	5740	--	--	--	--	--	--
Sulfate	ug/L	--	1190	--	--	--	--	--	--
Total organic carbon (TOC)	ug/L	--	2570	--	--	--	--	--	--

Footnotes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		TW-10	TW-10	TW-11	TW-11	TW-11
Sample ID:		GW-077150-042519-SAG-003	GW-077150-072619-SAG-005	GW-077150-011419-SAG-002	GW-077150-042519-SAG-002	GW-077150-072619-SAG-002
Sample Date:		4/25/2019	7/26/2019	1/14/2019	4/25/2019	7/26/2019
Parameters	**Units**					
Field Parameters						
VOCs						
1,1,1,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	1.0 U	2.7	1.0 U
1,1,1-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	--	--	--	--	--
1,1,2-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Hexanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	ug/L	5.1	12	5.0 U	4.0 J	5.0 U
Benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	ug/L	0.64 J	0.76 J	1.0 U	0.83 J	1.0 U
Chloromethane (Methyl chloride)	ug/L	1.0 U	0.91 J	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	2.5	2.0	1.0 U	2.8	0.44 J
cis-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	910	1300	4.7	960	310
Toluene	ug/L	1.8	4.0	13	33	32
trans-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L	19	19	1.0 U	24	5.8
Trichlorofluoromethane (CFC-11)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	1.0 U	1.0 U	1.3	1.0 U	1.0 U

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		TW-10	TW-10	TW-11	TW-11	TW-11
Sample ID:		GW-077150-042519-SAG-003	GW-077150-072619-SAG-005	GW-077150-011419-SAG-002	GW-077150-042519-SAG-002	GW-077150-072619-SAG-002
Sample Date:		4/25/2019	7/26/2019	1/14/2019	4/25/2019	7/26/2019
Parameters	**Units**					
SVOCs						
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	--	--	--	--	--
2,4,5-Trichlorophenol	ug/L	--	--	--	--	--
2,4,6-Trichlorophenol	ug/L	--	--	--	--	--
2,4-Dichlorophenol	ug/L	--	--	--	--	--
2,4-Dimethylphenol	ug/L	--	--	--	--	--
2,4-Dinitrophenol	ug/L	--	--	--	--	--
2,4-Dinitrotoluene	ug/L	--	--	--	--	--
2,6-Dinitrotoluene	ug/L	--	--	--	--	--
2-Chloronaphthalene	ug/L	--	--	--	--	--
2-Chlorophenol	ug/L	--	--	--	--	--
2-Methylnaphthalene	ug/L	--	--	--	--	--
2-Methylphenol	ug/L	--	--	--	--	--
2-Nitroaniline	ug/L	--	--	--	--	--
2-Nitrophenol	ug/L	--	--	--	--	--
3,3'-Dichlorobenzidine	ug/L	--	--	--	--	--
3-Nitroaniline	ug/L	--	--	--	--	--
4,6-Dinitro-2-methylphenol	ug/L	--	--	--	--	--
4-Bromophenyl phenyl ether	ug/L	--	--	--	--	--
4-Chloro-3-methylphenol	ug/L	--	--	--	--	--
4-Chloroaniline	ug/L	--	--	--	--	--
4-Chlorophenyl phenyl ether	ug/L	--	--	--	--	--
4-Methylphenol	ug/L	--	--	--	--	--
4-Nitroaniline	ug/L	--	--	--	--	--
4-Nitrophenol	ug/L	--	--	--	--	--
Acenaphthene	ug/L	--	--	--	--	--
Acenaphthylene	ug/L	--	--	--	--	--
Acetophenone	ug/L	--	--	--	--	--
Anthracene	ug/L	--	--	--	--	--
Atrazine	ug/L	--	--	--	--	--
Benzaldehyde	ug/L	--	--	--	--	--
Benzo(a)anthracene	ug/L	--	--	--	--	--
Benzo(a)pyrene	ug/L	--	--	--	--	--
Benzo(b)fluoranthene	ug/L	--	--	--	--	--
Benzo(g,h,i)perylene	ug/L	--	--	--	--	--
Benzo(k)fluoranthene	ug/L	--	--	--	--	--
Biphenyl (1,1-Biphenyl)	ug/L	--	--	--	--	--
bis(2-Chloroethoxy)methane	ug/L	--	--	--	--	--
bis(2-Chloroethyl)ether	ug/L	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	--	--	--	--	--
Butyl benzylphthalate (BBP)	ug/L	--	--	--	--	--
Caprolactam	ug/L	--	--	--	--	--
Carbazole	ug/L	--	--	--	--	--
Chrysene	ug/L	--	--	--	--	--
Dibenz(a,h)anthracene	ug/L	--	--	--	--	--
Dibenzofuran	ug/L	--	--	--	--	--
Diethyl phthalate	ug/L	--	--	--	--	--
Dimethyl phthalate	ug/L	--	--	--	--	--
Di-n-butylphthalate (DBP)	ug/L	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	ug/L	--	--	--	--	--
Fluoranthene	ug/L	--	--	--	--	--
Fluorene	ug/L	--	--	--	--	--
Hexachlorobenzene	ug/L	--	--	--	--	--
Hexachlorobutadiene	ug/L	--	--	--	--	--
Hexachlorocyclopentadiene	ug/L	--	--	--	--	--
Hexachloroethane	ug/L	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/L	--	--	--	--	--
Isophorone	ug/L	--	--	--	--	--
Naphthalene	ug/L	--	--	--	--	--
Nitrobenzene	ug/L	--	--	--	--	--
N-Nitrosodi-n-propylamine	ug/L	--	--	--	--	--
N-Nitrosodiphenylamine	ug/L	--	--	--	--	--
Pentachlorophenol	ug/L	--	--	--	--	--
Phenanthrene	ug/L	--	--	--	--	--
Phenol	ug/L	--	--	--	--	--
Pyrene	ug/L	--	--	--	--	--

Table 1

Groundwater Analytical Results Summary
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:		**TW-10**	**TW-10**	**TW-11**	**TW-11**	**TW-11**
Sample ID:		**GW-077150-042519-SAG-003**	**GW-077150-072619-SAG-005**	**GW-077150-011419-SAG-002**	**GW-077150-042519-SAG-002**	**GW-077150-072619-SAG-002**
Sample Date:		**4/25/2019**	**7/26/2019**	**1/14/2019**	**4/25/2019**	**7/26/2019**
Parameters	**Units**					
Metals						
Aluminum	ug/L	--	--	--	--	--
Antimony	ug/L	--	--	--	--	--
Arsenic	ug/L	--	--	--	--	--
Barium	ug/L	--	--	--	--	--
Beryllium	ug/L	--	--	--	--	--
Cadmium	ug/L	--	--	--	--	--
Calcium	ug/L	--	--	--	--	--
Chromium	ug/L	--	--	--	--	--
Cobalt	ug/L	--	--	--	--	--
Copper	ug/L	--	--	--	--	--
Iron	ug/L	--	--	--	--	--
Iron (dissolved)	ug/L	--	--	--	--	--
Lead	ug/L	--	--	--	--	--
Magnesium	ug/L	--	--	--	--	--
Manganese	ug/L	--	--	--	--	--
Manganese (dissolved)	ug/L	--	--	--	--	--
Mercury	ug/L	--	--	--	--	--
Nickel	ug/L	--	--	--	--	--
Potassium	ug/L	--	--	--	--	--
Selenium	ug/L	--	--	--	--	--
Silver	ug/L	--	--	--	--	--
Sodium	ug/L	--	--	--	--	--
Thallium	ug/L	--	--	--	--	--
Vanadium	ug/L	--	--	--	--	--
Zinc	ug/L	--	--	--	--	--
Gas						
Ethane	ug/L	--	--	--	--	--
Ethene	ug/L	--	--	--	--	--
Methane	ug/L	--	--	--	--	--
Wet						
Nitrate (as N)	ug/L	--	--	--	--	--
Sulfate	ug/L	--	--	--	--	--
Total organic carbon (TOC)	ug/L	--	--	--	--	--

Footnotes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected

Table 2

Groundwater Elevations
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Wells	*Total Depth feet bTOC*	*Ground Surface Elevation* [1]	*TOC Elevation* [1]	*Depth to Groundwater (feet bTOC)*	*Groundwater Elevation (feet NAVD)*
				April 28, 2020	
MW-1S-16	29.15	845.06	844.81	17.61	827.20
MW-1D-16	58.25	844.42	844.05	16.41	827.64
MW-2-16	27.45	838.72	841.03	15.00	826.03
MW-3-16	27.55	838.71	841.03	16.39	824.64
MW-4-16	29.70	847.47	847.22	17.59	829.63
MW-5-16	30.28	847.03	849.13	20.01	829.12
MW-6-16	29.90	839.71	839.46	15.99	823.47
MW-7-18	28.64	NS	NS	16.04	NS
MW-8-18	27.25	NS	NS	14.78	NS
TW-10	24.70	841.00	841.00	14.01	826.99
TW-11	24.69	842.00	842.00	14.91	827.09

Notes:

1 Elevations are reported relative to SC State Plane NAD83 and NAVD88
NS Wells not surveyed
TOC elevations for TW- 10 and TW-11 are approximate, estimated based on ground surface elevations

Table 3

Groundwater Performance Results Summary
ISCO Pilot Injection Event Investigation
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:					MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016	MW-1S_2016
Sample ID:					GW-077150-011718-DJB-008	GW-077150-011718-DJB-009	GW-077150-042519-SAG-005	GW-077150-072619-SAG-003	GW-077150-072619-SAG-004	GW-077150-042820-SAG-004	GW-077150-042820-SAG-005
Sample Date:					1/17/2018	1/17/2018 (Duplicate)	4/25/2019	7/26/2019	7/26/2019 (Duplicate)	4/28/2020	4/28/2020 Duplicate
Parameters	**Units**	**EPA MCL May 2020**	**EPA Tapwater May 2020**	**Criteria Used May 2020**							
VOCs											
1,1,1,2-Tetrachloroethane	ug/L		0.57	0.57	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	ug/L	200	8000	200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	ug/L	5	0.28	5	1.0 U	1.0 U	1.0 U	1.2	1.1	1.0 U	1.0 U
1,1-Dichloroethane	ug/L		2.8	2.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	7	280	7	1.0 U	2.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L	70	1.2	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	0.2	0.00033	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	0.05	0.0075	0.05	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	600	300	600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	5	0.17	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	5	0.85	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L				1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	75	0.48	75	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L		5600	5600	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Hexanone	ug/L		38	38	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone)	ug/L		6300	6300	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	ug/L		14000	14000	5.0 U	5.0 U	41	23	27	11	9.8
Benzene	ug/L	5	0.46	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	80	0.13	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	80	3.3	80	1.0 U	1.0 U	1.0 U	2.1	2.4	1.5	1.2
Bromomethane (Methyl bromide)	ug/L		7.5	7.5	1.0 U	1.0 U	6.4	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	ug/L		810	810	1.0 U	1.0 U	2.3	2.0	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	ug/L	5	0.46	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L	100	78	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L		21000	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	ug/L	80	0.22	80	2.5	2.5	1.0	1.2	1.5	1.4	1.3
Chloromethane (Methyl chloride)	ug/L		190	190	1.0 U	1.0 U	3.8	1.5	1.5	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	70	36	70	5.6	5.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L				1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L		13000	13000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	ug/L	80	0.87	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L		200	200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	700	1.5	700	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	ug/L		450	450	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	ug/L		20000	20000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	ug/L				1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	ug/L		14	14	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	5	11	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	ug/L	100	1200	100	1.0 U	1.0 U	1.0 U	R	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	5	11	5	**4200**	**4100**	**480**	**520**	**500**	**180**	**150**
Toluene	ug/L	1000	1100	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	ug/L	100	360	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L				1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L	5	0.49	5	**110**	**110**	1.8	1.3	1.3	1.7	1.2
Trichlorofluoromethane (CFC-11)	ug/L		5200	5200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L		10000	10000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	ug/L	2	0.019	2	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	10000	190	10000	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U

Notes:

"--" No analysis performned during this event
U - Not detected at the associated reporting limit
J - Estimated concentration.
R - Rejected
Criteria Used - USEPA - Maximum Contaminant Levels (MCL) or Tapwater criteria (April 2019)
4200 - Bold, red value represents exceedance of the screening criteria used

Table 3

Groundwater Performance Results Summary
ISCO Pilot Injection Event Investigation
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:					**MW-5_2016**	**MW-5_2016**	**MW-5_2016**	**MW-5_2016**	**MW-6_2016**	**MW-6_2016**	**MW-6_2016**	**MW-6_2016**
Sample ID:					**GW-077150-011618-DJB-005**	**GW-077150-042519-SAG-006**	**GW-077150-072619-SAG-006**	**GW-077150-042820-SAG-006**	**GW-077150-011618-DJB-003**	**GW-077150-042519-SAG-001**	**GW-077150-072619-SAG-001**	**GW-077150-042820-SAG-001**
Sample Date:					**1/16/2018**	**4/25/2019**	**7/26/2019**	**4/28/2020**	**1/16/2018**	**4/25/2019**	**7/26/2019**	**4/28/2020**
Parameters	**Units**	**EPA MCL May 2020**	**EPA Tapwater May 2020**	**Criteria Used May 2020**								
VOCs												
1,1,1,2-Tetrachloroethane	ug/L		0.57	0.57	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	ug/L	200	8000	200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	ug/L	5	0.28	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L		2.8	2.8	1.0 U	1.0 U	1.0 U	1.0 U	**6.2**	**8.7**	**7.8**	**8.0**
1,1-Dichloroethene	ug/L	7	280	7	1.0 U	1.0 U	1.0 U	1.0 U	**29**	**34**	**31**	**36**
1,2,4-Trichlorobenzene	ug/L	70	1.2	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	0.2	0.00033	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	0.05	0.0075	0.05	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	600	300	600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	5	0.17	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	5	0.85	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L				1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	75	0.48	75	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L		5600	5600	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Hexanone	ug/L		38	38	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone)	ug/L		6300	6300	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	ug/L		14000	14000	5.0 U	46	19	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	ug/L	5	0.46	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	80	0.13	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	80	3.3	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	ug/L		7.5	7.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	ug/L		810	810	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	ug/L	5	0.46	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L	100	78	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L		21000	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	ug/L	80	0.22	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.24 J	1.0 U
Chloromethane (Methyl chloride)	ug/L		190	190	1.0 U	1.0 U	0.48 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	70	36	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L				1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L		13000	13000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	ug/L	80	0.87	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L		200	200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	700	1.5	700	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	ug/L		450	450	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	ug/L		20000	20000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	ug/L				1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	ug/L		14	14	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	5	11	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	ug/L	100	1200	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	5	11	5	**49**	**14**	**21**	4.6	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	ug/L	1000	1100	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	ug/L	100	360	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L				1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L	5	0.49	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0	1.0	1.9
Trichlorofluoromethane (CFC-11)	ug/L		5200	5200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L		10000	10000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	ug/L	2	0.019	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	10000	190	10000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Notes:

"--" No analysis performned during this event
U - Not detected at the associated reporting limit
J - Estimated concentration.
R - Rejected
Criteria Used - USEPA - Maximum Contaminant Levels (MCL) or Tapwater criteria (April 2019)
4200 - Bold, red value represents exceedance of the screening criteria used

Table 3

Groundwater Performance Results Summary
ISCO Pilot Injection Event Investigation
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample Location:					TW-10	TW-10	TW-10	TW-10	TW-10	TW-11	TW-11	TW-11	TW-11
Sample ID:					GW-077150-011419-SAG-001	GW-077150-042519-SAG-003	GW-077150-042519-SAG-004	GW-077150-072619-SAG-005	GW-077150-042820-SAG-003	GW-077150-011419-SAG-002	GW-077150-042519-SAG-002	GW-077150-072619-SAG-002	GW-077150-042820-SAG-002
Sample Date:					1/14/2019	4/25/2019	4/25/2019 (Duplicate)	7/26/2019	4/28/2020	1/14/2019	4/25/2019	7/26/2019	4/28/2020
Parameters	Units	EPA MCL May 2020	EPA Tapwater May 2020	Criteria Used May 2020									
VOCs													
1,1,1,2-Tetrachloroethane	ug/L		0.57	0.57	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.7**	1.0 U	**0.76 J**
1,1,1-Trichloroethane	ug/L	200	8000	200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	ug/L	5	0.28	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L		2.8	2.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	7	280	7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L	70	1.2	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	0.2	0.00033	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	0.05	0.0075	0.05	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	600	300	600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	5	0.17	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	5	0.85	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L				1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	75	0.48	75	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L		5600	5600	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Hexanone	ug/L		38	38	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone)	ug/L		6300	6300	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	ug/L		14000	14000	8.6	5.1	5.0 U	12	5.0 U	5.0 U	4.0 J	5.0 U	5.0 U
Benzene	ug/L	5	0.46	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	80	0.13	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	80	3.3	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	ug/L		7.5	7.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	ug/L		810	810	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	ug/L	5	0.46	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L	100	78	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L		21000	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	ug/L	80	0.22	80	1.0 U	0.64 J	0.77 J	0.76 J	0.56 J	1.0 U	0.83 J	1.0 U	1.4
Chloromethane (Methyl chloride)	ug/L		190	190	1.0 U	1.0 U	1.0 U	0.91 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	70	36	70	1.0 U	2.5	2.5	2.0	0.90 J	1.0 U	2.8	0.44 J	2.2
cis-1,3-Dichloropropene	ug/L				1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L		13000	13000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	ug/L	80	0.87	80	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	ug/L		200	200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	700	1.5	700	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	ug/L		450	450	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	ug/L		20000	20000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	ug/L				1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	ug/L		14	14	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	5	11	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	ug/L	100	1200	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	5	11	5	4.8	**910**	**910**	**1300**	**680**	4.7	**960**	**310**	**740**
Toluene	ug/L	1000	1100	1000	36	1.8	1.8	4.0	0.87 J	13	33	32	11
trans-1,2-Dichloroethene	ug/L	100	360	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L				1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L	5	0.49	5	1.0 U	**19**	**19**	**19**	**6.9**	1.0 U	**24**	**5.8**	**20**
Trichlorofluoromethane (CFC-11)	ug/L		5200	5200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	ug/L		10000	10000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	ug/L	2	0.019	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	10000	190	10000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.3	1.0 U	1.0 U	1.0 U

Notes:

"--" No analysis performned during this event
U - Not detected at the associated reporting limit
J - Estimated concentration.
R - Rejected
Criteria Used - USEPA - Maximum Contaminant Levels (MCL) or Tapwater criteria (April 2019)
4200 - Bold, red value represents exceedance of the screening criteria used

Table 4

Summary of Field Parameters And Residual Persulfate
Pilot Scale ISCO Injection Report
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Well ID	Date	pH	Conductivity (ms/cm)	DO (mg/L)	ORP (mv)	Residual Persulfate (g/L)	Notes
			Pre-injection Measurements				
MW-1S-16	1/17/2018	4.02	0.104	0.00	351	0.00	persulfate measured on Jan 4, 2019
MW-5-16	1/17/2018	4.78	0.04	2.03	320	0.00	persulfate measured on Jan 4, 2019
MW-6-16	1/17/2018	4.7	0.324	0.00	316	0.00	persulfate measured on Jan 4, 2019
TW-10	1/14/2019		Not measured, purged and collected grab sample			0.00	persulfate measured on Jan 4, 2019
TW-11	1/14/2019		Not measured, purged and collected grab sample			0.00	persulfate measured on Jan 4, 2019
			Post-injection Measurements				
MW-1S-16	4/25/2019	6.04	**6.54**	0.05	321	NM	
	7/26/2019	4.40	**7.17**	4.28	**659**	5.5	
	4/28/2020	**10.07**	**4.73**	**21.14**	330	NM	
MW-5-16	4/25/2019	**13.14**	**7.86**	**19.53**	25	NM	
	7/26/2019	**11.36**	**1.85**	**10.12**	78	**4.00**	
	4/28/2020	**10.35**	**3.17**	**10.36**	105	NM	
MW-6-16	4/25/2019	4.19	0.333	0.00	381	NM	
	7/26/2019	4.5	0.323	0.00	405	0.00	
	4/28/2020	4.59	0.344	1.82	295	NM	
TW-10	4/25/2019	4.76	0.067	0.09	293	NM	
	7/26/2019	4.62	0.293	0.2	600	**2.00**	
	4/28/2020	4.54	0.281	5.96	405	NM	
TW-11	4/25/2019	4.45	0.083	0.00	209	NM	
	7/26/2019	4.76	0.077	0.00	332	**2.5**	
	4/28/2020	4.93	0.085	2.24	227	NM	

Note:

NM - Not measured
Bold values show above normal measurements
ISCO (sodium persulfate) Injection event conducted January 15th through 25, 2019

Appendices

Appendix A
Pilot Injection Field Logs

Field Summary Report For
Former Bluewater Solutions
Located In Fountain Inn, SC

Field Contractor	Spur Environmental	**Client**	GHD
Field Lead	Eddie Escochea	**Field Lead**	Andy Grace
Contact Number	678-618-2726	**Contact Number**	678-280-2150
e-mail Address	e.escocheajr@gmail.com	**e-mail address**	
Start Date	January 14, 2019	**End Date**	January 25, 2019
Chemical	Sodium Persulfate Sodium Hydroxide	**Total Pounds** **Total Gallons**	46,284 10,400
Concentration	Sodium Persulfate @15% Sodium Hydroxide @ 25%		
Injection Points	13 injection points, 2 offset locations		
Injection Intervals	28ft and 20ft		

Summary Activity:

Between January 14, and January 25, 2019, Spur Environmental Services conducted injection activities at the former Lippes – Bluewater facility located at 100 Hunts Bridge Rd, Fountain Inn, SC. Over this 10-day period a total of 46,284 pounds of Sodium Persulfate 10,400 gallons of 25% Sodium Hydroxide and approximately 31,476 gallons of water was mixed into 500-gallon batches and injected into 14 locations. A Geoprobe® 7822DT and a 6620DT was used to advance 1.5" rods to 28 and 20 feet below ground surface.

Mixing ratio was provided by GHD see Fig. 1
The table below gives information about each location

BLUEWATER SITE
77150
ISCO INJECTION TOTALS AND BATCHING

Fig. 1

Injection Wells
Total Chemicals 1st event

Add	46,284 pounds	Sodium Persulfate	840.0 bags
To	31473 gallons	Water	
Yields	33834	Solution @ 15% concentration	
Activate with	10,400 25% NaOH	Gallons 25% NaOH	

Chemicals for each well
13 wells

Add	3560 Pounds	Sodium Persulfate	64.61 bags
To	2421 Gallons	Water	
Yields	2603 Gallons	Solution @ 25% concentration	
Activate with	800 Gallons	25% NaOH	
		Total Gallon/Well	**3,403 Gallons**

Batch Information
Per Well Basis
7 Batches / Well - 500 Gallon Tank

Add	509 Pounds	Sodium Persulfate	9.24 bags
To	346 Gallons	Water	
Yields	372 Gallons	Solution @ 25% concentration	
Activate with	114 Gallons	25% NaOH	
		Total/Tank	**486 Gallons**

Modified Batch Information
Per Well Basis

Na Persulfate	509 Pounds	Sodium Persulfate	9.25 bags
Water	350 Gallons	Water	
Solution	380 Gallons	Solution @ 25% concentration	
NaOH	115 Gallons	25% NaOH	
		Total/Tank	**500 Gallons**

Bluewater – Field Log
Fountain Inn, SC

Date	Injection Point	Injection Depth (ft)	Start Time	Stop Time	Injection Pressure (psi)	Volume Injected (gal)	Notes
1/23/2019	IP-1	28	1718	1828	35	500	
1/24/2019	IP-1	28	0755	0905	35	500	
1/24/2019	IP-1	28	0926	1031	35	500	
1/24/2019	IP-1	28	1051	1322	35	500	Comin up through MW-5, Slowed pump down and then offset 20’ east
1/24/2019	IP-1	20	1343	1547	35	500	
1/24/2019	IP-1	20	1616	1751	35	500	
1/24/2019	IP-1	20	1811	1947	35	500	Injections Complete
1/22/2019	IP-2	28	1822	1931	40	500	
1/23/2019	IP-2	28	0822	0932	40	500	
1/23/2019	IP-2	28	0958	1102	40	500	
1/23/2019	IP-2	28	1126	1228	40	500	
1/23/2019	IP-2	20	1300	1407	40	500	
1/23/2019	IP-2	28	1431	1535	40	500	
1/23/2019	IP-2	28	1554	1656	40	500	Injections Complete
1/15/2019	IP-3	28	1428	1323	30	500	
1/16/2019	IP-3	28	0833	0955	30	500	
1/16/2019	IP-3	28	1012	1130	30	500	
1/16/2019	IP-3	20	1155	1306	30	500	
1/16/2019	IP-3	20	1412	1513	30	500	
1/16/2019	IP-3	20	1516	1604	30	500	
1/16/2019	IP-3	20	1620	1718	30	500	Injections Complete

Bluewater – Field Log
Fountain Inn, SC

Date	Injection Point	Injection Depth (ft)	Start Time	Stop Time	Injection Pressure (psi)	Volume Injected (gal)	Notes
1/22/2019	IP-4	28	1817	1936	40	500	
1/23/2019	IP-4	28	0817	0930	40	500	
1/23/2019	IP-4	28	0952	1100	40	500	
1/23/2019	IP-4	28	1117	1220	40	500	
1/23/2019	IP-4	20	1300	1401	40	500	
1/23/2019	IP-4	20	1426	1525	40	500	
1/23/2019	IP-4	20	1600	1649	40	500	Injections Completed
1/18/2019	IP-5	28	0840	0930	35	500	
1/18/2019	IP-5	28	0950	1040	35	500	
1/18/2019	IP-5	28	1053	1140	35	500	
1/18/2019	IP-5	28	1153	1240	35	500	
1/18/2019	IP-5	20	1255	1337	35	500	
1/18/2019	IP-5	20	1354	1438	35	500	
1/18/2019	IP-5	20	1456	1540	35	500	Injections Completed
1/17/2019	IP-6	27	0846	0943	30	500	
1/17/2019	IP-6	27	1007	1055	30	500	
1/17/2019	IP-6	27	1108	1206	30	500	
1/17/2019	IP-6	27	1315	1404	30	500	
1/17/2019	IP-6	20	1433	1519	30	500	
1/17/2019	IP-6	20	1547	1642	30	500	
1/17/2019	IP-6	20	1655	1741	30	500	Injections Completed

Bluewater – Field Log
Fountain Inn, SC

Date	Injection Point	Depth Interval (ft)	Start Time	Stop Time	Injection Pressure (psi)	Volume Injected (gal)	Notes
1/18/2019	IP-7	28	0830	1015	30	500	
1/18/2019	IP-7	28	1024	1145	30	500	
1/18/2019	IP-7	28	1214	1332	30	500	
1/18/2019	IP-7	20	1350	1452	30	500	
1/18/2019	IP-7	20	1517	1620	30	500	
1/21/2019	IP-7	20	0900	1016	30	500	
1/21/2019	IP-7	20	1030	1041	30	75	Daylight occurring through seams in adjacent slab, will move to IP-4 and put remaining 425 gal into 28' interval
1/15/2019	IP-8	28	1117	1204	20/40	500	
1/15/2019	IP-8	28	1359	1457	30	500	
1/15/2019	IP-8	28	1516	1617	30	500	
1/16/2019	IP-8	28	0833	0935	30	500	
1/16/2019	IP-8	20	1000	1053	30	500	
1/16/2019	IP-8	20	1117	1209	30	500	
1/16/2019	IP-8	20	1222	1313	30	500	Injections Completed
1/21/2019	IP-9	28	0912	1000	35	500	
1/21/2019	IP-9	28	1015	1108	35	500	
1/21/2019	IP-9	28	1119	1220	35	500	
1/21/2019	IP-9	28	1228	1319	35	425	
1/21/2019	IP-9	20	1340	1443	35	500	
1/22/2019	IP-9	20	0900	1007	35	500	
1/22/2019	IP-9	20	1007	1105	35	450	
							Injections Completed

Bluewater – Field Log
Fountain Inn, SC

Date	Injection Point	Injection Depth (ft)	Start Time	Stop Time	Injection Pressure (psi)	Volume Injected (gal)	Notes
1/17/2019	IP-10	28	0853	1022	35	500	
1/17/2019	IP-10	28	1048	1155	35	500	
1/17/2019	IP-10	28	1238	1343	35	500	
1/17/2019	IP-10	20	1408	1506	35	500	
1/17/2019	IP-10	20	1524	1625	35	500	
1/17/2019	IP-10	20	1644	1745	35	500	
1/17/2019	IP-10	20	1757	1907	35	500	Injections Completed
1/23/2019	IP-11	28	1720	1830	35	500	
1/24/2019	IP-11	28	0758	0858	35	500	
1/24/2019	IP-11	28	0911	1012	35	500	
1/24/2019	IP-11	28	1024	1126	35	500	
1/24/2019	IP-11	20	1148	1250	35	500	
1/24/2019	IP-11	20	1310	1409	35	500	
1/24/2019	IP-11	20	1425	1521	35	500	Injections Completed
1/24/2019	IP-12	28	1552	1656	35	500	
1/24/2019	IP-12	28	1710	1811	35	500	
1/24/2019	IP-12	28	1823	1925	35	500	
1/25/2019	IP-12	20	0830	1011	35	500	
1/25/2019	IP-12	20	1032	1127	35	500	
1/25/2019	IP-12	20	1147	1235	35	500	Injections Completed

Bluewater – Field Log
Fountain Inn, SC

Date	Injection Point	Injection Depth (ft)	Start Time	Stop Time	Injection Pressure (psi)	Volume Injected (gal)	Notes
1/25/2019	IP-13	28	0902	1118	35	500	
1/25/2019	IP-13	28	1124	1255	35	500	
1/25/2019	IP-13	28	1315	1442	35	500	
1/25/2019	IP-13	20	1500	1624	35	500	
1/25/2019	IP-13	20	1624	1740	35	500	
1/25/2019	IP-13	20	1758	1859	35	500	Injections Completed
1/25/2019	IP-14	20	1307	1404	35	500	
1/25/2019	IP-14	20	1420	1515	35	500	Injections Completed

Appendix B
Temporary Wells Construction Detail

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: BLUEWATER THERMAL SOLUTIONS
PROJECT NUMBER: 077150
CLIENT: LIPPES, MATHIAS, WEXLER & FRIEDMAN LLP
LOCATION: FOUNTAIN INN, SC

HOLE DESIGNATION: TW-10
DATE COMPLETED: 14 January 2019
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: S.GRACE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH	TEMP MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)		
0	NO STRATIGRAPHIC INFORMATION AVAILABLE		CONCRETE					
2								
4			CEMENT GROUT					
6								
8								
10			BENTONITE					
12								
14			▽					
16								
18								
20			SAND, MEDIUM					
22								
24			1" PVC WELL CASING					
25.00	END OF BOREHOLE @ 25.0ft BGS	25.00						
26	GROUNDWATER SAMPLE ID: GW-077150-011419-SAG-001							
28								
30								
32								
34								

WELL DETAILS
Screened interval:
15.00 to 25.00ft BGS
Length: 10ft
Diameter: 1in
Slot Size: 0.010
Material: PVC
Seal:
9.00 to 13.00ft BGS
Material: BENTONITE
Sand Pack:
13.00 to 25.00ft BGS
Material: SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽

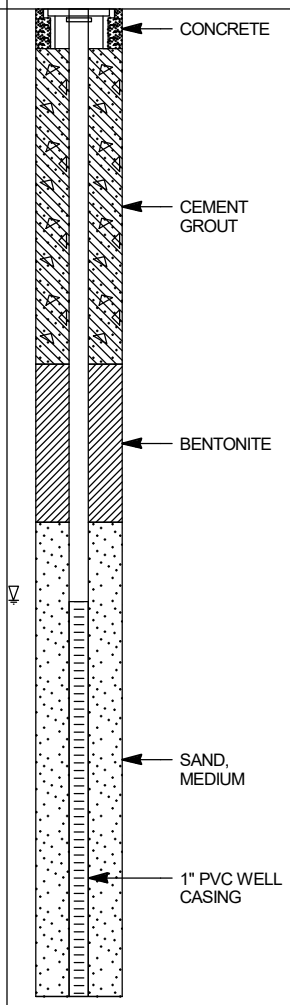
OVERBURDEN LOG 077150-WI.GPJ GHD_Corp 6/4/20

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: BLUEWATER THERMAL SOLUTIONS
PROJECT NUMBER: 077150
CLIENT: LIPPES, MATHIAS, WEXLER & FRIEDMAN LLP
LOCATION: FOUNTAIN INN, SC

HOLE DESIGNATION: TW-11
DATE COMPLETED: 14 January 2019
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: S.GRACE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH	TEMP MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)		
	NO STRATIGRAPHIC INFORMATION AVAILABLE							
	END OF BOREHOLE @ 25.0ft BGS GROUNDWATER SAMPLE ID: GW-077150-011419-SAG-002	25.00						



WELL DETAILS
Screened interval:
15.00 to 25.00ft BGS
Length: 10ft
Diameter: 1in
Slot Size: 0.010
Material: PVC
Seal:
9.00 to 13.00ft BGS
Material: BENTONITE
Sand Pack:
13.00 to 25.00ft BGS
Material: SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽

OVERBURDEN LOG 077150-WI.GPJ GHD_Corp 6/4/20

Appendix C
Groundwater Performance Sampling Field Forms (January, April and July 2019)

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Biewater

Ref. No.: _____

Date: 4/25/19

Personnel: S. Green

Monitoring Well Data:

Well ID: MW-6

Measured Well Depth (ft): 29.90

Screen Length (ft): 10'

Well Diameter, D (in): ~~3.40~~ 2"

Total Volume in Well (gal): _____

Purging/Sampling Data:

Purging/Sampling Device: peristaltic

Depth to Pump Intake (ft)[1]: 25

Initial Depth to Water (ft): 14.70

Total Volume Purged (gal): _____

pump start @ 854

Time	*Pumping Rate [2] (mL/min)*	*Depth to Water (ft)*	*Drawdown from Initial Water Level [2] (ft)*	*Temperature °C*	*Conductivity (mS/cm)*	*Turbidity NTU*	*DO (mg/L)*	*pH*	*ORP (mV)*
			Precision Required [4]:	*±3 %*	*±0.005 or 0.01 [3]*	*±10 %*	*±10 %*	*±0.1 Units*	*±10 mV*
905	60	14.75	0.05 ~~0.00~~	20.00	0.342	23.7	0.00	4.78	309
910	↓	14.78	0.08	18.99	0.343	24.3	0.00	4.32	332
915		14.80	0.10	18.74	0.338	22.3	0.00	4.24	350
920		14.81	0.11	18.66	0.335	20.9	0.00	4.16	365
925		14.82	0.12	18.54	0.334	17.8	0.00	4.13	372
930		14.84	0.14	18.45	0.334	15.1	0.00	4.14	377
935		14.85	0.15	18.34	0.333	13.5	0.00	4.19	381
940	↓	14.87	0.17						
	Sample Time		945						
	Sample ID		GW-071150-042519-~~DUP~~-SAG-001						
			Containers and preservatives		*Analysis*				
			2x VOAs	VOCs					

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Bluewater

Ref. No.: 077150

Date: 4/25/19

Personnel: S. Grau

Monitoring Well Data:

Well ID: TW-10

Measured Well Depth (ft): 22.95

Screen Length (ft): 10

Well Diameter, D (in): 2"

Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: peristaltic

Depth to Pump Intake (ft)[1]: 18.5

Initial Depth to Water (ft): 14.41

Total Volume Purged (gal):

pump start @ 0949

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
955	60	14.50	0.09 0.08	18.80	0.109	255	0.00	5.18	107
1000	↓	14.54	0.13	18.85	0.086	368	0.00	4.84	133
1005		14.57	0.16	18.96	0.081	224	0.00	4.47	204
1010		14.59	0.18	19.07	0.083	221	0.00	4.44	221
1015		14.62	0.21	19.23	0.083	~~376~~ 53.4	0.00	4.42	216
1020		14.65	0.24	19.48	0.083	33.2	0.00	4.42	215
1025		14.68	0.27	19.95	0.083	21.3	0.00	4.44	212
1030		14.71	0.30	20.26	0.083	13.2	0.00	4.44	209
1035	↓	14.74	0.33	20.58	0.083	8.75	0.00	4.45	209
	Sample Time		1040						
	Sample ID		GW-077150-042519-SAG-002						
			Containers and preservatives		Analysis				
			3 x VOAs (VOCs)						

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Bluewater
Ref. No.: 077150

Date: 4/25/19
Personnel: S. Green

Monitoring Well Data:

Well ID: TW-4
Measured Well Depth (ft): 24.72
Screen Length (ft): 10'
Well Diameter, D (in): 1"
Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: peristaltic
Depth to Pump Intake (ft)[1]: 20
Initial Depth to Water (ft): 12.95
Total Volume Purged (gal):

pump start @ 1044

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
1050	60	13.07	0.12	22.19	0.071	543	0.64	4.85	193
1055	↓	13.11	0.16	22.38	0.069	174	0.49	4.68	262
1100		13.14	0.19	22.43	0.068	93.2	0.43	4.69	283
1105		13.18	0.23	22.54	0.067	59.1	0.37	4.71	289
1110		13.21	0.25	22.62	0.067	38.8	0.32	4.72	290
1115		13.24	0.28	22.80	0.067	25.2	0.18	4.74	291
1120		13.28	0.32	22.89	0.067	20.1	0.10	4.76	292
1125	↓	13.31	0.35	22.96	0.067	19.3	0.09	4.76	293
	Sample Time		1130, 1135						
	Sample ID		EW-077150-042519-SAG-003, -004 (DUP)						
			Containers and preservatives		Analysis				
			3x VOAs (VOCs)						

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Riverwater
Ref. No.: 77150

Date: 4/25/19
Personnel: S. Gray

Monitoring Well Data:

Well ID: MW-15
Measured Well Depth (ft): 29.12
Screen Length (ft): 10'
Well Diameter, D (in): 2"
Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: pump/bladder
Depth to Pump Intake (ft)[1]: 24
Initial Depth to Water (ft): 16.58
Total Volume Purged (gal):

pump start @ 1137

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
1145	60	16.58	0.00	24.55	7.66	341	0.00	6.62	222
1150	↓	16.58	0.00	24.40	4.68	330	0.00	7.58	206
1155		16.58	0.00	24.31	5.12	291	0.00	7.50	210
1200		16.58	0.00	24.26	5.49	202	0.00	7.27	229
1205		16.58	0.00	24.13	6.26	101	0.00	6.56	292
1210		16.58	0.00	23.98	6.45	68.9	0.01	6.18	312
1215		16.58	0.00	23.91	6.51	62.2	0.06	6.07	317
1220	↓	16.58	0.00	23.79	6.54	59.9	0.05	6.04	321
	Sample Time		1225						
	Sample ID		GW-077150-042519-SAG-005						
			Containers and preservatives		Analysis				
			3x VOAs (VOCs)						

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Riverwatch
Ref. No.: 77150

Date: 4/25/19
Personnel: S. Grace

Monitoring Well Data:

Well ID: MW-5
Measured Well Depth (ft): 30.28
Screen Length (ft): 10'
Well Diameter, D (in): 2"
Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: peristaltic
Depth to Pump Intake (ft)[1]: 25
Initial Depth to Water (ft): 19.19
Total Volume Purged (gal):

pump start @ 1231

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
1240	50	19.28	0.09 0.00	22.60	9.20	14.9	16.50	13.15	63
1245	↓	19.33	0.14	22.69	8.41	15.6	97.27	13.13	30
1250		19.37	0.18	22.25	7.99	27.1	18.15	13.13	23
1255		19.42	0.23	22.11	7.87	14.6	18.45	13.12	22
1300		19.46	0.27	21.81	7.80	17.7	19.37	13.13	20
1305		19.51	0.32	21.78	7.80	14.0	19.41	13.13	21
1310		19.56	0.37	21.68	7.84	20.9	19.46	13.14	24
1315		19.60	0.41	21.69	7.85	14.1	19.50	13.14	25
1320	↓	19.64	0.45	21.60	7.86	12.5	19.53	13.14	25
	Sample Time		1325						
	Sample ID		GW-077150-042519-SAG-006						
			Containers and preservatives		Analysis				
			2x VOAs (HCl)						

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Bluewater
Ref. No.: 077150

Date: 7/26/19
Personnel: S. Gray

Monitoring Well Data:

Well ID: MW-6
Measured Well Depth (ft): 29.89
Screen Length (ft): 10
Well Diameter, D (in): _____
Total Volume in Well (gal): _____

Purging/Sampling Data:

Purging/Sampling Device: peristaltic
Depth to Pump Intake (ft)[1]: 25
Initial Depth to Water (ft): 18.79
Total Volume Purged (gal): _____

pump start 0755

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
0805	60	18.84	0.05	22.53	0.319	3.50	0.40	5.17	306
0810	↓	18.86	0.07	22.28	0.325	1.49	0.00	4.59	370
0815		18.88	0.09	22.09	0.325	0.32	0.00	4.54	384
0820		18.89	0.10	21.90	0.324	0.00	0.00	4.53	394
0825		18.90	0.11	21.75	0.324	0.00	0.00	4.52	399
0830		18.91	0.12	21.57	0.324	0.00	0.00	4.52	401
0835		18.91	0.12	21.56	0.324	0.00	0.00	4.51	403
0840		18.91	0.12	21.51	0.323	0.00	0.00	4.50	405

Sample Time: 0845
Sample ID: GW-077150-072619-SAG-001

Containers and preservatives	Analysis
2x VOAs (VOCs)	VOCs

PERSULFATE = 0.0

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Bluewater
Ref. No.: 077150

Date: 7/26/19
Personnel: S. Grace

Monitoring Well Data:

Well ID: TW-10
Measured Well Depth (ft): 24.69
Screen Length (ft): 10'
Well Diameter, D (in): 1"
Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: peristaltic
Depth to Pump Intake (ft)[1]: 20
Initial Depth to Water (ft): 15.15
Total Volume Purged (gal):

pump start @ 850

Time	*Pumping Rate [2] (mL/min)*	*Depth to Water (ft)*	*Drawdown from Initial Water Level [2] (ft)*	*Temperature °C*	*Conductivity (mS/cm)*	*Turbidity NTU*	*DO (mg/L)*	*pH*	*ORP (mV)*
			Precision Required [4]:	*±3 %*	*±0.005 or 0.01 [3]*	*±10 %*	*±10 %*	*±0.1 Units*	*±10 mV*
0900	60	15.21	0.06	20.83	0.103	871	0.00	5.24	225
0905	|	15.25	0.10	20.68	0.095	574	0.00	4.87	284
0910	|	15.28	0.13	20.79	0.091	415	0.00	4.70	323
0915	|	15.32	0.17	20.82	0.089	358	0.00	4.70	339
0920	|	15.37	0.22	20.85	0.087	260	0.00	4.71	340
0925	|	15.41	0.26	20.88	0.080	249	0.00	4.72	337
0930	|	15.45	0.30	20.90	0.078	241	0.00	4.74	334
0935	V	15.48	0.33	20.93	0.077	238	0.00	4.76	332
	Sample Time		0940						
	Sample ID								
			Containers and preservatives			*Analysis*			
			GW-077150-072619-SAG-002						
						VOCs			
			2x VOAs						
			PERSULFATE = 2.5						

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Bluewater
Ref. No.: 077150

Date: 7/26/19
Personnel: S. Grace

Monitoring Well Data:

Well ID: MW-19-16
Measured Well Depth (ft): 29.14
Screen Length (ft): 10'
Well Diameter, D (in): 1"
Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: peristaltic
Depth to Pump Intake (ft)[1]: 24
Initial Depth to Water (ft): 18.46
Total Volume Purged (gal):

pump start @ 0955

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
1005	60	18.48	0.02	22.40	0.307	63.5	0.43	4.59	516
1010	"	18.49	0.03	23.32	0.691	50.3	0.71	4.61	529
1015	"	18.50	0.04	23.13	0.785	41.4	0.71	4.61	543
1020	"	18.51	0.05	23.76	3.96	34.6	2.18	4.47	604
1025	"	18.52	0.06	24.15	5.54	31.5	3.44	4.34	621
1030	"	18.52	0.06	24.68	6.87	27.3	3.90	4.35	637
1035	"	18.53	0.07	25.09	7.12	24.8	4.21	4.35	649
1040	"	18.53	0.07	25.92	7.14	23.7	4.25	4.38	653
1045	"	18.53	0.07	26.36	7.17	23.1	4.28	4.40	659
	Sample Time		1050, 1055						
	Sample ID		GW-077150-077619-JAG-003, -004 (DUP)						
			Containers and preservatives			Analysis			
			2x VOAs			VOCs			
			PERSULFATE = 5.5						

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Bluewater
Ref. No.: 077150

Date: 7/26/19
Personnel: S. Grace

Monitoring Well Data:

Well ID: TW-9
Measured Well Depth (ft): 24.70
Screen Length (ft): 10'
Well Diameter, D (in):
Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: Peristaltic
Depth to Pump Intake (ft)[1]: 20
Initial Depth to Water (ft): 15.39
Total Volume Purged (gal):

pump start @ 1100

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
1110	60	15.40	0.01	24.04	0.229	196	0.75	4.73	627
1115		15.44	0.11	23.14	0.329	84.3	0.70	4.65	611
1120		15.47	0.14	21.97	0.352	58.1	0.62	4.61	605
1125		15.50	0.17	21.97	0.354	38.3	0.44	4.60	605
1130		15.54	0.21	21.88	0.352	31.1	0.39	4.59	606
1135		15.57	0.24	21.85	0.313	17.9	0.27	4.60	605
1140		15.60	0.27	21.83	0.298	12.4	0.22	4.61	603
1145		15.64	0.31	21.79	0.295	11.2	0.24	4.61	602
1150	↓	15.67	0.34	21.76	0.293	13.1	0.20	4.62	600
	Sample Time		1155						
	Sample ID		GW-077150-072619-SAG-005						
			Containers and preservatives			Analysis			
			2 x VOAs			VOCs			
			PERSULFATE: 1.0						

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Bluewater
Ref. No.: 077150

Date: 7/26/19
Personnel: S. Cowell

Monitoring Well Data:

Well ID: MW-5
Measured Well Depth (ft): 30.18
Screen Length (ft): 10'
Well Diameter, D (in): 2"
Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: peristaltic
Depth to Pump Intake (ft)[1]: 25.5
Initial Depth to Water (ft): 21.06
Total Volume Purged (gal):

pump start @ 1200

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
1210	60	21.12	0.06	24.59	1.60	56.1	9.27	11.16	125
1215	↓	21.16	0.10	23.99	1.59	52.4	9.34	11.21	108
1220		21.19	0.13	23.84	1.58	47.3	9.37	11.24	100
1225		21.22	0.16	23.62	1.61	45.0	9.59	11.26	94
1230		21.26	0.20	23.59	1.63	42.2	9.83	11.27	89
1235		21.30	0.24	23.64	1.74	42.7	10.02	11.30	85
1240		21.33	0.27	23.78	1.81	42.2	10.09	11.33	83
1245		21.27	0.31	23.76	1.86	39.3	10.11	11.34	81
1250	↓	21.31	0.35	23.72	1.85	38.5	10.12	11.36	78
	Sample Time		1255						
	Sample ID		GW-077150-072619-SAG-006						
			Containers and preservatives			Analysis			
			PERSULFATE = 4.0						

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Bluewater
Ref. No.: 077150

Date: 4/28/20
Personnel: S. Gross

Monitoring Well Data:

Well ID: MW-6
Measured Well Depth (ft): 29.90
Screen Length (ft): 10'
Well Diameter, D (in): 2"
Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: peristaltic
Depth to Pump Intake (ft)[1]: 25
Initial Depth to Water (ft): 15.99
Total Volume Purged (gal):

pump start @ 0906

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
915	60	16.07	0.08	17.57	0.348	15.2	3.29	4.89	196
920	↓	16.10	0.11	17.26	0.347	13.9	2.41	4.76	212
925		16.12	0.13	17.09	0.346	11.3	2.10	4.72	239
930		16.14	0.15	16.91	0.345	9.22	1.97	4.66	251
935		16.15	0.16	16.78	0.345	7.98	1.85	4.62	278
940		16.15	0.16	16.77	0.345	7.47	1.81	4.61	284
945		16.16	0.17	16.75	0.344	7.03	1.78	4.60	288
950		16.17	0.18	16.75	0.343	6.51	1.82	4.60	296
955		16.17	0.18	16.72	0.343	6.76	1.84	4.60	293
1000	↓	16.17	0.18	16.70	0.344	5.97	1.82	4.59	295
	Sample Time		1005						
	Sample ID		GW-077150-042820-SAG-001						
			Containers and preservatives			Analysis			
			VOCs						

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Bluewater
Ref. No.: 071150

Date: 4/28/20
Personnel: S. Brace

Monitoring Well Data:

Well ID: TW-11
Measured Well Depth (ft): 24.30
Screen Length (ft): 10'
Well Diameter, D (in): 1"
Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: peristaltic
Depth to Pump Intake (ft)[1]: 20'
Initial Depth to Water (ft): 14.91
Total Volume Purged (gal):

pump start @ 1008

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
1020	60	15.01	0.10	17.64	0.084	123	2.24	5.00	161
1025		15.05	0.14	17.76	0.086	76.0	2.29	4.97	189
1030		15.09	0.18	17.92	0.088	42.9	2.30	4.92	201
1035		15.12	0.21	18.01	0.089	34.7	2.33	4.90	210
1040		15.15	0.24	18.09	0.088	26.4	1.87	4.94	213
1045		15.18	0.27	18.13	0.088	19.3	1.88	4.95	217
1050		15.20	0.29	18.52	0.086	17.3	2.20	4.94	221
1055		15.22	0.31	18.83	0.084	16.5	2.29	4.93	225
1100	↓	15.25	0.34	18.89	0.085	16.3	2.24	4.93	227

Sample Time: 1105
Sample ID: GW-071150-042820-SAG-002

Containers and preservatives	Analysis
VOCs	

Notes:

(1) The pump intake will be placed at mid-point of the well screen.
(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).
(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.
(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Bluewater
Ref. No.: 077150

Date: 4/28/20
Personnel: S. Grau

Monitoring Well Data:

Well ID: TW-10
Measured Well Depth (ft): 24.72
Screen Length (ft): 10'
Well Diameter, D (in): 1"
Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: pump/bailer
Depth to Pump Intake (ft)[1]: 19.75
Initial Depth to Water (ft): 14.10
Total Volume Purged (gal):

pump start @ 1109

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
1120	60	14.17	0.07	20.29	0.304	329	7.57	4.31	249
1125		14.20	0.10	19.77	0.301	208	6.82	4.40	282
1130		14.24	0.14	19.40	0.298	167	6.19	4.43	315
1135		14.28	0.18	19.37	0.293	59.6	6.02	4.50	364
1140		14.31	0.21	19.43	0.309	40.9	5.76	4.53	378
1145		14.34	0.24	19.53	0.284	27.3	5.87	4.53	389
1150		14.37	0.27	19.69	0.288	16.0	5.93	4.53	396
1155		14.39	0.29	19.76	0.287	9.49	5.98	4.52	399
1200		14.42	0.32	19.97	0.285	5.05	6.01	4.54	400
1205		14.45	0.35	20.05	0.282	5.82	5.99	4.54	403
1210		14.47	0.37	20.09	0.281	6.67	5.96	4.54	405
	Sample Time		1215						
	Sample ID		GW-077150-042820-SAG-003						
			Containers and preservatives			Analysis			
			VOCs						

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Bluewater
Ref. No.: 077150

Date: 4/28/20
Personnel: S. Grau

Monitoring Well Data:

Well ID: MW-15-16
Measured Well Depth (ft): 29.14
Screen Length (ft): 10'
Well Diameter, D (in): 2"
Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: peristaltic
Depth to Pump Intake (ft)[1]: 24
Initial Depth to Water (ft): 17.61
Total Volume Purged (gal):

pump start @ 1221

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
1235	60	17.66	0.05	21.86	2.02	126	26.42	7.03	484
1240		17.67	0.06	22.19	252	115	22.96	7.29	479
1245		17.69	0.08	22.51	2.97	109	21.84	7.54	476
1250		17.71	0.10	22.81	3.30	113	21.47	8.20	467
1255		17.72	0.11	23.28	3.49	121	21.03	8.48	460
1300		17.73	0.12	23.36	3.68	116	21.06	9.11	422
1305		17.75	0.14	23.54	3.96	109	21.10	9.42	375
1310		17.77	0.16	23.64	4.38	71.9	21.02	9.75	351
1315		17.78	0.17	23.72	4.60	63.8	20.93	9.96	338
1320		17.79	0.18	23.50	4.68	44.5	21.04	10.00	331
1325		17.80	0.19	23.42	4.73	40.9	21.14	10.07	330
	Sample Time		1330, 1335						
	Sample ID		GW-077150-042820-SAG-0004, -0005 (DUP)						
			Containers and preservatives		Analysis				
			VOCs						

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

LOW-FLOW PURGING & SAMPLING RECORD

Project Data:

Project Name: Bluewater
Ref. No.: 077150

Date: 4/28/20
Personnel: S. Brou

Monitoring Well Data:

Well ID: MW-5
Measured Well Depth (ft): 30.21
Screen Length (ft): 10'
Well Diameter, D (in): 2"
Total Volume in Well (gal):

Purging/Sampling Data:

Purging/Sampling Device: peristaltic
Depth to Pump Intake (ft)[1]: 25
Initial Depth to Water (ft): 20.01
Total Volume Purged (gal):

pump start @ 1340

Time	Pumping Rate [2] (mL/min)	Depth to Water (ft)	Drawdown from Initial Water Level [2] (ft)	Temperature °C	Conductivity (mS/cm)	Turbidity NTU	DO (mg/L)	pH	ORP (mV)
			Precision Required [4]:	±3 %	±0.005 or 0.01 [3]	±10 %	±10 %	±0.1 Units	±10 mV
1350	60	20.09	0.08	24.47	3.42	11.5	10.42	10.23	183
1355	↓	20.14	0.13	24.35	3.37	10.9	10.45	10.27	160
1400		20.18	0.17	24.30	3.34	11.6	10.48	10.29	149
1405		20.22	0.21	24.27	3.27	15.1	10.37	10.31	138
1410		20.25	0.24	24.29	3.23	11.2	10.32	10.33	128
1415		20.28	0.27	24.41	3.21	13.0	10.19	10.32	121
1420		20.30	0.29	24.55	3.21	9.11	10.11	10.32	117
1425		20.33	0.32	24.63	3.21	8.43	10.20	10.33	113
1430		20.36	0.35	24.78	3.20	7.91	10.29	10.34	109
1435		20.38	0.37	24.90	3.18	7.39	10.33	10.35	106
1440	↓	20.40	0.39	25.13	3.17	7.35	10.36	10.35	105
	Sample Time		1445						
	Sample ID		GW-077150-042820-SAG-006						
			Containers and preservatives			Analysis			
			VOCs						

Notes:

(1) The pump intake will be placed at mid-point of the well screen.

(2) The drawdown from the initial water level should be minimal. The pumping rate should be adjusted to minimize drawdown (between 50 and 500 mL/min).

(3) For conductivity, the average value of three readings <1 mS/cm ±0.005 mS/cm or where conductivity >1 mS/cm ±0.01 mS/cm.

(4) For other parameter precisions required, see the above listed.

Appendix D
Groundwater Performance Sampling Data Validation Memorandum and Laboratory Reports (January, April and July 2019)

Memorandum

August 7, 2019
Revised August 26, 2019

To:	Terefe Mazengia	Ref. No.:	077150
From:	Paul McMahon/adh/11	Tel:	716-205-1970

Subject: **Analytical Results and Reduced Validation**
Site-Wide Groundwater Sampling Event
Blue Water Thermal Solutions LLC
Fountain Inn, South Carolina
April and July 2019

1. Introduction

This document details a reduced validation of analytical results for groundwater samples collected in support of the Site-Wide Groundwater Sampling Event at the Blue Water Thermal Solutions LLC site located in Fountain Inn, South Carolina during April and July 2019. Samples were submitted to Analytical Environmental Services, Inc (AES) located in Atlanta, Georgia. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Standard GHD report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody forms, finished report forms, method blank data, recovery data from surrogate spikes/laboratory control samples (LCS), matrix spikes (MS), and field QA/QC samples.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the document entitled:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review", United States Environmental Protection Agency (USEPA) 540-R-08-01, June 2008

Item i) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. Sample chain of custody documents and the analytical reports were used to determine sample holding times. All samples were analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Method Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, a laboratory method blank was analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

4. Surrogate Spike Recoveries

In accordance with the method employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for volatile organic compounds (VOCs) determinations were spiked with the appropriate number of surrogate compounds prior to sample analysis.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries were acceptable.

5. Laboratory Control Sample Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects.

For this study, an LCS was analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS contained all compounds of interest. The LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.

6. Matrix Spike Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS samples.

The MS analysis was performed by the laboratory internally. The MS sample was spiked with all compounds of interest. Most percent recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy. Low MS recoveries were reported for three VOCs. The associated sample results were either rejected or qualified as non-detect based on the indicated low bias (see Table 4).

7. Duplicate Sample Analyses

Analytical precision is evaluated based on the analysis of laboratory duplicate samples. For this study, duplicate samples were prepared and analyzed by the laboratory internally. All duplicate analyses performed were acceptable, demonstrating acceptable analytical precision.

8. Field QA/QC Samples

The field QA/QC consisted of two trip blank samples and two field duplicate sample sets.

Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, two trip blank samples were submitted to the laboratory for VOCs analysis. Most results were non-detect for the compounds of interest. VOCs were detected in the July trip blank; all associated sample results were non-detect and were not impacted.

Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, two field duplicate sample sets were collected and submitted "blind" to the laboratory, as specified in Table 1. The relative percent difference (RPDs) associated with these duplicate samples must be less than 50 percent for water samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criterion is one times the RL value.

All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision.

9. Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the RL but greater than the MDL were reported as estimated (J) in Table 2. Non-detect results were presented as non-detect at the RL in Table 2.

10. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable with the specific exception and qualifications noted herein.

Table 1

Sample Collection and Analysis Summary
Site-Wide Groundwater Sampling Event
Blue Water Thermal Solutions LLC
Fountain Inn, South Carolina
April and July 2019

Sample Identification	Location	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameter: VOCs	Comments
GW-077150-042519-SAG-005	MW-1S_2016	04/25/2019	12:25:00	X	
GW-077150-072619-SAG-003	MW-1S_2016	07/26/2019	10:50:00	X	
GW-077150-072619-SAG-004	MW-1S_2016	07/26/2019	10:55:00	X	Duplicate of GW-077150-072619-SAG-003
GW-077150-042519-SAG-006	MW-5_2016	04/25/2019	13:25:00	X	
GW-077150-072619-SAG-006	MW-5_2016	07/26/2019	12:55:00	X	
GW-077150-042519-SAG-001	MW-6_2016	04/25/2019	09:45:00	X	
GW-077150-072619-SAG-001	MW-6_2016	07/26/2019	08:45:00	X	
GW-077150-042519-SAG-003	TW-10	04/25/2019	11:30:00	X	
GW-077150-042519-SAG-004	TW-10	04/25/2019	11:35:00	X	Duplicate of GW-077150-042519-SAG-003
GW-077150-072619-SAG-005	TW-10	07/26/2019	11:55:00	X	
GW-077150-042519-SAG-002	TW-11	04/25/2019	10:40:00	X	
GW-077150-072619-SAG-002	TW-11	07/26/2019	09:40:00	X	

Notes:

VOCs - Volatile Organic Compounds

Table 2

Analytical Results Summary
Site-Wide Groundwater Sampling Event
Blue Water Thermal Solutions LLC
Fountain Inn, South Carolina
April and July 2019

Location ID:		MW-1S 2016	MW-1S 2016	MW-1S 2016
Sample Name:		GW-077150-042519-SAG-005	GW-077150-072619-SAG-003	GW-077150-072619-SAG-004
Sample Date:		04/25/2019	07/26/2019	07/26/2019 Duplicate
Parameters	**Unit**			
Volatile Organic Compounds				
1,1,1,2-Tetrachloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1.0 U	1.2	1.1
1,1-Dichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	5.0 U	5.0 U	5.0 U
2-Hexanone	µg/L	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	5.0 U	5.0 U	5.0 U
Acetone	µg/L	41	23	27
Benzene	µg/L	1.0 U	1.0 U	1.0 U
Bromodichloromethane	µg/L	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	1.0 U	2.1	2.4
Bromomethane (Methyl bromide)	µg/L	6.4	1.0 U	1.0 U
Carbon disulfide	µg/L	2.3	2.0	1.0 U
Carbon tetrachloride	µg/L	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	1.0	1.2	1.5
Chloromethane (Methyl chloride)	µg/L	3.8	1.5	1.5
cis-1,2-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	1.0 U	1.0 U	1.0 U

Table 2

Analytical Results Summary
Site-Wide Groundwater Sampling Event
Blue Water Thermal Solutions LLC
Fountain Inn, South Carolina
April and July 2019

	Location ID:	MW-1S 2016	MW-1S 2016	MW-1S 2016
	Sample Name:	GW-077150-042519-SAG-005	GW-077150-072619-SAG-003	GW-077150-072619-SAG-004
	Sample Date:	04/25/2019	07/26/2019	07/26/2019 Duplicate
Parameters	**Unit**			
Volatile Organic Compounds				
Isopropyl benzene	µg/L	1.0 U	1.0 U	1.0 U
Methyl acetate	µg/L	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	µg/L	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	µg/L	1.0 U	1.0 U	1.0 U
Methylene chloride	µg/L	2.0 U	2.0 U	2.0 U
Styrene	µg/L	1.0 U	R	1.0 U
Tetrachloroethene	µg/L	480	520	500
Toluene	µg/L	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	1.8	1.3	1.3
Trichlorofluoromethane (CFC-11)	µg/L	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	µg/L	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	1.0 U	1.0 UJ	1.0 U
Xylenes (total)	µg/L	1.0 U	1.0 UJ	1.0 U

Table 2

Analytical Results Summary
Site-Wide Groundwater Sampling Event
Blue Water Thermal Solutions LLC
Fountain Inn, South Carolina
April and July 2019

Location ID:		MW-5 2016	MW-5 2016	MW-6 2016
Sample Name:		GW-077150-042519-SAG-006	GW-077150-072619-SAG-006	GW-077150-042519-SAG-001
Sample Date:		04/25/2019	07/26/2019	04/25/2019
Parameters	**Unit**			
Volatile Organic Compounds				
1,1,1,2-Tetrachloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	1.0 U	1.0 U	8.7
1,1-Dichloroethene	µg/L	1.0 U	1.0 U	34
1,2,4-Trichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	5.0 U	5.0 U	5.0 U
2-Hexanone	µg/L	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	5.0 U	5.0 U	5.0 U
Acetone	µg/L	46	19	5.0 U
Benzene	µg/L	1.0 U	1.0 U	1.0 U
Bromodichloromethane	µg/L	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	1.0 U	1.0 U	1.0 U
Carbon disulfide	µg/L	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	1.0 U	0.48 J	1.0 U
cis-1,2-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	1.0 U	1.0 U	1.0 U

Table 2

Analytical Results Summary
Site-Wide Groundwater Sampling Event
Blue Water Thermal Solutions LLC
Fountain Inn, South Carolina
April and July 2019

Location ID:		MW-5 2016	MW-5 2016	MW-6 2016
Sample Name:		GW-077150-042519-SAG-006	GW-077150-072619-SAG-006	GW-077150-042519-SAG-001
Sample Date:		04/25/2019	07/26/2019	04/25/2019
Parameters	**Unit**			
Volatile Organic Compounds				
Isopropyl benzene	µg/L	1.0 U	1.0 U	1.0 U
Methyl acetate	µg/L	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	µg/L	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	µg/L	1.0 U	1.0 U	1.0 U
Methylene chloride	µg/L	2.0 U	2.0 U	2.0 U
Styrene	µg/L	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	14	21	1.0 U
Toluene	µg/L	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	1.0 U	1.0 U	1.0
Trichlorofluoromethane (CFC-11)	µg/L	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	µg/L	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	1.0 U	1.0 U	1.0 U
Xylenes (total)	µg/L	1.0 U	1.0 U	1.0 U

Table 2

Analytical Results Summary
Site-Wide Groundwater Sampling Event
Blue Water Thermal Solutions LLC
Fountain Inn, South Carolina
April and July 2019

Location ID:		MW-6 2016	TW-10	TW-10
Sample Name:		GW-077150-072619-SAG-001	GW-077150-042519-SAG-003	GW-077150-042519-SAG-004
Sample Date:		07/26/2019	04/25/2019	04/25/2019 Duplicate
Parameters	**Unit**			
Volatile Organic Compounds				
1,1,1,2-Tetrachloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	7.8	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	31	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	5.0 U	5.0 U	5.0 U
2-Hexanone	µg/L	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	5.0 U	5.0 U	5.0 U
Acetone	µg/L	5.0 U	5.1	5.0 U
Benzene	µg/L	1.0 U	1.0 U	1.0 U
Bromodichloromethane	µg/L	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	1.0 U	1.0 U	1.0 U
Carbon disulfide	µg/L	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	0.24 J	0.64 J	0.77 J
Chloromethane (Methyl chloride)	µg/L	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	1.0 U	2.5	2.5
cis-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	1.0 U	1.0 U	1.0 U

Table 2

Analytical Results Summary
Site-Wide Groundwater Sampling Event
Blue Water Thermal Solutions LLC
Fountain Inn, South Carolina
April and July 2019

Location ID:		MW-6 2016	TW-10	TW-10
Sample Name:		GW-077150-072619-SAG-001	GW-077150-042519-SAG-003	GW-077150-042519-SAG-004
Sample Date:		07/26/2019	04/25/2019	04/25/2019 Duplicate
Parameters	**Unit**			
Volatile Organic Compounds				
Isopropyl benzene	µg/L	1.0 U	1.0 U	1.0 U
Methyl acetate	µg/L	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	µg/L	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	µg/L	1.0 U	1.0 U	1.0 U
Methylene chloride	µg/L	2.0 U	2.0 U	2.0 U
Styrene	µg/L	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	1.0 U	910	910
Toluene	µg/L	1.0 U	1.8	1.8
trans-1,2-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	1.0	19	19
Trichlorofluoromethane (CFC-11)	µg/L	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	µg/L	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	1.0 U	1.0 U	1.0 U
Xylenes (total)	µg/L	1.0 U	1.0 U	1.0 U

Table 2

Analytical Results Summary
Site-Wide Groundwater Sampling Event
Blue Water Thermal Solutions LLC
Fountain Inn, South Carolina
April and July 2019

Location ID:		TW-10	TW-11	TW-11
Sample Name:		GW-077150-072619-SAG-005	GW-077150-042519-SAG-002	GW-077150-072619-SAG-002
Sample Date:		07/26/2019	04/25/2019	07/26/2019
Parameters	**Unit**			
Volatile Organic Compounds				
1,1,1,2-Tetrachloroethane	µg/L	1.0 U	2.7	1.0 U
1,1,1-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	5.0 U	5.0 U	5.0 U
2-Hexanone	µg/L	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	5.0 U	5.0 U	5.0 U
Acetone	µg/L	12	4.0 J	5.0 U
Benzene	µg/L	1.0 U	1.0 U	1.0 U
Bromodichloromethane	µg/L	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	1.0 U	1.0 U	1.0 U
Carbon disulfide	µg/L	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	0.76 J	0.83 J	1.0 U
Chloromethane (Methyl chloride)	µg/L	0.91 J	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	2.0	2.8	0.44 J
cis-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	1.0 U	1.0 U	1.0 U

Table 2

Analytical Results Summary
Site-Wide Groundwater Sampling Event
Blue Water Thermal Solutions LLC
Fountain Inn, South Carolina
April and July 2019

Location ID:		**TW-10**	**TW-11**	**TW-11**
Sample Name:		**GW-077150-072619-SAG-005**	**GW-077150-042519-SAG-002**	**GW-077150-072619-SAG-002**
Sample Date:		**07/26/2019**	**04/25/2019**	**07/26/2019**
Parameters	**Unit**			
Volatile Organic Compounds				
Isopropyl benzene	µg/L	1.0 U	1.0 U	1.0 U
Methyl acetate	µg/L	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	µg/L	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	µg/L	1.0 U	1.0 U	1.0 U
Methylene chloride	µg/L	2.0 U	2.0 U	2.0 U
Styrene	µg/L	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	1300	960	310
Toluene	µg/L	4.0	33	32
trans-1,2-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	19	24	5.8
Trichlorofluoromethane (CFC-11)	µg/L	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (CFC-113)	µg/L	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	1.0 U	1.0 U	1.0 U
Xylenes (total)	µg/L	1.0 U	1.0 U	1.0 U

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected

Table 3

Analytical Methods
Site-Wide Groundwater Sampling Event
Blue Water Thermal Solutions LLC
Fountain Inn, South Carolina
April and July 2019

Parameter	Method	Matrix	Holding Time Collection to Analysis (Days)
VOCs	SW-846 8260D	Water	14

Notes:

VOCs - Volatile Organic Compounds

Method Reference:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

Table 4

Qualified Sample Results Due to Outlying Matrix Spike Results
Site-Wide Groundwater Sampling Event
Blue Water Thermal Solutions LLC
Fountain Inn, South Carolina
April and July 2019

Parameter	Sample ID	Analyte	MS % Recovery	Control Limits % Recovery	Qualified Result
VOCs	GW-077150-072619-SAG-003	Styrene	3	71-137	R
		Vinyl chloride	48	63-148	1.0 UJ
		Xylenes (total)	17	78-138	1.0 UJ

Notes:

MS - Matrix Spike
VOCs - Volatile Organic Compounds
R - Rejected
UJ - Not detected; associated reporting limit is estimated

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

January 23, 2019

Terefe Mazengia
GHD Services, Inc.

3075 Breckenridge Blvd., Suite 470
Duluth GA 30096

RE: Bluewater Thermal Solutions

Dear Terefe Mazengia: Order No: 1901D90

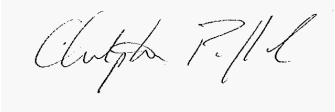
Analytical Environmental Services, Inc. received 3 samples on 1/16/2019 10:08:00 AM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative. AES' certifications are as follows:
-South Carolina Certification number 98016003 for Clean Water Act and for Solid and Hazardous Waste, effective until 6/30/19.

These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,



Chris Pafford

Project Manager

3080 Presidential Drive • Atlanta, Georgia 30340 • Tel: 770.457.8177 • Fax: 770.457.8188 • Toll Free: 800.972.4889
www.aesatlanta.com

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 Presidential Drive Atlanta, GA 30340-3704
Phone: (770) 457-8177 / Toll-Free: (800) 972-4889 / Fax: (770) 457-8188

AES

CHAIN OF CUSTODY

Work Order: 1901090

Date: 1/14/19 Page 1 of 1

COMPANY:	ADDRESS:
GHD	3075 Breckinridge Blvd. Ste 470 Duluth, GA 30096
PHONE: 770-441-0027	EMAIL: steve.grace@ghd.com
SAMPLED BY: Steven Grace	SIGNATURE:

#	SAMPLE ID	SAMPLED: DATE	SAMPLED: TIME	GRAB	COMPOSITE	MATRIX (see codes)	ANALYSIS REQUESTED: VOC 5	PRESERVATION (see codes)	REMARKS	Number of Containers
1	GW-077150-011419-SAG-001	1/14/19	1230	X		GW	X			2
2	GW-077150-011419-SAG-002	↓	1630	X		↓	X			2
3	Trip Blank						X			2
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										

Visit our website www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
1.		1. Ayden	1/16/19 10:08a
2.		2. (0.9°C)	
3.		3.	

SPECIAL INSTRUCTIONS/COMMENTS: See SSOW

SHIPMENT METHOD
OUT: / / VIA:
IN: / / VIA:
client FedEx UPS US mail courier Greyhound
other: _____

PROJECT INFORMATION
PROJECT NAME: Bluewater
PROJECT #: 077150
SITE ADDRESS: 100 Hunts Br. Rd. Fountain Inn, SC
SEND REPORT TO: See SSOW
INVOICE TO: (IF DIFFERENT FROM ABOVE) See SSOW
QUOTE #: _____ PO#: _____

RECEIPT
Total # of Containers: 6

Turnaround Time (TAT) Request
- [x] Standard 5 Business Days
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same-Day Rush (auth req.)
- [ ] Other _____

STATE PROGRAM (if any): _____
E-mail? ☐ Fax? ☐
DATA PACKAGE: I ○ II ○ III ○ IV ○

Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT. Samples are disposed of 30 days after completion of report unless other arangements are made.

Matrix Codes: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

Preservative Codes: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Analytical Environmental Services, Inc

Date: 23-Jan-19

Client: GHD Services, Inc.
Project: Bluewater Thermal Solutions
Lab ID: 1901D90

Case Narrative

Sample Receiving Nonconformance:

Sample information on the Chain of Custody (COC) did not match that on the sample bottle labels for sample "GW-077150-011419-SAG-001". Sample time on the vials is 12:00pm while the sample time on the COC is 12:30pm. Samples were logged in using the time on the sample containers per Terefe Mazengia via email 1/21/2019 9:07am.

Analytical Environmental Services, Inc **Date:** 23-Jan-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-011419-SAG-001
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	1/14/2019 12:00:00 PM
Lab ID:	1901D90-001	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS	**SW8260B**			**(SW5030B)**				
1,1,1,2-Tetrachloroethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
1,1,1-Trichloroethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
1,1,2-Trichloroethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
1,1-Dichloroethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
1,1-Dichloroethene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
1,2,4-Trichlorobenzene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
1,2-Dibromo-3-chloropropane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
1,2-Dibromoethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
1,2-Dichlorobenzene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
1,2-Dichloroethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
1,2-Dichloropropane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
1,3-Dichlorobenzene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
1,4-Dichlorobenzene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
2-Butanone	BRL	5.0		ug/L	273115	1	01/19/2019 03:35	JB
2-Hexanone	BRL	5.0		ug/L	273115	1	01/19/2019 03:35	JB
4-Methyl-2-pentanone	BRL	5.0		ug/L	273115	1	01/19/2019 03:35	JB
Acetone	8.6	5.0		ug/L	273115	1	01/19/2019 03:35	JB
Benzene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Bromodichloromethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Bromoform	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Bromomethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Carbon disulfide	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Carbon tetrachloride	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Chlorobenzene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Chloroethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Chloroform	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Chloromethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
cis-1,2-Dichloroethene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
cis-1,3-Dichloropropene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Cyclohexane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Dibromochloromethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Dichlorodifluoromethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Ethylbenzene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Freon-113	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Isopropylbenzene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Methyl acetate	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Methyl tert-butyl ether	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Methylcyclohexane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Methylene chloride	BRL	2.0		ug/L	273115	1	01/19/2019 03:35	JB
Styrene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Tetrachloroethene	4.8	1.0		ug/L	273115	1	01/19/2019 03:35	JB

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-Jan-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-011419-SAG-001
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	1/14/2019 12:00:00 PM
Lab ID:	1901D90-001	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B (SW5030B)								
Toluene	36	1.0		ug/L	273115	1	01/19/2019 03:35	JB
trans-1,2-Dichloroethene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
trans-1,3-Dichloropropene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Trichloroethene	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Trichlorofluoromethane	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Vinyl chloride	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Xylenes, Total	BRL	1.0		ug/L	273115	1	01/19/2019 03:35	JB
Surr: 4-Bromofluorobenzene	90	70-130		%REC	273115	1	01/19/2019 03:35	JB
Surr: Dibromofluoromethane	106	70-130		%REC	273115	1	01/19/2019 03:35	JB
Surr: Toluene-d8	96.9	70-130		%REC	273115	1	01/19/2019 03:35	JB

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-Jan-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-011419-SAG-002
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	1/14/2019 4:30:00 PM
Lab ID:	1901D90-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B (SW5030B)								
1,1,1,2-Tetrachloroethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
1,1,1-Trichloroethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
1,1,2-Trichloroethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
1,1-Dichloroethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
1,1-Dichloroethene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
1,2,4-Trichlorobenzene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
1,2-Dibromo-3-chloropropane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
1,2-Dibromoethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
1,2-Dichlorobenzene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
1,2-Dichloroethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
1,2-Dichloropropane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
1,3-Dichlorobenzene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
1,4-Dichlorobenzene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
2-Butanone	BRL	5.0		ug/L	273115	1	01/17/2019 22:53	JB
2-Hexanone	BRL	5.0		ug/L	273115	1	01/17/2019 22:53	JB
4-Methyl-2-pentanone	BRL	5.0		ug/L	273115	1	01/17/2019 22:53	JB
Acetone	BRL	5.0		ug/L	273115	1	01/17/2019 22:53	JB
Benzene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Bromodichloromethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Bromoform	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Bromomethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Carbon disulfide	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Carbon tetrachloride	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Chlorobenzene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Chloroethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Chloroform	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Chloromethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
cis-1,2-Dichloroethene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
cis-1,3-Dichloropropene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Cyclohexane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Dibromochloromethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Dichlorodifluoromethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Ethylbenzene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Freon-113	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Isopropylbenzene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Methyl acetate	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Methyl tert-butyl ether	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Methylcyclohexane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Methylene chloride	BRL	2.0		ug/L	273115	1	01/17/2019 22:53	JB
Styrene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Tetrachloroethene	4.7	1.0		ug/L	273115	1	01/17/2019 22:53	JB

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-Jan-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-011419-SAG-002
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	1/14/2019 4:30:00 PM
Lab ID:	1901D90-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B (SW5030B)								
Toluene	13	1.0		ug/L	273115	1	01/17/2019 22:53	JB
trans-1,2-Dichloroethene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
trans-1,3-Dichloropropene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Trichloroethene	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Trichlorofluoromethane	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Vinyl chloride	BRL	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Xylenes, Total	1.3	1.0		ug/L	273115	1	01/17/2019 22:53	JB
Surr: 4-Bromofluorobenzene	92.2	70-130		%REC	273115	1	01/17/2019 22:53	JB
Surr: Dibromofluoromethane	98.5	70-130		%REC	273115	1	01/17/2019 22:53	JB
Surr: Toluene-d8	95.2	70-130		%REC	273115	1	01/17/2019 22:53	JB

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-Jan-19

Client:	GHD Services, Inc.	**Client Sample ID:**	TRIP BLANK
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	1/14/2019
Lab ID:	1901D90-003	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B				**(SW5030B)**				
1,1,1,2-Tetrachloroethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
1,1,1-Trichloroethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
1,1,2-Trichloroethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
1,1-Dichloroethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
1,1-Dichloroethene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
1,2,4-Trichlorobenzene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
1,2-Dibromo-3-chloropropane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
1,2-Dibromoethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
1,2-Dichlorobenzene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
1,2-Dichloroethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
1,2-Dichloropropane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
1,3-Dichlorobenzene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
1,4-Dichlorobenzene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
2-Butanone	BRL	5.0		ug/L	273115	1	01/19/2019 01:37	JB
2-Hexanone	BRL	5.0		ug/L	273115	1	01/19/2019 01:37	JB
4-Methyl-2-pentanone	BRL	5.0		ug/L	273115	1	01/19/2019 01:37	JB
Acetone	BRL	5.0		ug/L	273115	1	01/19/2019 01:37	JB
Benzene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Bromodichloromethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Bromoform	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Bromomethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Carbon disulfide	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Carbon tetrachloride	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Chlorobenzene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Chloroethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Chloroform	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Chloromethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
cis-1,2-Dichloroethene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
cis-1,3-Dichloropropene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Cyclohexane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Dibromochloromethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Dichlorodifluoromethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Ethylbenzene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Freon-113	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Isopropylbenzene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Methyl acetate	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Methyl tert-butyl ether	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Methylcyclohexane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Methylene chloride	BRL	2.0		ug/L	273115	1	01/19/2019 01:37	JB
Styrene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Tetrachloroethene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 23-Jan-19

Client:	GHD Services, Inc.	**Client Sample ID:**	TRIP BLANK
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	1/14/2019
Lab ID:	1901D90-003	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260B (SW5030B)								
Toluene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
trans-1,2-Dichloroethene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
trans-1,3-Dichloropropene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Trichloroethene	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Trichlorofluoromethane	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Vinyl chloride	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Xylenes, Total	BRL	1.0		ug/L	273115	1	01/19/2019 01:37	JB
Surr: 4-Bromofluorobenzene	89.4	70-130		%REC	273115	1	01/19/2019 01:37	JB
Surr: Dibromofluoromethane	105	70-130		%REC	273115	1	01/19/2019 01:37	JB
Surr: Toluene-d8	95.6	70-130		%REC	273115	1	01/19/2019 01:37	JB

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Clear Save as

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **GHD Services, Inc.** AES Work Order Number: **1901D90**

2. Carrier: FedEx ■ UPS ☐ USPS ☐ Client ☐ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	◉	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	◉	○	○		
5.	Custody seals intact on shipping container?	◉	○	○		
6.	Temperature blanks present?	◉	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	◉	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	◉	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	○	◉	○		
10.	Sampler name and/or signature on COC?	◉	○	○		
11.	Were all samples received within holding time?	◉	○	○		
12.	TAT marked on the COC?	◉	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 0.9 °C Cooler 2 Temperature _____ °C Cooler 3 Temperature _____ °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). AP 1/16/19

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	◉	○	○		
17.	Custody seals present on sample containers?	○	◉	○		
18.	Custody seals intact on sample containers?	○	○	◉		
19.	Do sample container labels match the COC?	○	◉	○	incomplete info ☐ illegible ☐ no label ☐ other ■	
20.	Are analyses requested indicated on the COC?	◉	○	○		
21.	Were all of the samples listed on the COC received?	◉	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	◉	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	◉	○	○		
24.	Were samples received in appropriate containers?	◉	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	◉	○	○		
26.	Were trip blanks submitted?	◉	○	○	listed on COC ■ not listed on COC ☐	

27. Comments: _____

This section only applies to samples where pH can be checked at Sample Receipt.

I certify that I have completed sections 16-27 (dated initials). BC 1/16/19

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	◉		
29.	Containers meet preservation guidelines?	○	○	◉		
30.	Was pH adjusted at Sample Receipt?	○	○	◉		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). BC 1/16/19

Locked

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1901D90

ANALYTICAL QC SUMMARY REPORT

BatchID: 273115

Sample ID: **MB-273115** Client ID: Units: **ug/L** Prep Date: **01/16/2019** Run No: **389071**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **273115** Analysis Date: **01/16/2019** Seq No: **8701758**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	BRL	1.0									
1,1,1-Trichloroethane	BRL	1.0									
1,1,2-Trichloroethane	BRL	1.0									
1,1-Dichloroethane	BRL	1.0									
1,1-Dichloroethene	BRL	2.0									
1,2,4-Trichlorobenzene	BRL	1.0									
1,2-Dibromo-3-chloropropane	BRL	1.0									
1,2-Dibromoethane	BRL	1.0									
1,2-Dichlorobenzene	BRL	1.0									
1,2-Dichloroethane	BRL	1.0									
1,2-Dichloropropane	BRL	1.0									
1,3-Dichlorobenzene	BRL	1.0									
1,4-Dichlorobenzene	BRL	1.0									
2-Butanone	BRL	10									
2-Hexanone	BRL	10									
4-Methyl-2-pentanone	BRL	10									
Acetone	BRL	20									
Benzene	BRL	1.0									
Bromodichloromethane	BRL	1.0									
Bromoform	BRL	1.0									
Bromomethane	BRL	1.0									
Carbon disulfide	BRL	5.0									
Carbon tetrachloride	BRL	2.0									
Chlorobenzene	BRL	1.0									
Chloroethane	BRL	1.0									
Chloroform	BRL	1.0									
Chloromethane	BRL	1.0									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1901D90

ANALYTICAL QC SUMMARY REPORT

BatchID: 273115

Sample ID: **MB-273115** Client ID: Units: **ug/L** Prep Date: **01/16/2019** Run No: **389071**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **273115** Analysis Date: **01/16/2019** Seq No: **8701758**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	BRL	1.0									
cis-1,3-Dichloropropene	BRL	1.0									
Cyclohexane	BRL	2.0									
Dibromochloromethane	BRL	1.0									
Dichlorodifluoromethane	BRL	1.0									
Ethylbenzene	BRL	1.0									
Freon-113	BRL	5.0									
Isopropylbenzene	BRL	1.0									
Methyl acetate	BRL	2.0									
Methyl tert-butyl ether	BRL	1.0									
Methylcyclohexane	BRL	2.0									
Methylene chloride	BRL	5.0									
Styrene	BRL	1.0									
Tetrachloroethene	BRL	1.0									
Toluene	BRL	1.0									
trans-1,2-Dichloroethene	BRL	2.0									
trans-1,3-Dichloropropene	BRL	2.0									
Trichloroethene	BRL	1.0									
Trichlorofluoromethane	BRL	1.0									
Vinyl chloride	BRL	1.0									
Xylenes, Total	BRL	1.0									
Surr: 4-Bromofluorobenzene	46.14	0	50.00		92.3	70	130				
Surr: Dibromofluoromethane	52.04	0	50.00		104	70	130				
Surr: Toluene-d8	47.48	0	50.00		95.0	70	130				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1901D90

ANALYTICAL QC SUMMARY REPORT

BatchID: 273115

Sample ID: **LCS-273115** Client ID: Units: **ug/L** Prep Date: **01/16/2019** Run No: **389071**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **273115** Analysis Date: **01/16/2019** Seq No: **8701745**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	51.10	1.0	50.00		102	70	130				
1,1,1-Trichloroethane	51.56	1.0	50.00		103	70	130				
1,1,2-Trichloroethane	51.63	1.0	50.00		103	70	130				
1,1-Dichloroethane	50.20	1.0	50.00		100	70	130				
1,1-Dichloroethene	43.61	2.0	50.00		87.2	60	140				
1,2,4-Trichlorobenzene	60.01	1.0	50.00		120	70	130				
1,2-Dibromo-3-chloropropane	49.54	1.0	50.00		99.1	70	130				
1,2-Dibromoethane	50.68	1.0	50.00		101	70	130				
1,2-Dichlorobenzene	50.13	1.0	50.00		100	70	130				
1,2-Dichloroethane	50.36	1.0	50.00		101	70	130				
1,2-Dichloropropane	48.45	1.0	50.00		96.9	70	130				
1,3-Dichlorobenzene	50.45	1.0	50.00		101	70	130				
1,4-Dichlorobenzene	48.89	1.0	50.00		97.8	70	130				
Benzene	50.25	1.0	50.00		100	70	130				
Bromodichloromethane	51.83	1.0	50.00		104	70	130				
Bromoform	53.50	1.0	50.00		107	70	130				
Carbon tetrachloride	51.24	2.0	50.00		102	70	130				
Chlorobenzene	49.48	1.0	50.00		99.0	70	130				
Chloroform	51.55	1.0	50.00		103	70	130				
cis-1,2-Dichloroethene	52.10	1.0	50.00		104	70	130				
cis-1,3-Dichloropropene	55.07	1.0	50.00		110	70	130				
Dibromochloromethane	51.22	1.0	50.00		102	70	130				
Ethylbenzene	52.74	1.0	50.00		105	70	130				
Isopropylbenzene	55.01	1.0	50.00		110	70	130				
Methylene chloride	49.08	5.0	50.00		98.2	70	130				
Styrene	49.86	1.0	50.00		99.7	70	130				
Tetrachloroethene	50.21	1.0	50.00		100	70	130				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1901D90

ANALYTICAL QC SUMMARY REPORT

BatchID: 273115

Sample ID: **LCS-273115** Client ID: Units: **ug/L** Prep Date: **01/16/2019** Run No: **389071**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **273115** Analysis Date: **01/16/2019** Seq No: **8701745**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Toluene	48.87	1.0	50.00		97.7	70	130				
trans-1,2-Dichloroethene	47.51	2.0	50.00		95.0	70	130				
trans-1,3-Dichloropropene	57.75	2.0	50.00		116	70	130				
Trichloroethene	50.79	1.0	50.00		102	70	130				
Vinyl chloride	51.24	1.0	50.00		102	70	130				
Xylenes, Total	163.8	1.0	150.0		109	70	130				
Surr: 4-Bromofluorobenzene	51.45	0	50.00		103	70	130				
Surr: Dibromofluoromethane	51.10	0	50.00		102	70	130				
Surr: Toluene-d8	48.60	0	50.00		97.2	70	130				

Sample ID: **1901B17-004AMS** Client ID: Units: **ug/L** Prep Date: **01/16/2019** Run No: **389252**
SampleType: **MS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **273115** Analysis Date: **01/18/2019** Seq No: **8707745**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	62.37	1.0	50.00		125	70	139				
1,1,1-Trichloroethane	59.40	1.0	50.00		119	66.7	137				
1,1,2-Trichloroethane	59.87	1.0	50.00		120	71.8	130				
1,1-Dichloroethane	57.32	1.0	50.00		115	63.7	134				
1,1-Dichloroethene	56.06	2.0	50.00		112	63.8	146				
1,2,4-Trichlorobenzene	69.65	1.0	50.00		139	57.1	144				
1,2-Dibromo-3-chloropropane	63.97	1.0	50.00		128	56.7	133				
1,2-Dibromoethane	62.18	1.0	50.00		124	69.5	133				
1,2-Dichlorobenzene	59.87	1.0	50.00		120	68.3	135				
1,2-Dichloroethane	58.89	1.0	50.00		118	67	136				
1,2-Dichloropropane	58.37	1.0	50.00		117	70.8	130				
1,3-Dichlorobenzene	61.09	1.0	50.00	0.4700	121	65.8	136				
1,4-Dichlorobenzene	58.88	1.0	50.00		118	69.2	133				
Benzene	60.23	1.0	50.00		120	70.2	137				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1901D90

ANALYTICAL QC SUMMARY REPORT

BatchID: 273115

Sample ID: **1901B17-004AMS** Client ID: Units: **ug/L** Prep Date: **01/16/2019** Run No: **389252**
SampleType: **MS** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **273115** Analysis Date: **01/18/2019** Seq No: **8707745**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Bromodichloromethane	60.02	1.0	50.00		120	62	137				
Bromoform	59.48	1.0	50.00		119	59.7	136				
Carbon tetrachloride	63.12	2.0	50.00		126	67.7	146				
Chlorobenzene	60.01	1.0	50.00		120	72.7	141				
Chloroform	57.07	1.0	50.00		114	65.6	134				
cis-1,2-Dichloroethene	58.75	1.0	50.00		118	65.9	136				
cis-1,3-Dichloropropene	63.65	1.0	50.00		127	61.7	127				S
Dibromochloromethane	61.50	1.0	50.00		123	60.4	135				
Ethylbenzene	65.53	1.0	50.00		131	73	135				
Isopropylbenzene	68.19	1.0	50.00		136	65.9	137				
Methylene chloride	55.77	5.0	50.00		112	64.1	133				
Styrene	60.03	1.0	50.00		120	71.2	137				
Tetrachloroethene	64.21	1.0	50.00		128	67.6	146				
Toluene	58.97	1.0	50.00		118	67	141				
trans-1,2-Dichloroethene	57.12	2.0	50.00		114	64	139				
trans-1,3-Dichloropropene	64.72	2.0	50.00		129	60.3	117				S
Trichloroethene	60.69	1.0	50.00		121	69.3	141				
Vinyl chloride	62.10	1.0	50.00		124	63.2	148				
Xylenes, Total	201.0	1.0	150.0		134	77.9	138				
Surr: 4-Bromofluorobenzene	50.92	0	50.00		102	70	130				
Surr: Dibromofluoromethane	48.75	0	50.00		97.5	70	130				
Surr: Toluene-d8	48.76	0	50.00		97.5	70	130				

Sample ID: **1901B17-002ADUP** Client ID: Units: **ug/L** Prep Date: **01/16/2019** Run No: **389136**
SampleType: **DUP** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **273115** Analysis Date: **01/17/2019** Seq No: **8704168**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	BRL	1.0						0	0	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1901D90

ANALYTICAL QC SUMMARY REPORT

BatchID: 273115

Sample ID: **1901B17-002ADUP** Client ID: Units: **ug/L** Prep Date: **01/16/2019** Run No: **389136**
SampleType: **DUP** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **273115** Analysis Date: **01/17/2019** Seq No: **8704168**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	1.0						0	0	20	
1,1,2-Trichloroethane	BRL	1.0						0	0	20	
1,1-Dichloroethane	BRL	1.0						0	0	20	
1,1-Dichloroethene	BRL	2.0						0	0	20	
1,2,4-Trichlorobenzene	BRL	1.0						0	0	20	
1,2-Dibromo-3-chloropropane	BRL	1.0						0	0	20	
1,2-Dibromoethane	BRL	1.0						0	0	20	
1,2-Dichlorobenzene	BRL	1.0						0	0	20	
1,2-Dichloroethane	BRL	1.0						0	0	20	
1,2-Dichloropropane	BRL	1.0						0	0	20	
1,3-Dichlorobenzene	BRL	1.0						0.9100	0	20	
1,4-Dichlorobenzene	BRL	1.0						0	0	20	
2-Butanone	BRL	10						0	0	20	
2-Hexanone	BRL	10						0	0	20	
4-Methyl-2-pentanone	BRL	10						0	0	20	
Acetone	BRL	20						0	0	20	
Benzene	BRL	1.0						0	0	20	
Bromodichloromethane	BRL	1.0						0	0	20	
Bromoform	BRL	1.0						0	0	20	
Bromomethane	BRL	1.0						0	0	20	
Carbon disulfide	BRL	5.0						0	0	20	
Carbon tetrachloride	BRL	2.0						0	0	20	
Chlorobenzene	BRL	1.0						0	0	20	
Chloroethane	BRL	1.0						0	0	20	
Chloroform	BRL	1.0						0	0	20	
Chloromethane	BRL	1.0						0	0	20	
cis-1,2-Dichloroethene	BRL	1.0						0	0	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1901D90

ANALYTICAL QC SUMMARY REPORT

BatchID: 273115

Sample ID: **1901B17-002ADUP** Client ID: Units: **ug/L** Prep Date: **01/16/2019** Run No: **389136**
SampleType: **DUP** TestCode: **Volatile Organic Compounds by GC/MS SW8260B** BatchID: **273115** Analysis Date: **01/17/2019** Seq No: **8704168**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,3-Dichloropropene	BRL	1.0						0	0	20	
Cyclohexane	BRL	2.0						0	0	20	
Dibromochloromethane	BRL	1.0						0	0	20	
Dichlorodifluoromethane	BRL	1.0						0	0	20	
Ethylbenzene	BRL	1.0						0	0	20	
Freon-113	BRL	5.0						0	0	20	
Isopropylbenzene	BRL	1.0						0	0	20	
Methyl acetate	BRL	2.0						0	0	20	
Methyl tert-butyl ether	BRL	1.0						0	0	20	
Methylcyclohexane	BRL	2.0						0	0	20	
Methylene chloride	BRL	5.0						0	0	20	
Styrene	BRL	1.0						0	0	20	
Tetrachloroethene	BRL	1.0						0	0	20	
Toluene	BRL	1.0						0	0	20	
trans-1,2-Dichloroethene	BRL	2.0						0	0	20	
trans-1,3-Dichloropropene	BRL	2.0						0	0	20	
Trichloroethene	BRL	1.0						0	0	20	
Trichlorofluoromethane	BRL	1.0						0	0	20	
Vinyl chloride	BRL	1.0						0	0	20	
Xylenes, Total	BRL	1.0						0	0	20	
Surr: 4-Bromofluorobenzene	44.65	0						46.28	0	0	
Surr: Dibromofluoromethane	50.22	0						51.83	0	0	
Surr: Toluene-d8	48.80	0						48.05	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

May 01, 2019

Terefe Mazengia
GHD Services, Inc.

3075 Breckenridge Blvd., Suite 470
Duluth GA 30096

RE: Bluewater Thermal Solutions

Dear Terefe Mazengia: Order No: 1904R69

Analytical Environmental Services, Inc. received 7 samples on 4/25/2019 4:00:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative. AES' certifications are as follows:
-South Carolina Certification number 98016003 for Clean Water Act and for Solid and Hazardous Waste, effective until 6/30/19.

These results relate only to the items tested as received. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Chris Pafford

Project Manager

3080 Presidential Drive • Atlanta, Georgia 30340 • Tel: 770.457.8177 • Fax: 770.457.8188 • Toll Free: 800.972.4889
www.aesatlanta.com

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 Presidential Drive Atlanta, GA 30340-3704
Phone: (770) 457-8177 / Toll-Free: (800) 972-4889 / Fax: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1904R69

Date: 4/25/19 Page 1 of 1

COMPANY:	ADDRESS:
GHD	3075 Breckinridge Blvd. Ste 470 Duluth, GA 30096
PHONE: 770-441-0027	EMAIL: steven.grace@ghd.com
SAMPLED BY: Steven Grace	SIGNATURE:

#	SAMPLE ID	SAMPLED: DATE	SAMPLED: TIME	GRAB	COMPOSITE	MATRIX (see codes)	VOCs	REMARKS	Number of Containers
1	GW-077150-042519-SAG-001	4/25/19	945	X		GW	X		2
2	GW-077150-042519-SAG-002	↓	1040	X		↓	X		2
3	GW-077150-042519-SAG-003		1130	X			X		2
4	GW-077150-042519-SAG-004		1135	X			X		2
5	GW-077150-042519-SAG-005		1225	X			X		2
6	GW-077150-042519-SAG-006	↓	1325	X		↓	X		2
7	Trip Blank						X		2
8									
9									
10									
11									
12									
13									
14									

ANALYSIS REQUESTED

PRESERVATION (see codes)

Visit our website www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
1.	4/25/19 1600	1.	4-25-19 1600
2.		2.	4.1°C
3.		3.	

SPECIAL INSTRUCTIONS/COMMENTS:

SHIPMENT METHOD

OUT: / / VIA:

IN: / / VIA:

(client) FedEx UPS US mail courier

other: _____

PROJECT INFORMATION

PROJECT NAME: Bluewater

PROJECT #: 077150

SITE ADDRESS: Fountain Inn, SC

SEND REPORT TO: See SOW

INVOICE TO (IF DIFFERENT FROM ABOVE): See SOW

QUOTE #: _____ PO#: _____

RECEIPT

Total # of Containers: 14

Turnaround Time (TAT) Request

- [x] Standard
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same-Day Rush **(auth req.)**
- [ ] Other _____

STATE PROGRAM (if any): _____

E-mail? ☐ Fax? ☐

DATA PACKAGE: I ○ II ○ III ○ IV ○

Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Client assumes sole responsibility for damage or loss of samples before we accept them. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT. Samples are disposed of 30 days after completion of report unless other arrangements are made.

Matrix Codes: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water ST=Stormwater WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

Preservative Codes: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

7.11.18_CO

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-042519-SAG-001
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019 9:45:00 AM
Lab ID:	1904R69-001	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 13:09	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 13:09	NP
1,1,2-Trichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 13:09	NP
1,1-Dichloroethane	8.7		0.43	1.0	ug/L	278304	1	04/29/2019 13:09	NP
1,1-Dichloroethene	34		0.40	1.0	ug/L	278304	1	04/29/2019 13:09	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 13:09	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	278304	1	04/29/2019 13:09	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	278304	1	04/29/2019 13:09	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 13:09	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 13:09	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	278304	1	04/29/2019 13:09	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 13:09	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	278304	1	04/29/2019 13:09	NP
2-Butanone	BRL		2.5	5.0	ug/L	278304	1	04/29/2019 13:09	NP
2-Hexanone	BRL		0.67	5.0	ug/L	278304	1	04/29/2019 13:09	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	278304	1	04/29/2019 13:09	NP
Acetone	BRL		3.6	5.0	ug/L	278304	1	04/29/2019 13:09	NP
Benzene	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Bromoform	BRL		0.19	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Bromomethane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Carbon disulfide	BRL		0.74	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Chloroethane	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Chloroform	BRL		0.20	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Chloromethane	BRL		0.21	1.0	ug/L	278304	1	04/29/2019 13:09	NP
cis-1,2-Dichloroethene	BRL		0.28	1.0	ug/L	278304	1	04/29/2019 13:09	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Cyclohexane	BRL		1.0	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Freon-113	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Methyl acetate	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Methylene chloride	BRL		1.2	2.0	ug/L	278304	1	04/29/2019 13:09	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-042519-SAG-001
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019 9:45:00 AM
Lab ID:	1904R69-001	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Tetrachloroethene	BRL		0.46	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Toluene	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 13:09	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 13:09	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Trichloroethene	1.0		0.30	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	278304	1	04/29/2019 13:09	NP
Surr: 4-Bromofluorobenzene	91.5		0	70-130	%REC	278304	1	04/29/2019 13:09	NP
Surr: Dibromofluoromethane	116		0	70-130	%REC	278304	1	04/29/2019 13:09	NP
Surr: Toluene-d8	103		0	70-130	%REC	278304	1	04/29/2019 13:09	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-042519-SAG-002
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019 10:40:00 AM
Lab ID:	1904R69-002	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	2.7		0.39	1.0	ug/L	278304	1	04/29/2019 14:00	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 14:00	NP
1,1,2-Trichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 14:00	NP
1,1-Dichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 14:00	NP
1,1-Dichloroethene	BRL		0.40	1.0	ug/L	278304	1	04/29/2019 14:00	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 14:00	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	278304	1	04/29/2019 14:00	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	278304	1	04/29/2019 14:00	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 14:00	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 14:00	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	278304	1	04/29/2019 14:00	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 14:00	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	278304	1	04/29/2019 14:00	NP
2-Butanone	BRL		2.5	5.0	ug/L	278304	1	04/29/2019 14:00	NP
2-Hexanone	BRL		0.67	5.0	ug/L	278304	1	04/29/2019 14:00	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	278304	1	04/29/2019 14:00	NP
Acetone	4.0	J	3.6	5.0	ug/L	278304	1	04/29/2019 14:00	NP
Benzene	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Bromoform	BRL		0.19	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Bromomethane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Carbon disulfide	BRL		0.74	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Chloroethane	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Chloroform	0.83	J	0.20	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Chloromethane	BRL		0.21	1.0	ug/L	278304	1	04/29/2019 14:00	NP
cis-1,2-Dichloroethene	2.8		0.28	1.0	ug/L	278304	1	04/29/2019 14:00	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Cyclohexane	BRL		1.0	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Freon-113	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Methyl acetate	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Methylene chloride	BRL		1.2	2.0	ug/L	278304	1	04/29/2019 14:00	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-042519-SAG-002
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019 10:40:00 AM
Lab ID:	1904R69-002	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Tetrachloroethene	960		4.6	10	ug/L	278304	10	04/29/2019 16:25	NP
Toluene	33		0.39	1.0	ug/L	278304	1	04/29/2019 14:00	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 14:00	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Trichloroethene	24		0.30	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	278304	1	04/29/2019 14:00	NP
Surr: 4-Bromofluorobenzene	90		0	70-130	%REC	278304	1	04/29/2019 14:00	NP
Surr: 4-Bromofluorobenzene	89		0	70-130	%REC	278304	10	04/29/2019 16:25	NP
Surr: Dibromofluoromethane	111		0	70-130	%REC	278304	10	04/29/2019 16:25	NP
Surr: Dibromofluoromethane	114		0	70-130	%REC	278304	1	04/29/2019 14:00	NP
Surr: Toluene-d8	103		0	70-130	%REC	278304	10	04/29/2019 16:25	NP
Surr: Toluene-d8	105		0	70-130	%REC	278304	1	04/29/2019 14:00	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-042519-SAG-003
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019 11:30:00 AM
Lab ID:	1904R69-003	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 14:23	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 14:23	NP
1,1,2-Trichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 14:23	NP
1,1-Dichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 14:23	NP
1,1-Dichloroethene	BRL		0.40	1.0	ug/L	278304	1	04/29/2019 14:23	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 14:23	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	278304	1	04/29/2019 14:23	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	278304	1	04/29/2019 14:23	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 14:23	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 14:23	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	278304	1	04/29/2019 14:23	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 14:23	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	278304	1	04/29/2019 14:23	NP
2-Butanone	BRL		2.5	5.0	ug/L	278304	1	04/29/2019 14:23	NP
2-Hexanone	BRL		0.67	5.0	ug/L	278304	1	04/29/2019 14:23	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	278304	1	04/29/2019 14:23	NP
Acetone	5.1		3.6	5.0	ug/L	278304	1	04/29/2019 14:23	NP
Benzene	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Bromoform	BRL		0.19	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Bromomethane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Carbon disulfide	BRL		0.74	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Chloroethane	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Chloroform	0.64	J	0.20	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Chloromethane	BRL		0.21	1.0	ug/L	278304	1	04/29/2019 14:23	NP
cis-1,2-Dichloroethene	2.5		0.28	1.0	ug/L	278304	1	04/29/2019 14:23	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Cyclohexane	BRL		1.0	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Freon-113	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Methyl acetate	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Methylene chloride	BRL		1.2	2.0	ug/L	278304	1	04/29/2019 14:23	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-042519-SAG-003
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019 11:30:00 AM
Lab ID:	1904R69-003	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Tetrachloroethene	910		4.6	10	ug/L	278304	10	04/29/2019 16:50	NP
Toluene	1.8		0.39	1.0	ug/L	278304	1	04/29/2019 14:23	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 14:23	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Trichloroethene	19		0.30	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	278304	1	04/29/2019 14:23	NP
Surr: 4-Bromofluorobenzene	88.9		0	70-130	%REC	278304	1	04/29/2019 14:23	NP
Surr: 4-Bromofluorobenzene	89.2		0	70-130	%REC	278304	10	04/29/2019 16:50	NP
Surr: Dibromofluoromethane	113		0	70-130	%REC	278304	1	04/29/2019 14:23	NP
Surr: Dibromofluoromethane	114		0	70-130	%REC	278304	10	04/29/2019 16:50	NP
Surr: Toluene-d8	104		0	70-130	%REC	278304	1	04/29/2019 14:23	NP
Surr: Toluene-d8	105		0	70-130	%REC	278304	10	04/29/2019 16:50	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-042519-SAG-004
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019 11:35:00 AM
Lab ID:	1904R69-004	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 14:48	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 14:48	NP
1,1,2-Trichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 14:48	NP
1,1-Dichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 14:48	NP
1,1-Dichloroethene	BRL		0.40	1.0	ug/L	278304	1	04/29/2019 14:48	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 14:48	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	278304	1	04/29/2019 14:48	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	278304	1	04/29/2019 14:48	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 14:48	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 14:48	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	278304	1	04/29/2019 14:48	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 14:48	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	278304	1	04/29/2019 14:48	NP
2-Butanone	BRL		2.5	5.0	ug/L	278304	1	04/29/2019 14:48	NP
2-Hexanone	BRL		0.67	5.0	ug/L	278304	1	04/29/2019 14:48	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	278304	1	04/29/2019 14:48	NP
Acetone	BRL		3.6	5.0	ug/L	278304	1	04/29/2019 14:48	NP
Benzene	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Bromoform	BRL		0.19	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Bromomethane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Carbon disulfide	BRL		0.74	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Chloroethane	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Chloroform	0.77	J	0.20	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Chloromethane	BRL		0.21	1.0	ug/L	278304	1	04/29/2019 14:48	NP
cis-1,2-Dichloroethene	2.5		0.28	1.0	ug/L	278304	1	04/29/2019 14:48	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Cyclohexane	BRL		1.0	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Freon-113	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Methyl acetate	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Methylene chloride	BRL		1.2	2.0	ug/L	278304	1	04/29/2019 14:48	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-042519-SAG-004
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019 11:35:00 AM
Lab ID:	1904R69-004	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Tetrachloroethene	910		4.6	10	ug/L	278304	10	04/29/2019 17:14	NP
Toluene	1.8		0.39	1.0	ug/L	278304	1	04/29/2019 14:48	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 14:48	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Trichloroethene	19		0.30	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	278304	1	04/29/2019 14:48	NP
Surr: 4-Bromofluorobenzene	89.5		0	70-130	%REC	278304	1	04/29/2019 14:48	NP
Surr: 4-Bromofluorobenzene	88.6		0	70-130	%REC	278304	10	04/29/2019 17:14	NP
Surr: Dibromofluoromethane	113		0	70-130	%REC	278304	1	04/29/2019 14:48	NP
Surr: Dibromofluoromethane	115		0	70-130	%REC	278304	10	04/29/2019 17:14	NP
Surr: Toluene-d8	106		0	70-130	%REC	278304	1	04/29/2019 14:48	NP
Surr: Toluene-d8	106		0	70-130	%REC	278304	10	04/29/2019 17:14	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-042519-SAG-005
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019 12:25:00 PM
Lab ID:	1904R69-005	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 15:12	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 15:12	NP
1,1,2-Trichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 15:12	NP
1,1-Dichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 15:12	NP
1,1-Dichloroethene	BRL		0.40	1.0	ug/L	278304	1	04/29/2019 15:12	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 15:12	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	278304	1	04/29/2019 15:12	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	278304	1	04/29/2019 15:12	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 15:12	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 15:12	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	278304	1	04/29/2019 15:12	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 15:12	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	278304	1	04/29/2019 15:12	NP
2-Butanone	BRL		2.5	5.0	ug/L	278304	1	04/29/2019 15:12	NP
2-Hexanone	BRL		0.67	5.0	ug/L	278304	1	04/29/2019 15:12	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	278304	1	04/29/2019 15:12	NP
Acetone	41		3.6	5.0	ug/L	278304	1	04/29/2019 15:12	NP
Benzene	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Bromoform	BRL		0.19	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Bromomethane	6.4		0.39	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Carbon disulfide	2.3		0.74	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Chloroethane	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Chloroform	1.0		0.20	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Chloromethane	3.8		0.21	1.0	ug/L	278304	1	04/29/2019 15:12	NP
cis-1,2-Dichloroethene	BRL		0.28	1.0	ug/L	278304	1	04/29/2019 15:12	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Cyclohexane	BRL		1.0	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Freon-113	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Methyl acetate	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Methylene chloride	BRL		1.2	2.0	ug/L	278304	1	04/29/2019 15:12	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-042519-SAG-005
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019 12:25:00 PM
Lab ID:	1904R69-005	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Tetrachloroethene	480		4.6	10	ug/L	278304	10	04/29/2019 17:38	NP
Toluene	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 15:12	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 15:12	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Trichloroethene	1.8		0.30	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	278304	1	04/29/2019 15:12	NP
Surr: 4-Bromofluorobenzene	88.9		0	70-130	%REC	278304	1	04/29/2019 15:12	NP
Surr: 4-Bromofluorobenzene	90.9		0	70-130	%REC	278304	10	04/29/2019 17:38	NP
Surr: Dibromofluoromethane	114		0	70-130	%REC	278304	1	04/29/2019 15:12	NP
Surr: Dibromofluoromethane	115		0	70-130	%REC	278304	10	04/29/2019 17:38	NP
Surr: Toluene-d8	102		0	70-130	%REC	278304	1	04/29/2019 15:12	NP
Surr: Toluene-d8	106		0	70-130	%REC	278304	10	04/29/2019 17:38	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-042519-SAG-006
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019 1:25:00 PM
Lab ID:	1904R69-006	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 13:33	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 13:33	NP
1,1,2-Trichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 13:33	NP
1,1-Dichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 13:33	NP
1,1-Dichloroethene	BRL		0.40	1.0	ug/L	278304	1	04/29/2019 13:33	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 13:33	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	278304	1	04/29/2019 13:33	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	278304	1	04/29/2019 13:33	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 13:33	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 13:33	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	278304	1	04/29/2019 13:33	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 13:33	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	278304	1	04/29/2019 13:33	NP
2-Butanone	BRL		2.5	5.0	ug/L	278304	1	04/29/2019 13:33	NP
2-Hexanone	BRL		0.67	5.0	ug/L	278304	1	04/29/2019 13:33	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	278304	1	04/29/2019 13:33	NP
Acetone	46		3.6	5.0	ug/L	278304	1	04/29/2019 13:33	NP
Benzene	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Bromoform	BRL		0.19	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Bromomethane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Carbon disulfide	BRL		0.74	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Chloroethane	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Chloroform	BRL		0.20	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Chloromethane	BRL		0.21	1.0	ug/L	278304	1	04/29/2019 13:33	NP
cis-1,2-Dichloroethene	BRL		0.28	1.0	ug/L	278304	1	04/29/2019 13:33	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Cyclohexane	BRL		1.0	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Freon-113	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Methyl acetate	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Methylene chloride	BRL		1.2	2.0	ug/L	278304	1	04/29/2019 13:33	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-042519-SAG-006
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019 1:25:00 PM
Lab ID:	1904R69-006	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Tetrachloroethene	14		0.46	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Toluene	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 13:33	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 13:33	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Trichloroethene	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	278304	1	04/29/2019 13:33	NP
Surr: 4-Bromofluorobenzene	92.6		0	70-130	%REC	278304	1	04/29/2019 13:33	NP
Surr: Dibromofluoromethane	113		0	70-130	%REC	278304	1	04/29/2019 13:33	NP
Surr: Toluene-d8	104		0	70-130	%REC	278304	1	04/29/2019 13:33	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	TRIP BLANK
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019
Lab ID:	1904R69-007	**Matrix:**	Aqueous

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 12:44	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 12:44	NP
1,1,2-Trichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 12:44	NP
1,1-Dichloroethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 12:44	NP
1,1-Dichloroethene	BRL		0.40	1.0	ug/L	278304	1	04/29/2019 12:44	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 12:44	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	278304	1	04/29/2019 12:44	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	278304	1	04/29/2019 12:44	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 12:44	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 12:44	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	278304	1	04/29/2019 12:44	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 12:44	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	278304	1	04/29/2019 12:44	NP
2-Butanone	BRL		2.5	5.0	ug/L	278304	1	04/29/2019 12:44	NP
2-Hexanone	BRL		0.67	5.0	ug/L	278304	1	04/29/2019 12:44	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	278304	1	04/29/2019 12:44	NP
Acetone	BRL		3.6	5.0	ug/L	278304	1	04/29/2019 12:44	NP
Benzene	BRL		0.37	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Bromoform	BRL		0.19	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Bromomethane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Carbon disulfide	BRL		0.74	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Chlorobenzene	0.42	J	0.42	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Chloroethane	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Chloroform	BRL		0.20	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Chloromethane	BRL		0.21	1.0	ug/L	278304	1	04/29/2019 12:44	NP
cis-1,2-Dichloroethene	BRL		0.28	1.0	ug/L	278304	1	04/29/2019 12:44	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Cyclohexane	BRL		1.0	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Freon-113	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Methyl acetate	BRL		0.42	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Methylene chloride	3.0		1.2	2.0	ug/L	278304	1	04/29/2019 12:44	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 1-May-19

Client:	GHD Services, Inc.	**Client Sample ID:**	TRIP BLANK
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	4/25/2019
Lab ID:	1904R69-007	**Matrix:**	Aqueous

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Tetrachloroethene	BRL		0.46	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Toluene	BRL		0.39	1.0	ug/L	278304	1	04/29/2019 12:44	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 12:44	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Trichloroethene	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	278304	1	04/29/2019 12:44	NP
Surr: 4-Bromofluorobenzene	89.5		0	70-130	%REC	278304	1	04/29/2019 12:44	NP
Surr: Dibromofluoromethane	112		0	70-130	%REC	278304	1	04/29/2019 12:44	NP
Surr: Toluene-d8	102		0	70-130	%REC	278304	1	04/29/2019 12:44	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

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ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **GHD Services, Inc.** AES Work Order Number: **1904R69**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	●	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	●	○		
5.	Custody seals intact on shipping container?	○	○	●		
6.	Temperature blanks present?	○	●	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	●	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	●	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	●	○	○		
10.	Sampler name and/or signature on COC?	●	○	○		
11.	Were all samples received within holding time?	●	○	○		
12.	TAT marked on the COC?	●	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 4.1 °C Cooler 2 Temperature _____ °C Cooler 3 Temperature _____ °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). AP 4/25/19

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	●	○	○		
17.	Custody seals present on sample containers?	○	●	○		
18.	Custody seals intact on sample containers?	○	○	●		
19.	Do sample container labels match the COC?	●	○	○	incomplete info ☐ illegible ☐ no label ☐ other ☐	
20.	Are analyses requested indicated on the COC?	●	○	○		
21.	Were all of the samples listed on the COC received?	●	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	●	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	●	○	○		
24.	Were samples received in appropriate containers?	●	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	●	○	○		
26.	Were trip blanks submitted?	●	○	○	listed on COC ■ not listed on COC ☐	

27. Comments: _____

I certify that I have completed sections 16-27 (dated initials). HB 4/25/19

This section only applies to samples where pH can be checked at Sample Receipt.

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	●		
29.	Containers meet preservation guidelines?	○	○	●		
30.	Was pH adjusted at Sample Receipt?	○	○	●		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). HB 4/25/19

Locked

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1904R69

ANALYTICAL QC SUMMARY REPORT

BatchID: 278304

Sample ID: **MB-278304** Client ID: Units: **ug/L** Prep Date: **04/27/2019** Run No: **396909**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **278304** Analysis Date: **04/27/2019** Seq No: **8890398**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	BRL	1.0									
1,1,1-Trichloroethane	BRL	1.0									
1,1,2-Trichloroethane	BRL	1.0									
1,1-Dichloroethane	BRL	1.0									
1,1-Dichloroethene	BRL	2.0									
1,2,4-Trichlorobenzene	BRL	1.0									
1,2-Dibromo-3-chloropropane	BRL	1.0									
1,2-Dibromoethane	BRL	1.0									
1,2-Dichlorobenzene	BRL	1.0									
1,2-Dichloroethane	BRL	1.0									
1,2-Dichloropropane	BRL	1.0									
1,3-Dichlorobenzene	BRL	1.0									
1,4-Dichlorobenzene	BRL	1.0									
2-Butanone	BRL	10									
2-Hexanone	BRL	10									
4-Methyl-2-pentanone	BRL	10									
Acetone	BRL	20									
Benzene	BRL	1.0									
Bromodichloromethane	BRL	1.0									
Bromoform	BRL	1.0									
Bromomethane	BRL	1.0									
Carbon disulfide	BRL	5.0									
Carbon tetrachloride	BRL	2.0									
Chlorobenzene	BRL	1.0									
Chloroethane	BRL	1.0									
Chloroform	BRL	1.0									
Chloromethane	BRL	1.0									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1904R69

ANALYTICAL QC SUMMARY REPORT

BatchID: 278304

Sample ID: **MB-278304** Client ID: Units: **ug/L** Prep Date: **04/27/2019** Run No: **396909**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **278304** Analysis Date: **04/27/2019** Seq No: **8890398**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	BRL	1.0									
cis-1,3-Dichloropropene	BRL	1.0									
Cyclohexane	BRL	2.0									
Dibromochloromethane	BRL	1.0									
Dichlorodifluoromethane	BRL	1.0									
Ethylbenzene	BRL	1.0									
Freon-113	BRL	5.0									
Isopropylbenzene	BRL	1.0									
Methyl acetate	BRL	2.0									
Methyl tert-butyl ether	BRL	1.0									
Methylcyclohexane	BRL	2.0									
Methylene chloride	BRL	5.0									
Styrene	BRL	1.0									
Tetrachloroethene	BRL	1.0									
Toluene	BRL	1.0									
trans-1,2-Dichloroethene	BRL	2.0									
trans-1,3-Dichloropropene	BRL	2.0									
Trichloroethene	BRL	1.0									
Trichlorofluoromethane	BRL	1.0									
Vinyl chloride	BRL	1.0									
Xylenes, Total	BRL	1.0									
Surr: 4-Bromofluorobenzene	45.54	0	50.00		91.1	70	130				
Surr: Dibromofluoromethane	56.94	0	50.00		114	70	130				
Surr: Toluene-d8	52.38	0	50.00		105	70	130				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1904R69

ANALYTICAL QC SUMMARY REPORT

BatchID: 278304

Sample ID: **LCS-278304** Client ID: Units: **ug/L** Prep Date: **04/27/2019** Run No: **396909**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **278304** Analysis Date: **04/27/2019** Seq No: **8890397**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	59.38	1.0	50.00		119	70	130				
1,1,1-Trichloroethane	52.10	1.0	50.00		104	70	130				
1,1,2-Trichloroethane	54.69	1.0	50.00		109	70	130				
1,1-Dichloroethane	51.28	1.0	50.00		103	70	130				
1,1-Dichloroethene	55.30	2.0	50.00		111	60	140				
1,2,4-Trichlorobenzene	45.65	1.0	50.00		91.3	70	130				
1,2-Dibromo-3-chloropropane	53.50	1.0	50.00		107	70	130				
1,2-Dibromoethane	54.78	1.0	50.00		110	70	130				
1,2-Dichlorobenzene	53.57	1.0	50.00		107	70	130				
1,2-Dichloroethane	50.68	1.0	50.00		101	70	130				
1,2-Dichloropropane	54.98	1.0	50.00		110	70	130				
1,3-Dichlorobenzene	54.21	1.0	50.00		108	70	130				
1,4-Dichlorobenzene	55.86	1.0	50.00		112	70	130				
Benzene	54.26	1.0	50.00		109	70	130				
Bromodichloromethane	54.58	1.0	50.00		109	70	130				
Bromoform	52.73	1.0	50.00		105	70	130				
Carbon tetrachloride	60.85	2.0	50.00		122	70	130				
Chlorobenzene	55.47	1.0	50.00		111	70	130				
Chloroform	51.75	1.0	50.00		104	70	130				
cis-1,2-Dichloroethene	54.30	1.0	50.00		109	70	130				
cis-1,3-Dichloropropene	51.46	1.0	50.00		103	70	130				
Dibromochloromethane	51.63	1.0	50.00		103	70	130				
Ethylbenzene	51.51	1.0	50.00		103	70	130				
Isopropylbenzene	48.13	1.0	50.00		96.3	70	130				
Methylene chloride	55.55	5.0	50.00		111	70	130				
Styrene	56.64	1.0	50.00		113	70	130				
Tetrachloroethene	51.68	1.0	50.00		103	70	130				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1904R69

ANALYTICAL QC SUMMARY REPORT

BatchID: 278304

Sample ID: **LCS-278304** Client ID: Units: **ug/L** Prep Date: **04/27/2019** Run No: **396909**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **278304** Analysis Date: **04/27/2019** Seq No: **8890397**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Toluene	53.69	1.0	50.00		107	70	130				
trans-1,2-Dichloroethene	57.18	2.0	50.00		114	70	130				
trans-1,3-Dichloropropene	54.93	2.0	50.00		110	70	130				
Trichloroethene	51.77	1.0	50.00		104	70	130				
Vinyl chloride	55.20	1.0	50.00		110	70	130				
Xylenes, Total	154.9	1.0	150.0		103	70	130				
Surr: 4-Bromofluorobenzene	49.52	0	50.00		99.0	70	130				
Surr: Dibromofluoromethane	57.37	0	50.00		115	70	130				
Surr: Toluene-d8	54.26	0	50.00		109	70	130				

Sample ID: **1904Q50-002AMS** Client ID: Units: **ug/L** Prep Date: **04/27/2019** Run No: **396909**
SampleType: **MS** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **278304** Analysis Date: **04/27/2019** Seq No: **8890400**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	60.12	1.0	50.00		120	70	139				
1,1,1-Trichloroethane	52.63	1.0	50.00		105	66.7	137				
1,1,2-Trichloroethane	60.60	1.0	50.00		121	71.8	130				
1,1-Dichloroethane	54.25	1.0	50.00		108	63.7	134				
1,1-Dichloroethene	58.05	2.0	50.00		116	63.8	146				
1,2,4-Trichlorobenzene	39.04	1.0	50.00		78.1	57.1	144				
1,2-Dibromo-3-chloropropane	57.26	1.0	50.00		115	56.7	133				
1,2-Dibromoethane	57.38	1.0	50.00		115	69.5	133				
1,2-Dichlorobenzene	53.28	1.0	50.00		107	68.3	135				
1,2-Dichloroethane	53.93	1.0	50.00		108	67	136				
1,2-Dichloropropane	56.31	1.0	50.00		113	70.8	130				
1,3-Dichlorobenzene	53.24	1.0	50.00		106	65.8	136				
1,4-Dichlorobenzene	54.31	1.0	50.00		109	69.2	133				
Benzene	55.85	1.0	50.00		112	70.2	137				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1904R69

ANALYTICAL QC SUMMARY REPORT

BatchID: 278304

Sample ID: **1904Q50-002AMS** Client ID: Units: **ug/L** Prep Date: **04/27/2019** Run No: **396909**
SampleType: **MS** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **278304** Analysis Date: **04/27/2019** Seq No: **8890400**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Bromodichloromethane	56.45	1.0	50.00		113	62	137				
Bromoform	56.88	1.0	50.00		114	59.7	136				
Carbon tetrachloride	59.14	2.0	50.00		118	67.7	146				
Chlorobenzene	56.05	1.0	50.00		112	72.7	141				
Chloroform	53.87	1.0	50.00		108	65.6	134				
cis-1,2-Dichloroethene	56.85	1.0	50.00		114	65.9	136				
cis-1,3-Dichloropropene	47.56	1.0	50.00		95.1	61.7	127				
Dibromochloromethane	50.89	1.0	50.00		102	60.4	135				
Ethylbenzene	51.38	1.0	50.00		103	73	135				
Isopropylbenzene	47.17	1.0	50.00		94.3	65.9	137				
Methylene chloride	56.02	5.0	50.00		112	64.1	133				
Styrene	55.70	1.0	50.00		111	71.2	137				
Tetrachloroethene	49.47	1.0	50.00		98.9	67.6	146				
Toluene	54.03	1.0	50.00		108	67	141				
trans-1,2-Dichloroethene	60.64	2.0	50.00		121	64	139				
trans-1,3-Dichloropropene	53.22	2.0	50.00		106	60.3	117				
Trichloroethene	53.02	1.0	50.00		106	69.3	141				
Vinyl chloride	53.15	1.0	50.00		106	63.2	148				
Xylenes, Total	154.0	1.0	150.0		103	77.9	138				
Surr: 4-Bromofluorobenzene	51.16	0	50.00		102	70	130				
Surr: Dibromofluoromethane	58.38	0	50.00		117	70	130				
Surr: Toluene-d8	54.92	0	50.00		110	70	130				

Sample ID: **1904Q50-002AMSD** Client ID: Units: **ug/L** Prep Date: **04/27/2019** Run No: **396909**
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **278304** Analysis Date: **04/27/2019** Seq No: **8890401**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	61.32	1.0	50.00		123	70	139	60.12	1.98	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1904R69

ANALYTICAL QC SUMMARY REPORT

BatchID: 278304

Sample ID: **1904Q50-002AMSD** Client ID: Units: **ug/L** Prep Date: **04/27/2019** Run No: **396909**
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **278304** Analysis Date: **04/27/2019** Seq No: **8890401**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	52.77	1.0	50.00		106	66.7	137	52.63	0.266	20	
1,1,2-Trichloroethane	57.24	1.0	50.00		114	71.8	130	60.60	5.70	20	
1,1-Dichloroethane	51.90	1.0	50.00		104	63.7	134	54.25	4.43	20	
1,1-Dichloroethene	56.51	2.0	50.00		113	63.8	146	58.05	2.69	20.8	
1,2,4-Trichlorobenzene	40.63	1.0	50.00		81.3	57.1	144	39.04	3.99	28.1	
1,2-Dibromo-3-chloropropane	61.28	1.0	50.00		123	56.7	133	57.26	6.78	25.3	
1,2-Dibromoethane	58.69	1.0	50.00		117	69.5	133	57.38	2.26	20	
1,2-Dichlorobenzene	53.06	1.0	50.00		106	68.3	135	53.28	0.414	20	
1,2-Dichloroethane	52.00	1.0	50.00		104	67	136	53.93	3.64	20	
1,2-Dichloropropane	54.16	1.0	50.00		108	70.8	130	56.31	3.89	20	
1,3-Dichlorobenzene	53.25	1.0	50.00		106	65.8	136	53.24	0.019	20	
1,4-Dichlorobenzene	53.76	1.0	50.00		108	69.2	133	54.31	1.02	20	
Benzene	54.14	1.0	50.00		108	70.2	137	55.85	3.11	20	
Bromodichloromethane	53.48	1.0	50.00		107	62	137	56.45	5.40	20	
Bromoform	59.60	1.0	50.00		119	59.7	136	56.88	4.67	20	
Carbon tetrachloride	60.27	2.0	50.00		121	67.7	146	59.14	1.89	19.2	
Chlorobenzene	56.34	1.0	50.00		113	72.7	141	56.05	0.516	20	
Chloroform	51.87	1.0	50.00		104	65.6	134	53.87	3.78	20	
cis-1,2-Dichloroethene	54.59	1.0	50.00		109	65.9	136	56.85	4.06	18	
cis-1,3-Dichloropropene	47.22	1.0	50.00		94.4	61.7	127	47.56	0.717	20	
Dibromochloromethane	51.52	1.0	50.00		103	60.4	135	50.89	1.23	20	
Ethylbenzene	51.91	1.0	50.00		104	73	135	51.38	1.03	20	
Isopropylbenzene	48.20	1.0	50.00		96.4	65.9	137	47.17	2.16	20	
Methylene chloride	54.59	5.0	50.00		109	64.1	133	56.02	2.59	20	
Styrene	54.94	1.0	50.00		110	71.2	137	55.70	1.37	20	
Tetrachloroethene	51.22	1.0	50.00		102	67.6	146	49.47	3.48	20	
Toluene	53.92	1.0	50.00		108	67	141	54.03	0.204	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1904R69

ANALYTICAL QC SUMMARY REPORT

BatchID: 278304

Sample ID: **1904Q50-002AMSD** Client ID:
SampleType: **MSD** TestCode: **Volatile Organic Compounds by GC/MS SW8260D**
Units: **ug/L** Prep Date: **04/27/2019** Run No: **396909**
BatchID: **278304** Analysis Date: **04/27/2019** Seq No: **8890401**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
trans-1,2-Dichloroethene	57.08	2.0	50.00		114	64	139	60.64	6.05	20	
trans-1,3-Dichloropropene	51.79	2.0	50.00		104	60.3	117	53.22	2.72	20	
Trichloroethene	52.50	1.0	50.00		105	69.3	141	53.02	0.986	17.9	
Vinyl chloride	50.62	1.0	50.00		101	63.2	148	53.15	4.88	20	
Xylenes, Total	155.4	1.0	150.0		104	77.9	138	154.0	0.879	20	
Surr: 4-Bromofluorobenzene	49.97	0	50.00		99.9	70	130	51.16	0	0	
Surr: Dibromofluoromethane	56.90	0	50.00		114	70	130	58.38	0	0	
Surr: Toluene-d8	53.17	0	50.00		106	70	130	54.92	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

August 02, 2019

Terefe Mazengia
GHD Services, Inc.

3075 Breckenridge Blvd., Suite 470
Duluth GA 30096

RE: Bluewater Thermal Solutions

Dear Terefe Mazengia: Order No: 1907P25

Analytical Environmental Services, Inc. received 7 samples on 7/26/2019 3:20:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative. AES' certifications are as follows:
-South Carolina Certification number 98016003 for Clean Water Act and for Solid and Hazardous Waste, effective until 6/30/20.

These results relate only to the items tested as received. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Chris Pafford

Project Manager

3080 Presidential Drive • Atlanta, Georgia 30340 • Tel: 770.457.8177 • Fax: 770.457.8188 • Toll Free: 800.972.4889
www.aesatlanta.com

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
3080 Presidential Drive Atlanta, GA 30340-3704
Phone: (770) 457-8177 / Toll-Free: (800) 972-4889 / Fax: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1907P25

Date: 7/26/19 Page 1 of 1

COMPANY: GHD	ADDRESS: 3075 Breckinridge Blvd. Ste 470 Duluth, GA 30096
PHONE: 770-441-0021	EMAIL: steven.grau@ghd.com
SAMPLED BY: Steven Grau	SIGNATURE:

#	SAMPLE ID	SAMPLED: DATE	SAMPLED: TIME	GRAB	COMPOSITE	MATRIX (see codes)	ANALYSIS REQUESTED: VOCs	PRESERVATION (see codes)	REMARKS	Number of Containers
1	GW-077150-072619-SAG-001	7/26/19	845	X		GW	X			2
2	GW-077150-072619-SAG-002		940	X			X			2
3	GW-077150-072619-SAG-003		1050	X			X			2
4	GW-077150-072619-SAG-004		1055	X			X			2
5	GW-077150-072619-SAG-005		1155	X			X			2
6	GW-077150-072619-SAG-006		1255	X			X			2
7	Trip Blank						X			2
8										
9										
10										
11										
12										
13										
14										

Visit our website www.aesatlanta.com for downloadable COCs and to log in to your AESAccess account.

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
1.	7/26/19 1520	1.	7-26-19 1520
2.		2.	1.0°C
3.		3.	

SPECIAL INSTRUCTIONS/COMMENTS: See SOW #077150-003

SHIPMENT METHOD
OUT: / / VIA:
IN: / / VIA:
client FedEx UPS US mail courier
other: _____

PROJECT INFORMATION
PROJECT NAME: Bluewater
PROJECT #: 077150
SITE ADDRESS: Fountain Inn, SC
SEND REPORT TO: See SOW
INVOICE TO (IF DIFFERENT FROM ABOVE): See SOW
QUOTE #: _____ PO#: _____

RECEIPT
Total # of Containers: 14

Turnaround Time (TAT) Request
- [X] Standard
- [ ] 2 Business Day Rush
- [ ] Next Business Day Rush
- [ ] Same-Day Rush (auth req.)
- [ ] Other _____

STATE PROGRAM (if any): _____
E-mail? ☐ Fax? ☐
DATA PACKAGE: I ○ II ○ III ○ IV ○

Submission of samples to the laboratory constitutes acceptance of AES's Terms & Conditions. Client assumes sole responsibility for damage or loss of samples before we accept them. Samples received after 3PM or on Saturday are considered as received the following business day. If no TAT is marked on COC, AES will proceed with standard TAT. Samples are disposed of 30 days after completion of report unless other arrangements are made.

Matrix Codes: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water ST=Stormwater WW = Waste Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify)

Preservative Codes: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

2.14.19_CO

White Copy - Original; Yellow Copy - Client

Analytical Environmental Services, Inc

Date: 2-Aug-19

Client: GHD Services, Inc.
Project: Bluewater Thermal Solutions
Lab ID: 1907P25

Case Narrative

Volatile Organic Compounds Analysis by Method 8260D:

Sample 1907P25-003A, -004A and -003AMS exhibited a positive result for the presence of residual chlorine or other oxidizing agent. The presence of free chlorine in aqueous samples can cause the formation of trihalomethanes and other possible chemical reactions.

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-072619-SAG-001
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019 8:45:00 AM
Lab ID:	1907P25-001	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 18:46	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	282883	1	08/01/2019 18:46	NP
1,1,2-Trichloroethane	BRL		0.43	1.0	ug/L	282883	1	08/01/2019 18:46	NP
1,1-Dichloroethane	7.8		0.43	1.0	ug/L	282883	1	08/01/2019 18:46	NP
1,1-Dichloroethene	31		0.40	1.0	ug/L	282883	1	08/01/2019 18:46	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 18:46	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	282883	1	08/01/2019 18:46	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	282883	1	08/01/2019 18:46	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	282883	1	08/01/2019 18:46	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	282883	1	08/01/2019 18:46	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	282883	1	08/01/2019 18:46	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	282883	1	08/01/2019 18:46	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	282883	1	08/01/2019 18:46	NP
2-Butanone	BRL		2.5	5.0	ug/L	282883	1	08/01/2019 18:46	NP
2-Hexanone	BRL		0.67	5.0	ug/L	282883	1	08/01/2019 18:46	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	282883	1	08/01/2019 18:46	NP
Acetone	BRL		3.6	5.0	ug/L	282883	1	08/01/2019 18:46	NP
Benzene	BRL		0.37	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Bromoform	BRL		0.19	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Bromomethane	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Carbon disulfide	BRL		0.74	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Chloroethane	BRL		0.31	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Chloroform	0.24	J	0.20	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Chloromethane	BRL		0.21	1.0	ug/L	282883	1	08/01/2019 18:46	NP
cis-1,2-Dichloroethene	BRL		0.28	1.0	ug/L	282883	1	08/01/2019 18:46	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Cyclohexane	BRL		1.0	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Freon-113	BRL		0.32	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Methyl acetate	BRL		0.42	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Methylene chloride	BRL		1.2	2.0	ug/L	282883	1	08/01/2019 18:46	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-072619-SAG-001
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019 8:45:00 AM
Lab ID:	1907P25-001	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Tetrachloroethene	BRL		0.46	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Toluene	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 18:46	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	282883	1	08/01/2019 18:46	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Trichloroethene	1.0		0.30	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	282883	1	08/01/2019 18:46	NP
Surr: 4-Bromofluorobenzene	90.8		0	70-130	%REC	282883	1	08/01/2019 18:46	NP
Surr: Dibromofluoromethane	100		0	70-130	%REC	282883	1	08/01/2019 18:46	NP
Surr: Toluene-d8	101		0	70-130	%REC	282883	1	08/01/2019 18:46	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-072619-SAG-002
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019 9:40:00 AM
Lab ID:	1907P25-002	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 21:15	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	282883	1	08/01/2019 21:15	NP
1,1,2-Trichloroethane	BRL		0.43	1.0	ug/L	282883	1	08/01/2019 21:15	NP
1,1-Dichloroethane	BRL		0.43	1.0	ug/L	282883	1	08/01/2019 21:15	NP
1,1-Dichloroethene	BRL		0.40	1.0	ug/L	282883	1	08/01/2019 21:15	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 21:15	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	282883	1	08/01/2019 21:15	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	282883	1	08/01/2019 21:15	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	282883	1	08/01/2019 21:15	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	282883	1	08/01/2019 21:15	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	282883	1	08/01/2019 21:15	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	282883	1	08/01/2019 21:15	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	282883	1	08/01/2019 21:15	NP
2-Butanone	BRL		2.5	5.0	ug/L	282883	1	08/01/2019 21:15	NP
2-Hexanone	BRL		0.67	5.0	ug/L	282883	1	08/01/2019 21:15	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	282883	1	08/01/2019 21:15	NP
Acetone	BRL		3.6	5.0	ug/L	282883	1	08/01/2019 21:15	NP
Benzene	BRL		0.37	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Bromoform	BRL		0.19	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Bromomethane	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Carbon disulfide	BRL		0.74	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Chloroethane	BRL		0.31	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Chloroform	BRL		0.20	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Chloromethane	BRL		0.21	1.0	ug/L	282883	1	08/01/2019 21:15	NP
cis-1,2-Dichloroethene	0.44	J	0.28	1.0	ug/L	282883	1	08/01/2019 21:15	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Cyclohexane	BRL		1.0	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Freon-113	BRL		0.32	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Methyl acetate	BRL		0.42	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Methylene chloride	BRL		1.2	2.0	ug/L	282883	1	08/01/2019 21:15	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-072619-SAG-002
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019 9:40:00 AM
Lab ID:	1907P25-002	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Tetrachloroethene	310		4.6	10	ug/L	282883	10	08/01/2019 21:40	NP
Toluene	32		0.39	1.0	ug/L	282883	1	08/01/2019 21:15	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	282883	1	08/01/2019 21:15	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Trichloroethene	5.8		0.30	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	282883	1	08/01/2019 21:15	NP
Surr: 4-Bromofluorobenzene	91.2		0	70-130	%REC	282883	1	08/01/2019 21:15	NP
Surr: 4-Bromofluorobenzene	90.1		0	70-130	%REC	282883	10	08/01/2019 21:40	NP
Surr: Dibromofluoromethane	99.3		0	70-130	%REC	282883	1	08/01/2019 21:15	NP
Surr: Dibromofluoromethane	98.6		0	70-130	%REC	282883	10	08/01/2019 21:40	NP
Surr: Toluene-d8	100		0	70-130	%REC	282883	10	08/01/2019 21:40	NP
Surr: Toluene-d8	101		0	70-130	%REC	282883	1	08/01/2019 21:15	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-072619-SAG-003
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019 10:50:00 AM
Lab ID:	1907P25-003	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 11:47	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 11:47	NP
1,1,2-Trichloroethane	1.2		0.43	1.0	ug/L	282883	1	08/02/2019 11:47	NP
1,1-Dichloroethane	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 11:47	NP
1,1-Dichloroethene	BRL		0.40	1.0	ug/L	282883	1	08/02/2019 11:47	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 11:47	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	282883	1	08/02/2019 11:47	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	282883	1	08/02/2019 11:47	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	282883	1	08/02/2019 11:47	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	282883	1	08/02/2019 11:47	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	282883	1	08/02/2019 11:47	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	282883	1	08/02/2019 11:47	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	282883	1	08/02/2019 11:47	NP
2-Butanone	BRL		2.5	5.0	ug/L	282883	1	08/02/2019 11:47	NP
2-Hexanone	BRL		0.67	5.0	ug/L	282883	1	08/02/2019 11:47	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	282883	1	08/02/2019 11:47	NP
Acetone	23		3.6	5.0	ug/L	282883	1	08/02/2019 11:47	NP
Benzene	BRL		0.37	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Bromoform	2.1		0.19	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Bromomethane	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Carbon disulfide	2.0		0.74	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Chloroethane	BRL		0.31	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Chloroform	1.2		0.20	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Chloromethane	1.5		0.21	1.0	ug/L	282883	1	08/02/2019 11:47	NP
cis-1,2-Dichloroethene	BRL		0.28	1.0	ug/L	282883	1	08/02/2019 11:47	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Cyclohexane	BRL		1.0	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Freon-113	BRL		0.32	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Methyl acetate	BRL		0.42	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Methylene chloride	BRL		1.2	2.0	ug/L	282883	1	08/02/2019 11:47	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-072619-SAG-003
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019 10:50:00 AM
Lab ID:	1907P25-003	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Tetrachloroethene	520		4.6	10	ug/L	282883	10	08/01/2019 22:55	NP
Toluene	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 11:47	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 11:47	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Trichloroethene	1.3		0.30	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	282883	1	08/02/2019 11:47	NP
Surr: 4-Bromofluorobenzene	89.6		0	70-130	%REC	282883	10	08/01/2019 22:55	NP
Surr: 4-Bromofluorobenzene	90.4		0	70-130	%REC	282883	1	08/02/2019 11:47	NP
Surr: Dibromofluoromethane	98.4		0	70-130	%REC	282883	1	08/02/2019 11:47	NP
Surr: Dibromofluoromethane	101		0	70-130	%REC	282883	10	08/01/2019 22:55	NP
Surr: Toluene-d8	94.1		0	70-130	%REC	282883	1	08/02/2019 11:47	NP
Surr: Toluene-d8	95.4		0	70-130	%REC	282883	10	08/01/2019 22:55	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-072619-SAG-004
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019 10:55:00 AM
Lab ID:	1907P25-004	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 12:13	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 12:13	NP
1,1,2-Trichloroethane	1.1		0.43	1.0	ug/L	282883	1	08/02/2019 12:13	NP
1,1-Dichloroethane	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 12:13	NP
1,1-Dichloroethene	BRL		0.40	1.0	ug/L	282883	1	08/02/2019 12:13	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 12:13	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	282883	1	08/02/2019 12:13	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	282883	1	08/02/2019 12:13	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	282883	1	08/02/2019 12:13	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	282883	1	08/02/2019 12:13	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	282883	1	08/02/2019 12:13	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	282883	1	08/02/2019 12:13	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	282883	1	08/02/2019 12:13	NP
2-Butanone	BRL		2.5	5.0	ug/L	282883	1	08/02/2019 12:13	NP
2-Hexanone	BRL		0.67	5.0	ug/L	282883	1	08/02/2019 12:13	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	282883	1	08/02/2019 12:13	NP
Acetone	27		3.6	5.0	ug/L	282883	1	08/02/2019 12:13	NP
Benzene	BRL		0.37	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Bromoform	2.4		0.19	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Bromomethane	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Carbon disulfide	BRL		0.74	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Chloroethane	BRL		0.31	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Chloroform	1.5		0.20	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Chloromethane	1.5		0.21	1.0	ug/L	282883	1	08/02/2019 12:13	NP
cis-1,2-Dichloroethene	BRL		0.28	1.0	ug/L	282883	1	08/02/2019 12:13	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Cyclohexane	BRL		1.0	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Freon-113	BRL		0.32	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Methyl acetate	BRL		0.42	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Methylene chloride	BRL		1.2	2.0	ug/L	282883	1	08/02/2019 12:13	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-072619-SAG-004
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019 10:55:00 AM
Lab ID:	1907P25-004	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Tetrachloroethene	500		4.6	10	ug/L	282883	10	08/01/2019 20:01	NP
Toluene	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 12:13	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 12:13	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Trichloroethene	1.3		0.30	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	282883	1	08/02/2019 12:13	NP
Surr: 4-Bromofluorobenzene	90.6		0	70-130	%REC	282883	10	08/01/2019 20:01	NP
Surr: 4-Bromofluorobenzene	93		0	70-130	%REC	282883	1	08/02/2019 12:13	NP
Surr: Dibromofluoromethane	95.7		0	70-130	%REC	282883	1	08/02/2019 12:13	NP
Surr: Dibromofluoromethane	99.5		0	70-130	%REC	282883	10	08/01/2019 20:01	NP
Surr: Toluene-d8	96.2		0	70-130	%REC	282883	1	08/02/2019 12:13	NP
Surr: Toluene-d8	97.2		0	70-130	%REC	282883	10	08/01/2019 20:01	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-072619-SAG-005
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019 11:55:00 AM
Lab ID:	1907P25-005	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 11:22	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 11:22	NP
1,1,2-Trichloroethane	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 11:22	NP
1,1-Dichloroethane	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 11:22	NP
1,1-Dichloroethene	BRL		0.40	1.0	ug/L	282883	1	08/02/2019 11:22	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 11:22	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	282883	1	08/02/2019 11:22	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	282883	1	08/02/2019 11:22	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	282883	1	08/02/2019 11:22	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	282883	1	08/02/2019 11:22	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	282883	1	08/02/2019 11:22	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	282883	1	08/02/2019 11:22	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	282883	1	08/02/2019 11:22	NP
2-Butanone	BRL		2.5	5.0	ug/L	282883	1	08/02/2019 11:22	NP
2-Hexanone	BRL		0.67	5.0	ug/L	282883	1	08/02/2019 11:22	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	282883	1	08/02/2019 11:22	NP
Acetone	12		3.6	5.0	ug/L	282883	1	08/02/2019 11:22	NP
Benzene	BRL		0.37	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Bromoform	BRL		0.19	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Bromomethane	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Carbon disulfide	BRL		0.74	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Chloroethane	BRL		0.31	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Chloroform	0.76	J	0.20	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Chloromethane	0.91	J	0.21	1.0	ug/L	282883	1	08/02/2019 11:22	NP
cis-1,2-Dichloroethene	2.0		0.28	1.0	ug/L	282883	1	08/02/2019 11:22	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Cyclohexane	BRL		1.0	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Freon-113	BRL		0.32	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Methyl acetate	BRL		0.42	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Methylene chloride	BRL		1.2	2.0	ug/L	282883	1	08/02/2019 11:22	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-072619-SAG-005
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019 11:55:00 AM
Lab ID:	1907P25-005	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Tetrachloroethene	1300		4.6	10	ug/L	282883	10	08/01/2019 20:51	NP
Toluene	4.0		0.39	1.0	ug/L	282883	1	08/02/2019 11:22	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 11:22	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Trichloroethene	19		0.30	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	282883	1	08/02/2019 11:22	NP
Surr: 4-Bromofluorobenzene	93.3		0	70-130	%REC	282883	1	08/02/2019 11:22	NP
Surr: 4-Bromofluorobenzene	92.4		0	70-130	%REC	282883	10	08/01/2019 20:51	NP
Surr: Dibromofluoromethane	97.3		0	70-130	%REC	282883	1	08/02/2019 11:22	NP
Surr: Dibromofluoromethane	97.4		0	70-130	%REC	282883	10	08/01/2019 20:51	NP
Surr: Toluene-d8	99.4		0	70-130	%REC	282883	1	08/02/2019 11:22	NP
Surr: Toluene-d8	98		0	70-130	%REC	282883	10	08/01/2019 20:51	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-072619-SAG-006
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019 12:55:00 PM
Lab ID:	1907P25-006	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 10:56	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 10:56	NP
1,1,2-Trichloroethane	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 10:56	NP
1,1-Dichloroethane	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 10:56	NP
1,1-Dichloroethene	BRL		0.40	1.0	ug/L	282883	1	08/02/2019 10:56	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 10:56	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	282883	1	08/02/2019 10:56	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	282883	1	08/02/2019 10:56	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	282883	1	08/02/2019 10:56	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	282883	1	08/02/2019 10:56	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	282883	1	08/02/2019 10:56	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	282883	1	08/02/2019 10:56	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	282883	1	08/02/2019 10:56	NP
2-Butanone	BRL		2.5	5.0	ug/L	282883	1	08/02/2019 10:56	NP
2-Hexanone	BRL		0.67	5.0	ug/L	282883	1	08/02/2019 10:56	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	282883	1	08/02/2019 10:56	NP
Acetone	19		3.6	5.0	ug/L	282883	1	08/02/2019 10:56	NP
Benzene	BRL		0.37	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Bromoform	BRL		0.19	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Bromomethane	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Carbon disulfide	BRL		0.74	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Chloroethane	BRL		0.31	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Chloroform	BRL		0.20	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Chloromethane	0.48	J	0.21	1.0	ug/L	282883	1	08/02/2019 10:56	NP
cis-1,2-Dichloroethene	BRL		0.28	1.0	ug/L	282883	1	08/02/2019 10:56	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Cyclohexane	BRL		1.0	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Freon-113	BRL		0.32	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Methyl acetate	BRL		0.42	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Methylene chloride	BRL		1.2	2.0	ug/L	282883	1	08/02/2019 10:56	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	GW-077150-072619-SAG-006
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019 12:55:00 PM
Lab ID:	1907P25-006	**Matrix:**	Groundwater

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Tetrachloroethene	21		0.46	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Toluene	BRL		0.39	1.0	ug/L	282883	1	08/02/2019 10:56	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 10:56	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Trichloroethene	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	282883	1	08/02/2019 10:56	NP
Surr: 4-Bromofluorobenzene	90.2		0	70-130	%REC	282883	1	08/02/2019 10:56	NP
Surr: Dibromofluoromethane	97		0	70-130	%REC	282883	1	08/02/2019 10:56	NP
Surr: Toluene-d8	97.7		0	70-130	%REC	282883	1	08/02/2019 10:56	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	TRIP BLANK
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019
Lab ID:	1907P25-007	**Matrix:**	Aqueous

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
1,1,1,2-Tetrachloroethane	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 16:32	NP
1,1,1-Trichloroethane	BRL		0.30	1.0	ug/L	282883	1	08/01/2019 16:32	NP
1,1,2-Trichloroethane	BRL		0.43	1.0	ug/L	282883	1	08/01/2019 16:32	NP
1,1-Dichloroethane	BRL		0.43	1.0	ug/L	282883	1	08/01/2019 16:32	NP
1,1-Dichloroethene	BRL		0.40	1.0	ug/L	282883	1	08/01/2019 16:32	NP
1,2,4-Trichlorobenzene	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 16:32	NP
1,2-Dibromo-3-chloropropane	BRL		0.68	1.0	ug/L	282883	1	08/01/2019 16:32	NP
1,2-Dibromoethane	BRL		0.57	1.0	ug/L	282883	1	08/01/2019 16:32	NP
1,2-Dichlorobenzene	BRL		0.45	1.0	ug/L	282883	1	08/01/2019 16:32	NP
1,2-Dichloroethane	BRL		0.37	1.0	ug/L	282883	1	08/01/2019 16:32	NP
1,2-Dichloropropane	BRL		0.35	1.0	ug/L	282883	1	08/01/2019 16:32	NP
1,3-Dichlorobenzene	BRL		0.31	1.0	ug/L	282883	1	08/01/2019 16:32	NP
1,4-Dichlorobenzene	BRL		0.33	1.0	ug/L	282883	1	08/01/2019 16:32	NP
2-Butanone	BRL		2.5	5.0	ug/L	282883	1	08/01/2019 16:32	NP
2-Hexanone	BRL		0.67	5.0	ug/L	282883	1	08/01/2019 16:32	NP
4-Methyl-2-pentanone	BRL		0.44	5.0	ug/L	282883	1	08/01/2019 16:32	NP
Acetone	BRL		3.6	5.0	ug/L	282883	1	08/01/2019 16:32	NP
Benzene	BRL		0.37	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Bromodichloromethane	BRL		0.25	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Bromoform	BRL		0.19	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Bromomethane	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Carbon disulfide	BRL		0.74	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Carbon tetrachloride	BRL		0.29	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Chlorobenzene	BRL		0.42	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Chloroethane	BRL		0.31	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Chloroform	BRL		0.20	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Chloromethane	BRL		0.21	1.0	ug/L	282883	1	08/01/2019 16:32	NP
cis-1,2-Dichloroethene	BRL		0.28	1.0	ug/L	282883	1	08/01/2019 16:32	NP
cis-1,3-Dichloropropene	BRL		0.31	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Cyclohexane	BRL		1.0	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Dibromochloromethane	BRL		0.43	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Dichlorodifluoromethane	BRL		0.15	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Ethylbenzene	BRL		0.26	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Freon-113	BRL		0.32	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Isopropylbenzene	BRL		0.43	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Methyl acetate	BRL		0.42	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Methyl tert-butyl ether	BRL		0.45	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Methylcyclohexane	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Methylene chloride	BRL		1.2	2.0	ug/L	282883	1	08/01/2019 16:32	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Not detected at MDL
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- NC Not confirmed
- E Estimated value above quantitation range
- S Spike Recovery outside limits due to matrix
- J Estimated value detected below Reporting Limit
- > Greater than Result value
- < Less than Result value
- Narr See case narrative

Analytical Environmental Services, Inc **Date:** 2-Aug-19

Client:	GHD Services, Inc.	**Client Sample ID:**	TRIP BLANK
Project Name:	Bluewater Thermal Solutions	**Collection Date:**	7/26/2019
Lab ID:	1907P25-007	**Matrix:**	Aqueous

Analyses	Result	Qual	MDL	Reporting Limit	Units	BatchID	DF	Date Analyzed	Analyst
Volatile Organic Compounds by GC/MS SW8260D (SW5030B)									
Styrene	BRL		0.15	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Tetrachloroethene	BRL		0.46	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Toluene	BRL		0.39	1.0	ug/L	282883	1	08/01/2019 16:32	NP
trans-1,2-Dichloroethene	BRL		0.30	1.0	ug/L	282883	1	08/01/2019 16:32	NP
trans-1,3-Dichloropropene	BRL		0.32	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Trichloroethene	BRL		0.30	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Trichlorofluoromethane	BRL		0.18	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Vinyl chloride	BRL		0.30	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Xylenes, Total	BRL		0.77	1.0	ug/L	282883	1	08/01/2019 16:32	NP
Surr: 4-Bromofluorobenzene	91.5		0	70-130	%REC	282883	1	08/01/2019 16:32	NP
Surr: Dibromofluoromethane	97.8		0	70-130	%REC	282883	1	08/01/2019 16:32	NP
Surr: Toluene-d8	101		0	70-130	%REC	282883	1	08/01/2019 16:32	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated value above quantitation range
BRL	Not detected at MDL	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	J	Estimated value detected below Reporting Limit
N	Analyte not NELAC certified	>	Greater than Result value
B	Analyte detected in the associated method blank	<	Less than Result value
NC	Not confirmed	Narr	See case narrative

Clear Save as

AES ANALYTICAL ENVIRONMENTAL SERVICES, INC.

SAMPLE/COOLER RECEIPT CHECKLIST

1. Client Name: **GHD Services, Inc.** AES Work Order Number: **1907P25**

2. Carrier: FedEx ☐ UPS ☐ USPS ☐ Client ■ Courier ☐ Other _____

		Yes	No	N/A	Details	Comments
3.	Shipping container/cooler received in good condition?	●	○	○	damaged ☐ leaking ☐ other ☐	
4.	Custody seals present on shipping container?	○	●	○		
5.	Custody seals intact on shipping container?	○	○	●		
6.	Temperature blanks present?	●	○	○		
7.	Cooler temperature(s) within limits of 0-6°C? [See item 13 and 14 for temperature recordings.]	●	○	○	Cooling initiated for recently collected samples / ice present ☐	
8.	Chain of Custody (COC) present?	●	○	○		
9.	Chain of Custody signed, dated, and timed when relinquished and received?	●	○	○		
10.	Sampler name and/or signature on COC?	●	○	○		
11.	Were all samples received within holding time?	●	○	○		
12.	TAT marked on the COC?	●	○	○	If no TAT indicated, proceeded with standard TAT per Terms & Conditions. ☐	

13. Cooler 1 Temperature 1.0 °C Cooler 2 Temperature _____ °C Cooler 3 Temperature _____ °C Cooler 4 Temperature _____ °C

14. Cooler 5 Temperature _____ °C Cooler 6 Temperature _____ °C Cooler 7 Temperature _____ °C Cooler 8 Temperature _____ °C

15. Comments: _____

I certify that I have completed sections 1-15 (dated initials). MJ 7/26/19

		Yes	No	N/A	Details	Comments
16.	Were sample containers intact upon receipt?	●	○	○		
17.	Custody seals present on sample containers?	○	●	○		
18.	Custody seals intact on sample containers?	○	○	●		
19.	Do sample container labels match the COC?	●	○	○	incomplete info ☐ illegible ☐ no label ☐ other ☐	
20.	Are analyses requested indicated on the COC?	●	○	○		
21.	Were all of the samples listed on the COC received?	●	○	○	samples received but not listed on COC ☐ samples listed on COC not received ☐	
22.	Was the sample collection date/time noted?	●	○	○		
23.	Did we receive sufficient sample volume for indicated analyses?	●	○	○		
24.	Were samples received in appropriate containers?	●	○	○		
25.	Were VOA samples received without headspace (< 1/4" bubble)?	●	○	○		
26.	Were trip blanks submitted?	●	○	○	listed on COC ☐ not listed on COC ☐	

27. Comments: _____

This section only applies to samples where pH can be checked at Sample Receipt.

I certify that I have completed sections 16-27 (dated initials). HB 7/26/19

		Yes	No	N/A	Details	Comments
28.	Have containers needing chemical preservation been checked? *	○	○	●		
29.	Containers meet preservation guidelines?	○	○	●		
30.	Was pH adjusted at Sample Receipt?	○	○	●		

* Note: Certain analyses require chemical preservation but must be checked in the laboratory and not upon Sample Receipt such as Coliforms, VOCs and Oil & Grease/TPH.

I certify that I have completed sections 28-30 (dated initials). HB 7/26/19

Locked

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1907P25

ANALYTICAL QC SUMMARY REPORT

BatchID: 282883

Sample ID: **MB-282883** Client ID: Units: **ug/L** Prep Date: **08/01/2019** Run No: **403937**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **282883** Analysis Date: **08/01/2019** Seq No: **9072065**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	BRL	1.0									
1,1,1-Trichloroethane	BRL	1.0									
1,1,2-Trichloroethane	BRL	1.0									
1,1-Dichloroethane	BRL	1.0									
1,1-Dichloroethene	BRL	2.0									
1,2,4-Trichlorobenzene	BRL	1.0									
1,2-Dibromo-3-chloropropane	BRL	1.0									
1,2-Dibromoethane	BRL	1.0									
1,2-Dichlorobenzene	BRL	1.0									
1,2-Dichloroethane	BRL	1.0									
1,2-Dichloropropane	BRL	1.0									
1,3-Dichlorobenzene	BRL	1.0									
1,4-Dichlorobenzene	BRL	1.0									
2-Butanone	BRL	10									
2-Hexanone	BRL	10									
4-Methyl-2-pentanone	BRL	10									
Acetone	BRL	20									
Benzene	BRL	1.0									
Bromodichloromethane	BRL	1.0									
Bromoform	BRL	1.0									
Bromomethane	BRL	1.0									
Carbon disulfide	BRL	5.0									
Carbon tetrachloride	BRL	2.0									
Chlorobenzene	BRL	1.0									
Chloroethane	BRL	1.0									
Chloroform	BRL	1.0									
Chloromethane	BRL	1.0									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1907P25

ANALYTICAL QC SUMMARY REPORT

BatchID: 282883

Sample ID: **MB-282883** Client ID: Units: **ug/L** Prep Date: **08/01/2019** Run No: **403937**
SampleType: **MBLK** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **282883** Analysis Date: **08/01/2019** Seq No: **9072065**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	BRL	1.0									
cis-1,3-Dichloropropene	BRL	1.0									
Cyclohexane	BRL	2.0									
Dibromochloromethane	BRL	1.0									
Dichlorodifluoromethane	BRL	1.0									
Ethylbenzene	BRL	1.0									
Freon-113	BRL	5.0									
Isopropylbenzene	BRL	1.0									
Methyl acetate	BRL	2.0									
Methyl tert-butyl ether	BRL	1.0									
Methylcyclohexane	BRL	2.0									
Methylene chloride	BRL	5.0									
Styrene	BRL	1.0									
Tetrachloroethene	BRL	1.0									
Toluene	BRL	1.0									
trans-1,2-Dichloroethene	BRL	2.0									
trans-1,3-Dichloropropene	BRL	2.0									
Trichloroethene	BRL	1.0									
Trichlorofluoromethane	BRL	1.0									
Vinyl chloride	BRL	1.0									
Xylenes, Total	BRL	1.0									
Surr: 4-Bromofluorobenzene	46.42	0	50.00		92.8	70	130				
Surr: Dibromofluoromethane	49.25	0	50.00		98.5	70	130				
Surr: Toluene-d8	50.03	0	50.00		100	70	130				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1907P25

ANALYTICAL QC SUMMARY REPORT

BatchID: 282883

Sample ID: **LCS-282883** Client ID: Units: **ug/L** Prep Date: **08/01/2019** Run No: **403937**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **282883** Analysis Date: **08/01/2019** Seq No: **9072064**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	50.21	1.0	50.00		100	70	130				
1,1,1-Trichloroethane	44.70	1.0	50.00		89.4	70	130				
1,1,2-Trichloroethane	55.05	1.0	50.00		110	70	130				
1,1-Dichloroethane	44.76	1.0	50.00		89.5	70	130				
1,1-Dichloroethene	43.25	2.0	50.00		86.5	60	140				
1,2,4-Trichlorobenzene	45.08	1.0	50.00		90.2	70	130				
1,2-Dibromo-3-chloropropane	53.40	1.0	50.00		107	70	130				
1,2-Dibromoethane	59.24	1.0	50.00		118	70	130				
1,2-Dichlorobenzene	53.85	1.0	50.00		108	70	130				
1,2-Dichloroethane	52.68	1.0	50.00		105	70	130				
1,2-Dichloropropane	53.92	1.0	50.00		108	70	130				
1,3-Dichlorobenzene	55.40	1.0	50.00		111	70	130				
1,4-Dichlorobenzene	54.67	1.0	50.00		109	70	130				
Benzene	52.78	1.0	50.00		106	70	130				
Bromodichloromethane	52.71	1.0	50.00		105	70	130				
Bromoform	59.89	1.0	50.00		120	70	130				
Carbon tetrachloride	48.56	2.0	50.00		97.1	70	130				
Chlorobenzene	55.94	1.0	50.00		112	70	130				
Chloroform	48.60	1.0	50.00		97.2	70	130				
cis-1,2-Dichloroethene	49.69	1.0	50.00		99.4	70	130				
cis-1,3-Dichloropropene	51.64	1.0	50.00		103	70	130				
Dibromochloromethane	50.76	1.0	50.00		102	70	130				
Ethylbenzene	56.90	1.0	50.00		114	70	130				
Isopropylbenzene	49.67	1.0	50.00		99.3	70	130				
Methylene chloride	46.57	5.0	50.00		93.1	70	130				
Styrene	55.76	1.0	50.00		112	70	130				
Tetrachloroethene	56.26	1.0	50.00		113	70	130				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1907P25

ANALYTICAL QC SUMMARY REPORT

BatchID: 282883

Sample ID: **LCS-282883** Client ID: Units: **ug/L** Prep Date: **08/01/2019** Run No: **403937**
SampleType: **LCS** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **282883** Analysis Date: **08/01/2019** Seq No: **9072064**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Toluene	56.39	1.0	50.00		113	70	130				
trans-1,2-Dichloroethene	45.94	2.0	50.00		91.9	70	130				
trans-1,3-Dichloropropene	53.85	2.0	50.00		108	70	130				
Trichloroethene	52.54	1.0	50.00		105	70	130				
Vinyl chloride	52.82	1.0	50.00		106	70	130				
Xylenes, Total	174.5	1.0	150.0		116	70	130				
Surr: 4-Bromofluorobenzene	50.61	0	50.00		101	70	130				
Surr: Dibromofluoromethane	50.60	0	50.00		101	70	130				
Surr: Toluene-d8	52.51	0	50.00		105	70	130				

Sample ID: **1907P25-003AMS** Client ID: **GW-077150-072619-SAG-003** Units: **ug/L** Prep Date: **08/01/2019** Run No: **403937**
SampleType: **MS** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **282883** Analysis Date: **08/01/2019** Seq No: **9072080**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	436.1	10	500.0		87.2	70	139				
1,1,1-Trichloroethane	377.6	10	500.0		75.5	66.7	137				
1,1,2-Trichloroethane	493.7	10	500.0		98.7	71.8	130				
1,1-Dichloroethane	398.7	10	500.0		79.7	63.7	134				
1,1-Dichloroethene	359.7	20	500.0		71.9	63.8	146				
1,2,4-Trichlorobenzene	363.9	10	500.0		72.8	57.1	144				
1,2-Dibromo-3-chloropropane	425.5	10	500.0		85.1	56.7	133				
1,2-Dibromoethane	506.4	10	500.0		101	69.5	133				
1,2-Dichlorobenzene	459.8	10	500.0		92.0	68.3	135				
1,2-Dichloroethane	464.8	10	500.0		93.0	67	136				
1,2-Dichloropropane	472.9	10	500.0		94.6	70.8	130				
1,3-Dichlorobenzene	460.7	10	500.0		92.1	65.8	136				
1,4-Dichlorobenzene	463.8	10	500.0		92.8	69.2	133				
Benzene	448.2	10	500.0		89.6	70.2	137				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1907P25

ANALYTICAL QC SUMMARY REPORT

BatchID: 282883

Sample ID: **1907P25-003AMS** Client ID: **GW-077150-072619-SAG-003** Units: **ug/L** Prep Date: **08/01/2019** Run No: **403937**
SampleType: **MS** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **282883** Analysis Date: **08/01/2019** Seq No: **9072080**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Bromodichloromethane	450.7	10	500.0		90.1	62	137				
Bromoform	497.2	10	500.0		99.4	59.7	136				
Carbon tetrachloride	413.6	20	500.0		82.7	67.7	146				
Chlorobenzene	474.8	10	500.0		95.0	72.7	141				
Chloroform	426.0	10	500.0		85.2	65.6	134				
cis-1,2-Dichloroethene	439.0	10	500.0		87.8	65.9	136				
cis-1,3-Dichloropropene	369.2	10	500.0		73.8	61.7	127				
Dibromochloromethane	431.7	10	500.0		86.3	60.4	135				
Ethylbenzene	374.0	10	500.0		74.8	73	135				
Isopropylbenzene	351.9	10	500.0		70.4	65.9	137				
Methylene chloride	422.2	50	500.0		84.4	64.1	133				
Styrene	15.40	10	500.0		3.08	71.2	137				S
Tetrachloroethene	994.3	10	500.0	518.9	95.1	67.6	146				
Toluene	368.2	10	500.0		73.6	67	141				
trans-1,2-Dichloroethene	404.0	20	500.0		80.8	64	139				
trans-1,3-Dichloropropene	373.7	20	500.0		74.7	60.3	117				
Trichloroethene	477.3	10	500.0		95.5	69.3	141				
Vinyl chloride	239.4	10	500.0		47.9	63.2	148				S
Xylenes, Total	254.1	10	1500		16.9	77.9	138				S
Surr: 4-Bromofluorobenzene	458.1	0	500.0		91.6	70	130				
Surr: Dibromofluoromethane	515.4	0	500.0		103	70	130				
Surr: Toluene-d8	505.9	0	500.0		101	70	130				

Sample ID: **1907P25-002ADUP** Client ID: **GW-077150-072619-SAG-002** Units: **ug/L** Prep Date: **08/01/2019** Run No: **403937**
SampleType: **DUP** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **282883** Analysis Date: **08/01/2019** Seq No: **9072077**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	BRL	10						0	0	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1907P25

ANALYTICAL QC SUMMARY REPORT

BatchID: 282883

Sample ID: **1907P25-002ADUP** Client ID: **GW-077150-072619-SAG-002** Units: **ug/L** Prep Date: **08/01/2019** Run No: **403937**
SampleType: **DUP** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **282883** Analysis Date: **08/01/2019** Seq No: **9072077**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	10						0	0	20	
1,1,2-Trichloroethane	BRL	10						0	0	20	
1,1-Dichloroethane	BRL	10						0	0	20	
1,1-Dichloroethene	BRL	20						0	0	20	
1,2,4-Trichlorobenzene	BRL	10						0	0	20	
1,2-Dibromo-3-chloropropane	BRL	10						0	0	20	
1,2-Dibromoethane	BRL	10						0	0	20	
1,2-Dichlorobenzene	BRL	10						0	0	20	
1,2-Dichloroethane	BRL	10						0	0	20	
1,2-Dichloropropane	BRL	10						0	0	20	
1,3-Dichlorobenzene	BRL	10						0	0	20	
1,4-Dichlorobenzene	BRL	10						0	0	20	
2-Butanone	BRL	100						0	0	20	
2-Hexanone	BRL	100						0	0	20	
4-Methyl-2-pentanone	BRL	100						0	0	20	
Acetone	BRL	200						0	0	20	
Benzene	BRL	10						0	0	20	
Bromodichloromethane	BRL	10						0	0	20	
Bromoform	BRL	10						0	0	20	
Bromomethane	BRL	10						0	0	20	
Carbon disulfide	BRL	50						0	0	20	
Carbon tetrachloride	BRL	20						0	0	20	
Chlorobenzene	BRL	10						0	0	20	
Chloroethane	BRL	10						0	0	20	
Chloroform	BRL	10						0	0	20	
Chloromethane	BRL	10						0	0	20	
cis-1,2-Dichloroethene	BRL	10						0	0	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: GHD Services, Inc.
Project Name: Bluewater Thermal Solutions
Workorder: 1907P25

ANALYTICAL QC SUMMARY REPORT

BatchID: 282883

Sample ID: **1907P25-002ADUP** Client ID: **GW-077150-072619-SAG-002** Units: **ug/L** Prep Date: **08/01/2019** Run No: **403937**
SampleType: **DUP** TestCode: **Volatile Organic Compounds by GC/MS SW8260D** BatchID: **282883** Analysis Date: **08/01/2019** Seq No: **9072077**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,3-Dichloropropene	BRL	10						0	0	20	
Cyclohexane	BRL	20						0	0	20	
Dibromochloromethane	BRL	10						0	0	20	
Dichlorodifluoromethane	BRL	10						0	0	20	
Ethylbenzene	BRL	10						0	0	20	
Freon-113	BRL	50						0	0	20	
Isopropylbenzene	BRL	10						0	0	20	
Methyl acetate	BRL	20						0	0	20	
Methyl tert-butyl ether	BRL	10						0	0	20	
Methylcyclohexane	BRL	20						0	0	20	
Methylene chloride	BRL	50						0	0	20	
Styrene	BRL	10						0	0	20	
Tetrachloroethene	325.4	10						309.4	5.04	20	
Toluene	27.00	10						27.10	0.370	20	
trans-1,2-Dichloroethene	BRL	20						0	0	20	
trans-1,3-Dichloropropene	BRL	20						0	0	20	
Trichloroethene	BRL	10						0	0	20	
Trichlorofluoromethane	BRL	10						0	0	20	
Vinyl chloride	BRL	10						0	0	20	
Xylenes, Total	BRL	10						0	0	20	
Surr: 4-Bromofluorobenzene	455.4	0						450.7	0	0	
Surr: Dibromofluoromethane	483.2	0						493.2	0	0	
Surr: Toluene-d8	498.6	0						499.8	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Table 1
Field Sample Key
3-Month Performance Groundwater Sampling
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample ID	*Sample Location*	*Collection Date*	*Collection Time*	*VOCs*	Comments
GW-077150-042519-SAG-001	MW-6-16	25-Apr-19	9:45	X	
GW-077150-042519-SAG-002	TW-11	25-Apr-19	10:40	X	
GW-077150-042519-SAG-003	TW-10	25-Apr-19	11:30	X	
GW-077150-042519-SAG-004	TW-10	25-Apr-19	11:35	X	
GW-077150-042519-SAG-005	MW-1S-16	25-Apr-19	12:25	X	High conductivity
GW-077150-042519-SAG-006	MW-5-16	25-Apr-19	13:25	X	High pH and conductivity
TRIP BLANK				X	

Table 1
Field Sample Key
6-Month Performance Groundwater Sampling
Former Bluewater Thermal Solutions
Fountain Inn, South Carolina

Sample ID	*Sample Location*	*Collection Date*	*Collection Time*	*VOCs*	*Persulfate (mg/L)*	Comments
GW-077150-072619-SAG-001	MW-6-16	26-Jul-19	8:45	X	0.0	
GW-077150-072619-SAG-002	TW-11	26-Jul-19	9:40	X	2.5	
GW-077150-072619-SAG-003	MW-1S-16	26-Jul-19	10:50	X	5.5	High conductivity
GW-077150-072619-SAG-004	MW-1S-16	26-Jul-19	10:55	X	-	Duplicate sample
GW-077150-072619-SAG-005	TW-10	26-Jul-19	11:55	X	2.0	
GW-077150-072619-SAG-006	MW-5-16	26-Jul-19	12:55	X	4.0	High pH and conductivity
TRIP BLANK				X		

about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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