Proactive by Design

PRELIMINARY GEOTECHNICAL ENGINEERING REPORT
PROPOSED COMMERCIAL DEVELOPMENT

15-23 Pleasant Street / 11-17 Dartmouth Street
Malden, Massachusetts

February 17, 2020
File No. 04.0191051.00

PREPARED FOR:
Quaker Lane Capital
Boston, Massachusetts

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Via Email

February 17, 2020
File No. 04.0191051.00

Mr. Mark Barer, Principal
Quaker Lane Capital
200 Portland Street
Boston, Massachusetts 02114

Re: Preliminary Geotechnical Engineering Report
Proposed Commercial Development
15-23 Pleasant Street / 11-17 Dartmouth Street
Malden, Massachusetts

Dear Mr. Barer:

This report presents the results of a preliminary geotechnical engineering study performed by GZA GeoEnvironmental, Inc. (GZA) for Quaker Lane Capital (Client; Quaker) for a proposed real estate development located at 15-23 Pleasant Street and 11-17 Dartmouth Street in Malden, Massachusetts. GZA conducted this study in accordance with our proposal for Professional Services dated November 6, 2019. The contents of this report are subject to the *Limitations* set forth in **Appendix A**.

OBJECTIVES AND SCOPE OF SERVICES

The objectives of our work were to evaluate subsurface conditions based on a limited subsurface exploration program, perform geotechnical engineering analyses, and provide preliminary geotechnical engineering recommendations for the proposed development. To meet these objectives, GZA completed the following Scope of Services:

- Performed a file review of available documents for the site, including building plans in the public record for properties adjacent to and in the vicinity of the proposed development;
- Reviewed the existing conditions plan and reports provided by Quaker to GZA;
- Pre-marked the proposed boring locations; our drilling subcontractor then contacted Dig Safe®;
- Drilled two test borings and installed one monitoring well in one of the completed test borings;
- Submitted two soil samples for environmental laboratory testing for disposal pre-characterization;
- Conducted geotechnical engineering analyses to evaluate the impacts of the subsurface conditions on the proposed development; and

- Prepared this report summarizing our preliminary findings and recommendations.

BACKGROUND AND SITE DESCRIPTION

The site consists of four contiguous parcels, with a total area of approximately 0.8 acres, located in Malden, Massachusetts, as shown on **Figure 1, Locus Plan**. The site is currently developed with a three-story building which is connected to an adjacent two-story building and an adjacent asphalt parking lot, both of which are currently in use. Developed parcels are adjacent to the northern, eastern, and southern limits of the site. The site is bounded to the west by Dartmouth Street. Based on available contour plans available through the City of Malden, current site grades likely vary from about Elevation 15 feet to Elevation 18 feet (unknown datum). Accordingly, the site is relatively flat with a slight descending slope from north to the south toward Pleasant Street.

Previous reports and investigations have been conducted for the site. GZA reviewed the following reports and plans prepared for the site provided by Quaker:

- A draft report entitled "Phase I Environmental Site Assessment, Commercial Buildings 15-23 Pleasant Street, 11-17 Dartmouth Street, Malden, Massachusetts," dated September 27, 2019 and prepared by Vertex Companies of Weymouth, Massachusetts;
- Undated conceptual plans from a site feasibility study by Gensler of Boston, Massachusetts, received by GZA on January 3, 2020; and
- A survey plan entitled "ALTA/NSPS Land Title Survey, 15-23 Pleasant Street, 11-19 Dartmouth Street, 7 Dartmouth Street, and 9 Dartmouth Street, Malden, Mass", dated October 15, 2019 by Feldman Land Surveyors of Boston, Massachusetts.

According to the Environmental Site Assessment (ESA), the building located at 11 Dartmouth Street in the southern portion of the site was originally constructed in the 1940s as a two-story building; a third story was added between 2002 and 2004. The building has a cast-in-place concrete basement and is constructed with a mixture of wood, concrete, and masonry, and has an exterior brick veneer. The building abuts a two-story building to the south which also has a cast-in-place concrete basement. A movie theater formerly occupied the existing parking lot area at 17 Dartmouth Street; the building burned down and was demolished in 1990. According to the ESA report, the movie theater was two stories with a single-level basement. GZA observed a foundation remnant along the western parking lot fence that may have been from the former theater building. An underground culvert, likely constructed in the mid-1800s, conveys Spot Pond Brook along the eastern edge of the site as shown on **Figure 2**. Although not specified, it is assumed that the bottom of the culvert is unlined.

1. Historic photo of Spot Pond Brook culvert on Pleasant Street – April 30, 1904 (Digital Commonwealth)

Proposed Development

Based on our review of the most recent conceptual development plans provided January 3, 2020, the proposed development consists of a steel-framed office and retail building with up to 12 stories above grade and a two-level parking garage below grade. The proposed building will have a footprint of approximately 16,000 to 17,000 square feet, as shown on **Figure 3**. Based on discussions with Quaker, the parking garage will require excavation to a depth of approximately 25 to 30 feet below existing site grades. The southwestern portion of the building will also include a three-story retail wing adjacent to the 12-story building. The existing three-story building will need to be demolished and detached from the adjoining two-story in the southern portion of the site to facilitate site development as shown on **Figures 2 and 3**. Changes in existing grades outside the footprint are not anticipated to be greater than about 2 feet for the proposed development. Building loads are not known at the time of this report, but we anticipate building loads will be approximately 120 pounds per square-foot (psf) per floor based on input from Structural Engineers from similar building projects we have worked on.

ON-SITE AND ADJACENT / NEARBY SITE INFORMATION

GZA visited the City of Malden building department and reviewed available foundation plans for the buildings adjacent to the site. The building department had limited foundation information primarily consisting of a few renovations and elevator shafts for the nearby buildings. However, based on visual observations made by GZA and our review of the Vertex ESA report, the buildings to the south and east of the proposed development have basements and are likely founded on spread footings. Based on the information reviewed, it is unclear if the adjacent buildings have multiple levels of basements. The building to the north of the site (480 Main Street) was constructed in 2012 and is likely founded on spread footings. The site drainage plans for 480 Main Street indicate site drainage and roof drains discharge to the underground Spot Pond Brook Culvert. The depth of the culvert is not known within the site limits, but Vertex observed the culvert in the crawl space of the 15 Pleasant Street basement, so it is likely 5 to 10 feet below ground surface.

1. Aerial Image of site (Google Maps 2020). Building in blue to be demolished.

SUBSURFACE EXPLORATIONS

GZA retained the services of New England Boring Contractors, Inc. (NEBC) of Derry, New Hampshire to drill two test borings (GZ-1 and GZ-2) to evaluate subsurface conditions at the site. NEBC drilled the test borings during the period from January 8 to 10, 2020 to depths of approximately 30 and 99.5 feet below ground surface (bgs) using a truck-mounted drill rig. The drillers used 4-inch-inside-diameter casing and drive-and-wash drilling techniques. NEBC conducted Standard Penetration Testing (SPT) and split-spoon sampling continuously for the entire depth of boring GZ-1 and the upper 12 feet of boring GZ-2. Below a depth of 12 feet in boring GZ-2, SPTs and split-spoon sampling were generally conducted at 5-foot intervals. Split-spoon sampling and SPTs were completed in general accordance with ASTM D1586. GZA field-screened samples collected from boring GZ-1 for the presence of volatile organic compounds using a photoionization detector equipped with a 10.6eV lamp.

GZA personnel observed the drilling and prepared boring logs included as **Appendix B**. Samples were visually classified according to the Modified Burmister classification system. Approximate as-drilled boring locations were located by GZA personnel using taped ties to existing structures and site features and are shown on **Figure 2**.

GEOTECHNICAL LABORATORY TESTING

GZA submitted three soil samples recovered from the borings for gradation analyses to confirm visual-manual field classifications and to help estimate the engineering properties of the soils encountered. Thielsch Engineering of Cranston, Rhode Island performed the laboratory testing program; test results are included in **Appendix C**.

ENVIRONMENTAL LABORATORY TESTING

GZA performed the following environmental soil pre-characterization testing to help assess off-site disposal options. GZA analyzed the samples for the suite of parameters outlined by Massachusetts Department of Environmental Protection (MassDEP) Policy # COMM-97-001 Reuse & Disposal of Contaminated Soil at Massachusetts Landfills. The COMM-97-001 policy outlines the requirements, standards, management practices, and approvals for the testing, tracking, transport, and reuse or disposal of contaminated soil at Massachusetts landfills.

GZA collected two composite soil samples from boring GZ-1: one from the upper 6 feet bgs and one from 20 to 30 feet bgs. GZA submitted the samples to ESS Laboratory of Cranston, Rhode Island for analysis for the following parameters:

- Massachusetts Contingency Plan (MCP) 14 Metals (by Environmental Protection Agency (EPA) Method 6010C/7471B;
- Volatile Organic Compounds (VOCs) via EPA Method 5035/8260B;
- Semi-volatiles (SVOCs) (including Pyridine) via EPA Method 8270C;
- Polychlorinated biphenyls (PCBs) via EPA Method 8082;
- Total petroleum hydrocarbons (TPH) via EPA Method 8100M;
- Organochlorine pesticides by EPA Method 8081B;
- Chlorinated herbicides by EPA Method 8151A;
- Reactive cyanide and sulfide via SW 846 Chapter 7.3.4.1/7.3.3.2;
- Ignitability/flashpoint via EPA Method 1010;
- Corrosivity (EPA 9040/9045); and
- pH and conductivity.

We discuss the results of the soil pre-characterization tests below in the Environmental Soil Management section. Laboratory test results for the soil samples taken are included in **Appendix D** and summarized in **Table 1**.

SUBSURFACE CONDITIONS

GZA encountered two soil strata in the completed test borings drilled at the site: Fill, overlying natural Sand and Gravel. Based on the GZA borings, we presented the encountered thicknesses, and generalized descriptions, in descending order from ground surface, in the following table.

GENERALIZED SUBSURFACE CONDITIONS		
Soil Unit	**Approx. Thickness (feet)**	**Generalized Description**
Fill	5.7 to 9.6	FROM Loose to very dense, brown to olive/gray, fine to coarse SAND with up to 50 percent Gravel and up to 50 percent Silt TO soft to medium stiff, olive, Clayey SILT with up to 50 percent fine to medium Sand and up to 20 percent Gravel was encountered in borings GZ-1 and GZ-2.
Fill with Debris	4.1 to 9.4	GZA encountered Loose to medium dense, brown to gray, fine to medium SAND with up to 50 Gravel and up to 20 percent Silt, with Brick, Concrete, and Wood in borings GZ-1 and GZ-2. Concrete foundation remnants were encountered between 5.7 and 9.8 feet bgs in test boring GZ-1.
Sand and Gravel	>20.2 to >82	Medium dense to very dense, brown to gray, fine to coarse SAND with up to 50 percent Gravel and/or up to 35 percent Silt. GZA did not observe the bottom of the Sand and Gravel stratum in the test borings.

GZA has provided detailed descriptions of the materials encountered at specific locations in the boring logs prepared by GZA and included in **Appendix B**.

GROUNDWATER

GZA installed a groundwater observation well in boring GZ-1 to evaluate the stabilized depth to groundwater. GZA obtained groundwater measurements at the completion of well installation, 24 hours after well installation, and 20 days after well installation. GZA measured the stabilized depth to groundwater at a depth of 8.9 feet bgs after a stabilization time of approximately 20 days.

The groundwater observations were made at the times and under the conditions stated in the boring logs. Fluctuations in groundwater levels will occur due to variations in season, precipitation, infiltration, soil conditions, and other factors.

GEOTECHNICAL IMPLICATIONS

Based on our current understanding of the subsurface conditions, the primary geotechnical issues that impact the Site development include; the presence of variable fill soils at the site within the proposed building footprint, relatively shallow groundwater conditions, the proposed depth of excavation, protection of abutting properties during construction, and the temporary support of excavation .

- **Foundation Type and Capacity for the Proposed Structure**. GZA encountered medium dense granular soils below the anticipated bearing level (about 25 to 30 feet below existing grade) for the building. However, GZA did encounter a zone of loose soil at approximately 45 to 55 feet below ground surface. This zone should be further evaluated in future subsurface investigations to investigate if it is isolated to a small area or extends laterally across the site. Based on the subsurface conditions encountered in the recent GZA borings, a mat foundation or spread footings are feasible foundation types. Foundation types for specific areas within the structure will need to consider design loads, permanent groundwater control, and construction means/methods.

- **Previous Site Development**. During construction, contractors may encounter remnants of the historic structures and associated below-grade utilities which will require removal to facilitate the new construction.

- **Permanent Groundwater Control**. We anticipate the lowest level of the below grade parking garage will be approximately 20 feet below groundwater. The garage structure will need to be designed for permanent groundwater control and/or to resist hydrostatic uplift forces.

- **Temporary Groundwater Control**. Soils at the site are relatively permeable and are likely to be influenced by the adjacent Spot Pond Brook culvert. Therefore, the design of the excavation support and temporary groundwater control systems for the garage excavation will need to consider the potential for significant groundwater inflow. Temporary construction dewatering may draw down groundwater levels outside the excavation and the potential effects on adjacent properties should be evaluated. In addition, if groundwater is not adequately controlled before excavation there is the potential for disturbance of the subgrade due to upward seepage.

- **Adjacent Structures**. The deep excavations required for the proposed basement construction may potentially impact abutting structures. Nearby buildings and structures will need to be monitored for vibrations and settlement, as well as effects from dewatering during construction. Some adjacent structures may require temporary support and/or permanent foundation underpinning.

- **Soil Disposal.** The proposed excavation will require off-site disposal of the excavated soil. Typically, soil to be excavated is pre-characterized each 500 cubic yards to facilitate live loading; some soil disposal facilities may require a higher pre-characterization frequency. The fill soils at the site are likely to be variable and the disposal requirements may vary. The cost and capacity of disposal facilities may vary depending on demand and timing. Therefore, disposal contingency costs should be allotted during project cost estimating.

PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

The preliminary geotechnical recommendations provided in the following subsections were based on assumed loading conditions typical of the proposed construction and are based on the International Building Code of 2015 (IBC 2015) with Massachusetts State Building Code 9th Edition (MSBC) amendments.

BUILDING FOUNDATIONS

GZA recommends supporting the proposed building/garage on a mat foundation and/or spread footings bearing on undisturbed, natural sand and gravel. The preliminary bearing pressures discussed below assume total post-construction settlement to be less than 1 inch and differential settlement less than ½ inch.

Mat Foundations

The building/garage structure may be supported on a reinforced concrete mat foundation bearing on undisturbed soils consisting of natural sand and gravel. The mat should be constructed over the prepared, undisturbed subgrade, with at least 8-inches of compacted ¾-inch Crushed Stone placed over non-woven filter fabric.

When modelling the stiffness of the soil-structure system, the structural engineer should use a preliminary vertical modulus of subgrade reaction (k) of to 120 pounds per cubic inch (referenced to a 1-foot by 1-foot plate load area) for the mat design, provided the mat is designed and constructed in accordance with the recommendations herein. We recommend a preliminary design value of a maximum contact pressure of 2 tons per square foot. These parameters assume that the mat bears on at least 8 inches of compacted ¾-inch Crushed Stone over suitable

bearing soils. Should the structural engineer require a higher modulus for mat design, we can review this value further.

Under the permanent condition, the net load is likely downward, but the structural engineer should evaluate temporary and permanent loading conditions with hydrostatic pressures once building loads have been determined.

The mat subgrade may become easily disturbed during construction should hydrostatic pressures be present. It will be important to dewater soils ahead of excavation so that excavation is in-the-dry; groundwater seepage at the excavated subgrade will cause subgrade disturbance and instability.

Spread Footing Foundations

If certain areas of the building are supported where a mat foundation is not required to resist hydrostatic uplift, we recommend supporting the structure on spread footing foundations bearing on compacted Structural Fill over undisturbed, natural sand and gravel, following removal of the existing fill and former foundation/utility elements, if any, from within the bearing zone-of-influence of the footings. The bearing-zone-of-influence is defined by a plane extending from the lower outside edge of the footing downward and outward at a 45-degree angle. Footings should be designed in accordance with the MSBC.

We recommend a preliminary net allowable bearing pressure of 2 tons per square foot (2 tsf) for foundations designed to bear on a subgrade of compacted Structural Fill over undisturbed, natural Sand and Gravel. At this bearing pressure, GZA estimates the total foundation settlement is less than 1 inch and differential settlement is less than ½ inch.

For foundations smaller than 3 feet in least lateral dimension, the structural engineer should reduce the allowable bearing pressure to one-third of the above value multiplied by the least lateral footing dimension in feet. For footings supported on soil, continuous wall footings should be at least 18 inches wide and isolated footings should be at least 36 inches wide.

New footings directly adjacent to existing footings should bear at the same elevation, or the existing footings should be underpinned so they are not undermined. Footings should also bear below a line drawn upward and outward on a 2 horizontal to 1 vertical (2H:1V) slope from the bottom outside edge of any adjacent utility trenches.

For frost protection, the exterior footings in building areas and interior footings in unheated areas should bear at least 4 feet below final exterior grades. Interior footings in heated areas should bear at least 18 inches below the bottom of slab. The contractor should protect footings and floor slabs from freezing temperatures during construction.

PRELIMINARY SEISMIC DESIGN CONSIDERATIONS

A review of the test boring data indicates the soil conditions at the site meet the requirements of Seismic Site Class D in accordance with MSBC 9th edition. Based on spectral accelerations for Malden, Massachusetts presented on Table 1604.11 in the MSBC 9th edition, we estimate the maximum considered earthquake spectral response acceleration for short periods (S_{ms}) is 0.224g (5 percent damping) and at one-second period (S_{m1}) is 0.070g (5 percent critical damping). The structural engineer should calculate the seismic loading on foundation walls and retaining walls based on MSBC Section 1610.2.

GZA also evaluated the site for liquefaction potential during an earthquake. The term "liquefaction" describes a phenomenon in which cohesionless soil experiences a substantial reduction in effective stress during an earthquake and acquires a degree of temporary mobility sufficient to permit substantial settlement and/or loss of bearing capacity. Based on the soil encountered in the explorations, it is GZA's opinion that the soils at the site below the anticipated bearing depth / elevation are not susceptible to liquefaction.

LATERAL EARTH PRESSURES

We recommend calculating the permanent earth pressures for parking level basement walls using equivalent unit weights of 60 pounds per cubic foot (pcf) above the design groundwater depth and 90 pcf below the groundwater depth of 8 feet bgs. GZA can provide a design groundwater depth in a subsequent design-phase geotechnical study based on additional data points via the installation of additional groundwater observation wells. In addition, the structural engineer should design the walls for permanent surcharge load plus any temporary surcharge pressures (such as construction equipment or traffic) and seismic loads. Refer to Section 1113.6.10 of the MSBC for minimum requirements.

TEMPORARY EXCAVATION SUPPORT AND GROUNDWATER CONTROL

During below-grade construction, a temporary lateral earth support system will be required to protect adjacent streets, buildings, and subsurface utilities to remain. Due to the significant excavation depths and the depth of excavation required below groundwater, support of excavation can likely be achieved using sheet piles or using a slurry wall, where both wall types are considered relatively impermeable and can limit groundwater infiltration into the site, provided they are installed to sufficient depth. Sheet pile installation may induce settlement of off-site structures due to construction vibrations produced during installation. To reduce the settlement, we recommend off-setting the sheet piling at least 10 feet from adjacent structures and monitoring adjacent buildings in the vicinity of the support of excavation as discussed below.

Soldier piles and lagging is another excavation support option but may lower groundwater levels outside the site and require considerable off-site disposal of pumped groundwater, given the relatively permeable sand and gravel. Such high flow rate systems can also draw off-site contaminated groundwater, if any, onto the site.

As discussed above, the project team should evaluate temporary dewatering operations that will draw down groundwater levels outside the excavation and the potential effects of lowering groundwater on adjacent property owners. The contractor should maintain groundwater levels outside the excavation as close as possible to pre-construction levels. To limit lowering groundwater levels beyond the limits of construction, the contactor can either utilize a temporary lateral support system designed as a barrier or cutoff wall to limit groundwater infiltration into the excavation, or utilize a series of extraction wells and reinjection wells or a recharge system for the duration of construction dewatering.

If water produced by temporary construction dewatering is not recharged or reinjected, the contractor will need to discharge water off-site via City storm drains or, if approved under an EPA National Pollutant Discharge Elimination System (NPDES) permit, into the Spot Pond Brook culvert. Federal and local agencies will likely require a City water discharge permit and/or a NPDES discharge permit. The discharge permits will likely require periodic monitoring of water quality. They will likely also require particulate treatment by a sedimentation tank. The permits may also require groundwater sampling. GZA has experience applying for these permits and can assist the project team as needed.

The contractor should dewater the excavation to at least 2 feet below excavation level from the time the excavation extends below groundwater level until after the contractor places concrete for the mat and walls and the excavation is watertight. Once the mat and walls have been placed and waterproofed, dewatering pumping can be reduced and the groundwater allowed to return toward normal levels, as long as the dead weight of the building exceeds the upward force from the water pressure, with a factor of safety of 1.3 against flotation (provided the lowest level mat is properly designed against uplift). The structural engineer should analyze the dead weight of the partially constructed building and coordinate the dewatering schedule with the contractor to prevent damage to the partially completed structure.

We anticipate permanent groundwater control will be managed by designing the basement mat slab and walls, including deeper slabs and walls of elevator pits and other depressions in the slab, to resist hydrostatic pressure. Similarly, elevator pistons and their connections should be designed to be watertight and accommodate hydrostatic pressures. Slabs and walls should be waterproofed.

IMPACTS ON EXISTING STRUCTURES

The design team should consider existing foundation and utilities that are to remain in-place, both on-site and on adjacent properties, when planning proposed excavations. The contractor should not undermine or excavate within the zone-of-influence of existing foundations or utilities without consideration for temporary or permanent underpinning of the foundation or utility. The recommended zone-of-influence is an area under a foundation or utility within a line extending downward and out from the edge of the foundation or utility at a 1V:1V slope.

The urban location of the site makes it important to limit the impact of construction on the surrounding residents, businesses, and associated buildings, roads, and utilities. Off-site impacts may be caused by construction-induced vibrations, dewatering activities, and ground surface settlement adjacent to excavation support walls. Possible effects of the excavation to adjacent structures include:

- Settlement adjacent to the excavation support wall due to inward deflection of the wall.
- Settlement and/or cracking of adjacent buildings due to vibration-induced settlement of the sand and gravel deposits supporting the adjacent buildings.
- Settlement and/or cracking of adjacent buildings due to settlement of the sand and gravel deposits caused by construction dewatering.
- Cracking of walls of abutting structures due to vibrations induced from adjacent demolition or the installation of temporary lateral support walls.

A comprehensive geotechnical monitoring program should be performed prior to construction and during below-grade construction activities. The program should include:

- Survey of adjacent building conditions prior to start of construction and monitored throughout construction to detect movement and possible damage;
- Vibration monitoring during demolition and excavation support system installation, and;
- Monitoring of on- and off-site groundwater levels and or piezometers before and during construction.

SOIL MANAGEMENT

GZA collected and analyzed two soil samples for the parameters discussed above. These parameters cover the typical soil receiving facilities that accept soils that meet, and for some contaminants, are below Massachusetts

Contingency Plan (MCP) Reportable Concentration Category RCS-1 (<RCS-1) and Category RCS-2 (<RCS-2). Based on a review of the analytical results, the soil sampled will likely meet the disposal requirements of an RCS-1 facility. However, the fill soils encountered in the upper 10 to 15 feet contains debris, and additional testing may be required for some disposal facilities. The contractor will likely be able to dispose of the natural soils encountered below the fill at an RCS-1 facility or other destination in accordance with the MCP. If construction debris is encountered, it will have to be disposed of as construction and demolition waste.

Disposal facilities will require additional testing to pre-characterize the soil to be excavated. Disposal facilities typically require a testing frequency of one sample per 500 cubic yards of soil. Depending on the facility and testing results, some soil receiving facilities may require a higher testing frequency.

RECOMMENDATIONS FOR FINAL DESIGN PHASE GEOTECHNICAL STUDY

GZA's preliminary geotechnical evaluation, as summarized in the sections above, is based on limited subsurface data collected during GZA's recent preliminary subsurface investigations. Once the project team develops a conceptual development plan with proposed site grading and estimated building loads, a final design phase geotechnical investigation should be performed to evaluate subsurface soil and groundwater conditions within the building footprint, including pre-characterizing soil for disposal. GZA recommends the following minimum scope of work:

- Additional explorations should be completed to meet building code requirements and fill in data gaps. We also recommend installing additional groundwater observation wells to evaluate stabilized groundwater depths for use in excavation support and dewatering evaluations;
- Additional environmental soil pre-characterization sampling for use in evaluating soil disposal options. We also recommend environmental groundwater laboratory testing to evaluate dewatering options; and
- Develop foundation design and site recommendations based on the final geotechnical investigation, site grading, and design plans, including but not limited to the following:
  - Foundation bearing capacity and subgrade modulus;
  - Settlement evaluation based on finalized building loads;
  - Lateral earth pressure recommendations for proposed foundation walls;
  - Seismic design considerations;
  - Temporary and permanent groundwater control, including construction dewatering modeling;
  - Evaluation of on-site soils for potential reuse;
  - Subgrade preparation; and
  - Soil material type, compaction, and placement requirements.

CLOSURE

We appreciate the opportunity to work with you on this project. If you have any questions regarding the recommendations contained in this report or require additional information, please contact us.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Jay L. Hodkinson
Senior Project Manager

Bruce W. Fairless, P.E.
Consultant/Reviewer

David G. Lamothe, P.E.
Associate Principal

JLH/DGL/BWF:
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Attachments: Table 1 – Environmental Laboratory Results
Figure 1 – Locus Plan
Figure 2 –Exploration Plan
Figure 3 – Proposed Conditions Plan
Appendix A – Limitations
Appendix B – GZA Exploration Logs
Appendix C – Geotechnical Laboratory Testing
Appendix D – Environmental Laboratory Testing

TABLE 1 - ENVIRONMENTAL LABORATORY RESULTS SUMMARY
Proposed Commercial Development
15-23 Pleasant Street / 11-19 Dartmouth Street
Malden, Massachusetts

Sample Designation			GZ-1 S-3		GZ-1 S-10	
Sample Date			01/08/2020		01/08/2020	
Sample Depth			0-6 feet		20-30 feet	
Description	**Units**	**Typical RCS-1 Facility**	**Reporting Limits**	**Test Results**	**Reporting Limits**	**Test Results**
MCP Volatile Organics						
1,1,1,2-Tetrachloroethane	mg/kg	0.1	0.0041	U	0.0025	U
1,1,1-Trichloroethane	mg/kg	30	0.0041	U	0.0025	U
1,1,2,2-Tetrachloroethane	mg/kg	0.005	0.0016	U	0.001	U
1,1,2-Trichloroethane	mg/kg	0.1	0.0041	U	0.0025	U
1,1-Dichloroethane	mg/kg	0.4	0.0041	U	0.0025	U
1,1-Dichloroethene	mg/kg	3	0.0041	U	0.0025	U
1,1-Dichloropropene	mg/kg	NE	0.0041	U	0.0025	U
1,2,3-Trichlorobenzene	mg/kg	NE	0.0041	U	0.0025	U
1,2,3-Trichloropropane	mg/kg	100	0.0041	U	0.0025	U
1,2,4-Trichlorobenzene	mg/kg	2	0.0041	U	0.0025	U
1,2,4-Trimethylbenzene	mg/kg	1000	0.0041	0.0074	0.0025	U
1,2-Dibromo-3-Chloropropane	mg/kg	10	0.0041	U	0.0025	U
1,2-Dibromoethane	mg/kg	0.1	0.0041	U	0.0025	U
1,2-Dichlorobenzene	mg/kg	9	0.0041	U	0.0025	U
1,2-Dichloroethane	mg/kg	0.1	0.0041	U	0.0025	U
1,2-Dichloropropane	mg/kg	0.1	0.0041	U	0.0025	U
1,3,5-Trimethylbenzene	mg/kg	10	0.0041	U	0.0025	U
1,3-Dichlorobenzene	mg/kg	3	0.0041	U	0.0025	U
1,3-Dichloropropane	mg/kg	500	0.0041	U	0.0025	U
1,4-Dichlorobenzene	mg/kg	0.7	0.0041	U	0.0025	U
1,4-Dioxane	mg/kg	0.2	0.0813	U	0.05	U
2,2-Dichloropropane	mg/kg	NE	0.0041	U	0.0025	U
2-Butanone	mg/kg	4	0.0081	0.0098	0.005	U
2-Chlorotoluene	mg/kg	100	0.0041	U	0.0025	U
2-Hexanone	mg/kg	100	0.0081	U	0.005	U
4-Chlorotoluene	mg/kg	NE	0.0041	U	0.0025	U
4-Isopropyltoluene	mg/kg	100	0.0041	U	0.0025	U
4-Methyl-2-Pentanone	mg/kg	0.4	0.0081	U	0.005	U
Acetone	mg/kg	6	0.0081	0.0832	0.005	U
Benzene	mg/kg	2	0.0041	U	0.0025	U
Bromobenzene	mg/kg	100	0.0041	U	0.0025	U
Bromochloromethane	mg/kg	NE	0.0041	U	0.0025	U
Bromodichloromethane	mg/kg	0.1	0.0041	U	0.0025	U
Bromoform	mg/kg	0.1	0.0041	U	0.0025	U
Bromomethane	mg/kg	0.5	0.0081	U	0.005	U
Carbon Disulfide	mg/kg	100	0.0041	U	0.0025	U
Carbon Tetrachloride	mg/kg	5	0.0041	U	0.0025	U
Chlorobenzene	mg/kg	1	0.0041	U	0.0025	U
Chloroethane	mg/kg	100	0.0081	U	0.005	U
Chloroform	mg/kg	0.2	0.0041	U	0.0025	U
Chloromethane	mg/kg	100	0.0081	U	0.005	U
cis-1,2-Dichloroethene	mg/kg	0.1	0.0041	U	0.0025	U
cis-1,3-Dichloropropene	mg/kg	0.01	0.0041	U	0.0025	U
Dibromochloromethane	mg/kg	0.005	0.0016	U	0.001	U
Dibromomethane	mg/kg	500	0.0041	U	0.0025	U
Dichlorodifluoromethane	mg/kg	1000	0.0081	U	0.005	U
Diethyl Ether	mg/kg	100	0.0041	U	0.0025	U
Di-isopropyl ether	mg/kg	100	0.0041	U	0.0025	U
Ethyl tertiary-butyl ether	mg/kg	NE	0.0041	U	0.0025	U
Ethylbenzene	mg/kg	40	0.0041	U	0.0025	U
Hexachlorobutadiene	mg/kg	30	0.0041	U	0.0025	U
Isopropylbenzene	mg/kg	1000	0.0041	U	0.0025	U
Methyl tert-Butyl Ether	mg/kg	0.1	0.0041	U	0.0025	U
Methylene Chloride	mg/kg	0.1	0.0081	U	0.005	U
Naphthalene	mg/kg	4	0.0041	0.241E	0.0025	U

Sample Designation			GZ-1 S-3		GZ-1 S-10	
Sample Date			01/08/2020		01/08/2020	
Sample Depth			0-6 feet		20-30 feet	
Description	**Units**	**Typical RCS-1 Facility**	**Reporting Limits**	**Test Results**	**Reporting Limits**	**Test Results**
n-Butylbenzene	mg/kg	100	0.0041	U	0.0025	U
n-Propylbenzene	mg/kg	100	0.0041	U	0.0025	U
sec-Butylbenzene	mg/kg	100	0.0041	U	0.0025	U
Styrene	mg/kg	3	0.0041	U	0.0025	U
tert-Butylbenzene	mg/kg	100	0.0041	U	0.0025	U
Tertiary-amyl methyl ether	mg/kg	NE	0.0041	U	0.0025	U
Tetrachloroethene	mg/kg	1	0.0041	U	0.0025	U
Tetrahydrofuran	mg/kg	500	0.0041	U	0.0025	U
Toluene	mg/kg	30	0.0041	U	0.0025	U
trans-1,2-Dichloroethene	mg/kg	1	0.0041	U	0.0025	U
trans-1,3-Dichloropropene	mg/kg	0.01	0.0041	U	0.0025	U
Trichloroethene	mg/kg	0.3	0.0041	U	0.0025	U
Trichlorofluoromethane	mg/kg	1000	0.0041	U	0.0025	U
Vinyl Chloride	mg/kg	0.7	0.0081	U	0.005	U
Xylene O	mg/kg	100	0.0041	U	0.0025	U
Xylene P,M	mg/kg	100	0.0081	U	0.005	U
Xylenes (Total)	mg/kg	100	0.00813	U	0.005	U
MCP Semivolatile Organics						
1,2,4-Trichlorobenzene	mg/kg	2	0.384	U	0.346	U
1,2-Dichlorobenzene	mg/kg	9	0.384	U	0.346	U
1,3-Dichlorobenzene	mg/kg	3	0.384	U	0.346	U
1,4-Dichlorobenzene	mg/kg	0.7	0.384	U	0.346	U
2,4,5-Trichlorophenol	mg/kg	4	0.384	U	0.346	U
2,4,6-Trichlorophenol	mg/kg	0.7	0.384	U	0.346	U
2,4-Dichlorophenol	mg/kg	0.7	0.384	U	0.346	U
2,4-Dimethylphenol	mg/kg	0.7	0.384	U	0.346	U
2,4-Dinitrophenol	mg/kg	3	1.93	U	1.73	U
2,4-Dinitrotoluene	mg/kg	0.7	0.384	U	0.346	U
2,6-Dinitrotoluene	mg/kg	100	0.384	U	0.346	U
2-Chloronaphthalene	mg/kg	1000	0.384	U	0.346	U
2-Chlorophenol	mg/kg	0.7	0.384	U	0.346	U
2-Methylnaphthalene	mg/kg	0.7	0.384	U	0.346	U
2-Methylphenol	mg/kg	500	0.384	U	0.346	U
2-Nitrophenol	mg/kg	100	0.384	U	0.346	U
3,3´-Dichlorobenzidine	mg/kg	3	0.769	U	0.693	U
3+4-Methylphenol	mg/kg	500	0.769	U	0.693	U
4-Bromophenyl-phenylether	mg/kg	100	0.384	U	0.346	U
4-Chloroaniline	mg/kg	1	0.769	U	0.693	U
4-Nitrophenol	mg/kg	100	1.93	U	1.73	U
Acenaphthene	mg/kg	4	0.384	U	0.346	U
Acenaphthylene	mg/kg	1	0.384	0.456	0.346	U
Acetophenone	mg/kg	1000	0.769	U	0.693	U
Aniline	mg/kg	1000	1.93	U	1.73	U
Anthracene	mg/kg	1000	0.384	0.634	0.346	U
Azobenzene	mg/kg	50	0.384	U	0.346	U
Benzo(a)anthracene	mg/kg	7	0.384	1.33	0.346	U
Benzo(a)pyrene	mg/kg	2	0.193	1.31	0.173	U
Benzo(b)fluoranthene	mg/kg	7	0.384	1.28	0.346	U
Benzo(g,h,i)perylene	mg/kg	1000	0.384	0.767	0.346	U
Benzo(k)fluoranthene	mg/kg	70	0.384	0.986	0.346	U
bis(2-Chloroethoxy)methane	mg/kg	500	0.384	U	0.346	U
bis(2-Chloroethyl)ether	mg/kg	0.7	0.384	U	0.346	U
bis(2-chloroisopropyl)Ether	mg/kg	0.7	0.384	U	0.346	U
bis(2-Ethylhexyl)phthalate	mg/kg	90	0.384	U	0.346	U

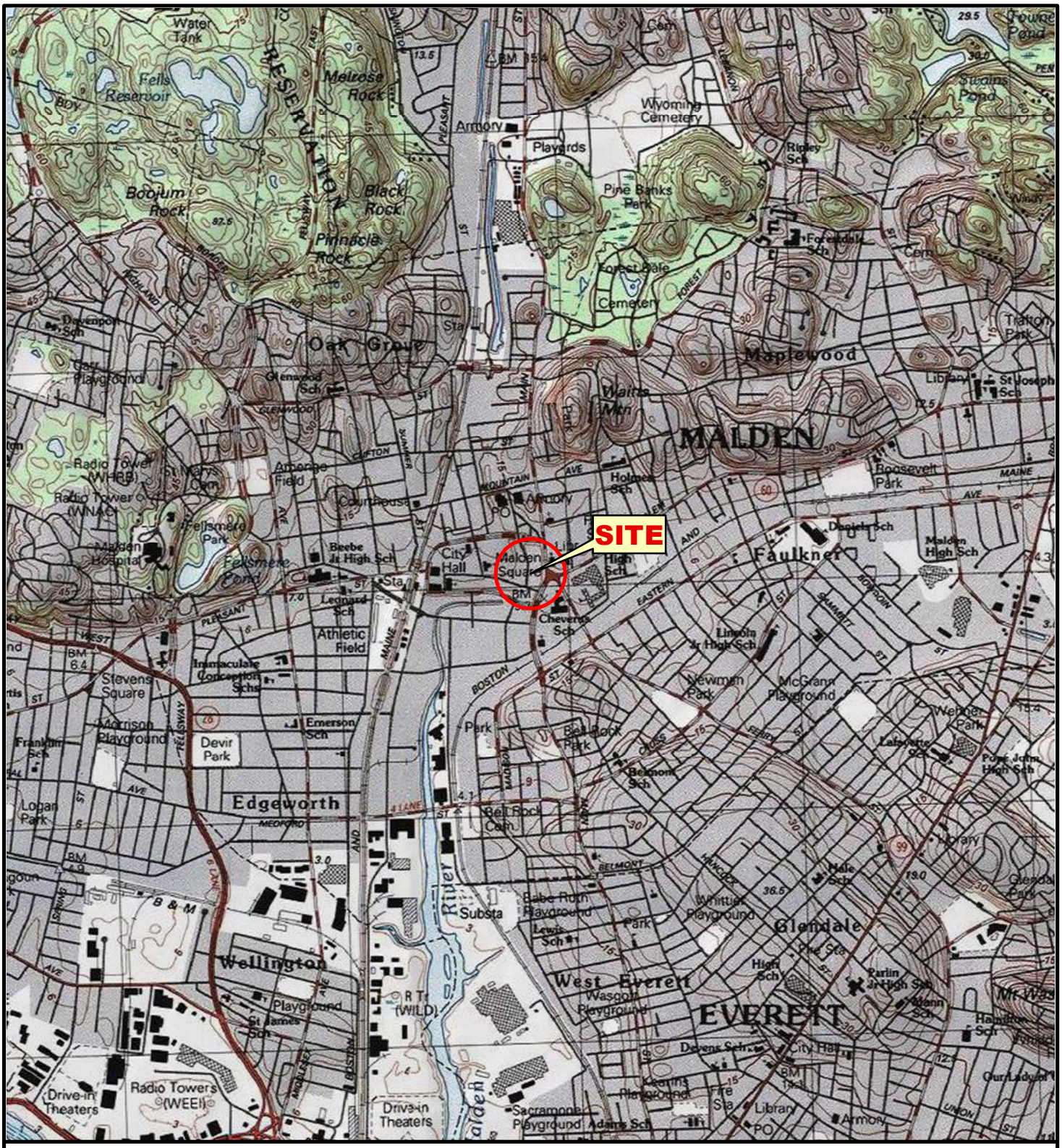
Sample Designation			GZ-1 S-3		GZ-1 S-10	
Sample Date			01/08/2020		01/08/2020	
Sample Depth			0-6 feet		20-30 feet	
Description	**Units**	**Typical RCS-1 Facility**	**Reporting Limits**	**Test Results**	**Reporting Limits**	**Test Results**
Butylbenzylphthalate	mg/kg	100	0.384	U	0.346	U
Chrysene	mg/kg	70	0.193	1.36	0.173	U
Dibenzo(a,h)Anthracene	mg/kg	0.7	0.193	0.341	0.173	U
Dibenzofuran	mg/kg	100	0.384	U	0.346	U
Diethylphthalate	mg/kg	10	0.384	U	0.346	U
Dimethylphthalate	mg/kg	0.7	0.384	U	0.346	U
Di-n-butylphthalate	mg/kg	50	0.384	U	0.346	U
Di-n-octylphthalate	mg/kg	1000	0.384	U	0.346	U
Fluoranthene	mg/kg	1000	0.384	2.65	0.346	U
Fluorene	mg/kg	1000	0.384	0.529	0.346	U
Hexachlorobenzene	mg/kg	0.7	0.384	U	0.346	U
Hexachlorobutadiene	mg/kg	30	0.384	U	0.346	U
Hexachloroethane	mg/kg	0.7	0.384	U	0.346	U
Indeno(1,2,3-cd)Pyrene	mg/kg	7	0.384	0.689	0.346	U
Isophorone	mg/kg	100	0.384	U	0.346	U
Naphthalene	mg/kg	4	0.384	0.415	0.346	U
Nitrobenzene	mg/kg	500	0.384	U	0.346	U
N-Nitrosodimethylamine	mg/kg	50	0.384	U	0.346	U
Pentachlorophenol	mg/kg	3	1.93	U	1.73	U
Phenanthrene	mg/kg	10	0.384	2.30	0.346	U
Phenol	mg/kg	1	0.384	U	0.346	U
Pyrene	mg/kg	1000	0.384	2.58	0.346	U
Petroleum Hydrocarbon Quantitation						
Diesel Range Organics (C10-C28)	mg/kg	NE	32.4	1323	16.1	U
MCP Total Metals						
Antimony	mg/kg	20	4.05	U	4.25	U
Arsenic	mg/kg	20	2.03	5.97	2.13	2.31
Barium	mg/kg	1000	2.03	30.0	2.13	22.1
Beryllium	mg/kg	90	0.09	0.36	0.09	0.23
Cadmium	mg/kg	70	0.41	U	0.43	U
Chromium	mg/kg	100	0.81	22.2	0.85	5.29
Lead	mg/kg	200	4.05	39.6	4.25	U
Mercury	mg/kg	20	0.022	0.144	0.018	U
Nickel	mg/kg	600	2.03	12.8	2.13	5.97
Selenium	mg/kg	400	4.05	U	4.25	U
Silver	mg/kg	100	0.41	U	0.43	U
Thallium	mg/kg	8	4.05	U	0.43	U
Vanadium	mg/kg	400	0.81	22.0	0.85	18.4
Zinc	mg/kg	1000	2.03	48.3	2.13	20.1
MCP Organochlorine Pesticides						
4,4´-DDD	mg/kg	8	0.0029	0.0042	0.0026	U
4,4´-DDE	mg/kg	6	0.0029	U	0.0026	U
4,4´-DDT	mg/kg	6	0.0029	U	0.0026	U
Aldrin	mg/kg	0.08	0.0029	U	0.0026	U
alpha-BHC	mg/kg	50	0.0029	U	0.0026	U
alpha-Chlordane	mg/kg	0.7	0.0029	U	0.0026	U
beta-BHC	mg/kg	10	0.0029	U	0.0026	U
Chlordane (Total)	mg/kg	0.7	0.023	U	0.0211	U
delta-BHC	mg/kg	10	0.0029	U	0.0026	U
Dieldrin	mg/kg	0.08	0.0029	U	0.0026	U
Endosulfan I	mg/kg	0.5	0.0029	U	0.0026	U
Endosulfan II	mg/kg	0.5	0.0029	U	0.0026	U

Sample Designation			GZ-1 S-3		GZ-1 S-10	
Sample Date			01/08/2020		01/08/2020	
Sample Depth			0-6 feet		20-30 feet	
Description	**Units**	**Typical RCS-1 Facility**	**Reporting Limits**	**Test Results**	**Reporting Limits**	**Test Results**
Endosulfan Sulfate	mg/kg	NE	0.0029	U	0.0026	U
Endrin	mg/kg	10	0.0029	U	0.0026	U
Endrin Ketone	mg/kg	NE	0.0029	U	0.0026	U
gamma-BHC (Lindane)	mg/kg	0.003	0.0017	U	0.0016	U
gamma-Chlordane	mg/kg	0.7	0.0029	U	0.0026	U
Heptachlor	mg/kg	0.3	0.0029	U	0.0026	U
Heptachlor Epoxide	mg/kg	0.1	0.0029	U	0.0026	U
Hexachlorobenzene	mg/kg	0.7	0.0029	U	0.0026	U
Methoxychlor	mg/kg	200	0.0029	U	0.0026	U
MCP Polychlorinated Biphenyls						
Aroclor 1016	mg/kg	1	0.06	U	0.06	U
Aroclor 1221	mg/kg	1	0.06	U	0.06	U
Aroclor 1232	mg/kg	1	0.06	U	0.06	U
Aroclor 1242	mg/kg	1	0.06	U	0.06	U
Aroclor 1248	mg/kg	1	0.06	U	0.06	U
Aroclor 1254	mg/kg	1	0.06	U	0.06	U
Aroclor 1260	mg/kg	1	0.06	U	0.06	U
Aroclor 1262	mg/kg	1	0.06	U	0.06	U
Aroclor 1268	mg/kg	1	0.06	U	0.06	U
MCP Chlorinated Herbicides						
2,4,5-T	mg/kg	100	0.011	U	0.01	U
2,4,5-TP (Silvex)	mg/kg	100	0.011	U	0.01	U
2,4-D	mg/kg	100	0.052	U	0.051	U
2,4-DB	mg/kg	100	0.053	U	0.051	U
Dalapon	mg/kg	1000	0.051	U	0.049	U
Dicamba	mg/kg	500	0.01	U	0.01	U
Dichlorprop	mg/kg	NE	0.052	U	0.051	U
Dinoseb	mg/kg	500	0.053	U	0.051	U
MCPA	mg/kg	100	2.58	U	2.51	U
MCPP	mg/kg	NE	2.61	#U	2.54	#U
General Chemistry						
Conductivity	umhos/cm	NE	WL	581	WL	182
Corrosivity (pH)	S.U.	NE	WL	8.8	WL	7.93
Flashpoint	°F	NE	200	>	200	>
Reactive Cyanide	mg/kg	NE	2	U	2	U
Reactive Sulfide	mg/kg	NE	2	U	2	U
Redox Potential	mv	NE	WL	203	WL	209

Legend

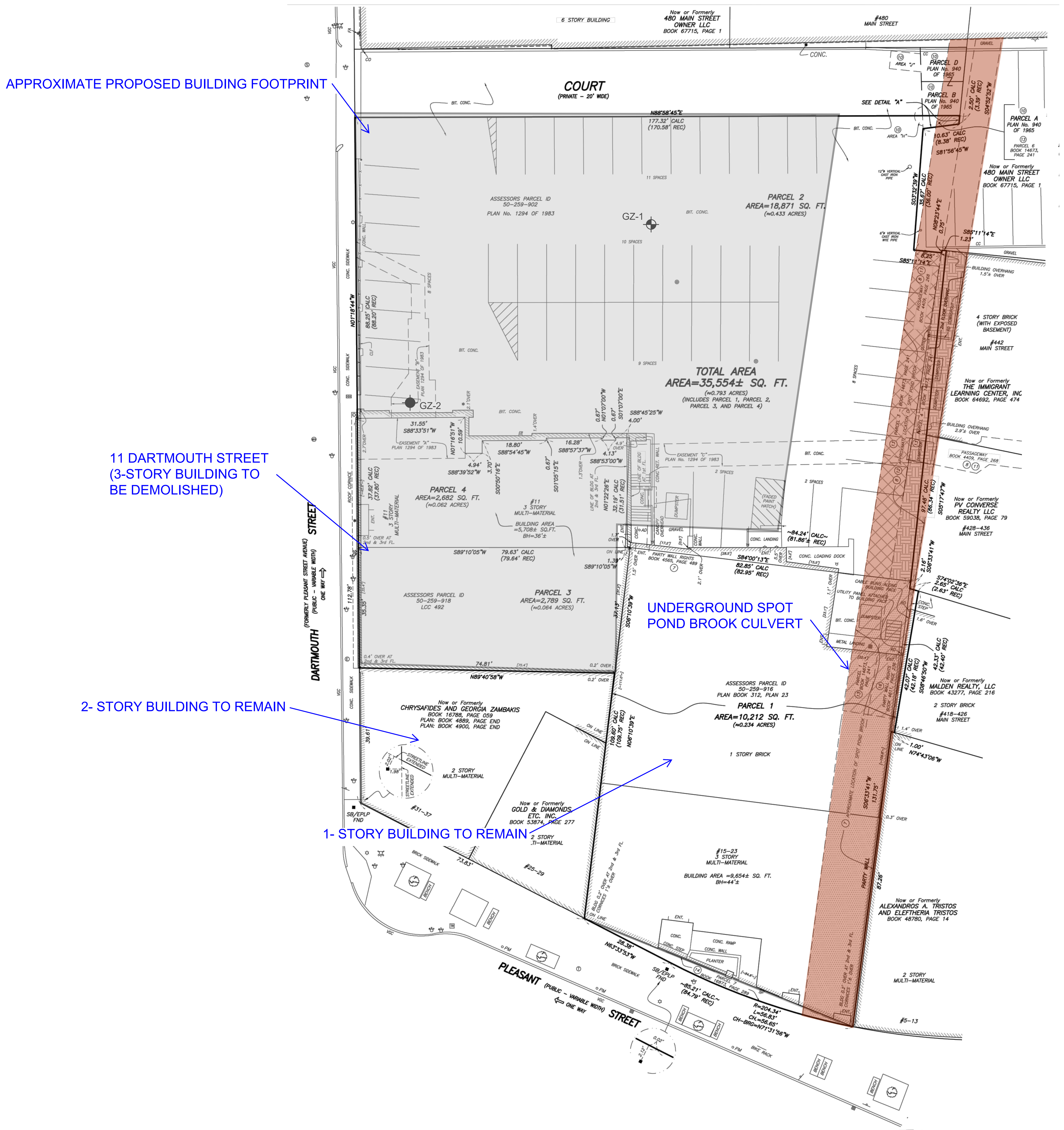
U Undetected
E Reported above the quantitation limit; Estimated value (E).
D Diluted
Modified result
WL Results obtained from a deionized water leach of the sample.
> Greater than.

Figures



SOURCE : USGS TOPOGRAPHIC QUADRANGLES SCANNED BY THE NATIONAL GEOGRAPHIC SOCIETY & I-CUBED, COPYRIGHT 2011

GZA	PROJ. MGR.: JLH DESIGNED BY: JTS REVIEWED BY: JLH OPERATOR: JTS DATE: 01-03-2020	LOCUS SHOWING 500 FOOT OFFSET	JOB NO. 04.0191051.00
		PROPOSED DEVELOPMENT 17 DARTMOUTH STREET MALDEN, MASSACHUSETTS	FIGURE NO. 1



GENERAL NOTES

1. BASE PLAN WAS DEVELOPED FROM A PLAN ENTITLED "ALTA/NSPS LAND TITLE SURVEY 15–23 PLEASANT STREET AND 11–19 DARTMOUTH STREET, 7 DARTMOUTH STREET, 9 DARTMOUTH STREET, MALDEN, MASSACHUSETTS", DATED SEPTEMBER 25, 2019 BY FELDMAN LAND SURVEYORS OF BOSTON, MASSACHUSETTS.
2. LOCATIONS OF TEST BORINGS WERE APPROXIMATELY DETERMINED BY USING TAPE TIES FROM EXISTING STRUCTURES. THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
3. GZA TEST BORINGS WERE DRILLED BY NEW ENGLAND BORING CONTRACTORS OF DERRY, NEW HAMPSHIRE DURING THE PERIOD BETWEEN JANUARY 8, 2020 AND JANUARY 10, 2020 AND WERE OBSERVED AND LOGGED BY GZA PERSONNEL.

LEGEND

GZ-1 TEST BORING DESIGNATION AND LOCATION

GZ-2 MONITORING WELL DESIGNATION AND LOCATION

N W E S

0 10 20 40 60

1" = 20'

PROPOSED DEVELOPMENT
17 DARTMOUTH STREET
MALDEN, MASSCHUSETTS

EXPLORATION PLAN

PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		QUAKER LANE CAPITAL	
PROJ MGR: JLH	REVIEWED BY: JLH	CHECKED BY: DGL	FIGURE 2 SHEET NO.
DESIGNED BY: JLH	DRAWN BY: MR	SCALE: 1" = 20'-0"	
DATE: FEBRUARY, 2020	PROJECT NO. 04.0191051.00	REVISION NO. 0	

GENERAL NOTES

1. BASE PLAN WAS DEVELOPED FROM A PLAN ENTITLED "SITE PLAN", CREATED BY THE GENSLER AND RECEIVED ON JANUARY 03, 2020.

N
W E
S

0 20 40 80
SCALE IN FEET

PROPOSED DEVELOPMENT
17 DARTMOUTH STREET
MALDEN, MASSACHUSETTS

PROPOSED CONDITIONS PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: QUAKER LANE CAPITAL	
PROJ MGR: JLH	REVIEWED BY: JLH	CHECKED BY: DGL	FIGURE 3
DESIGNED BY: JLH	DRAWN BY: MR	SCALE: 1" = 40'-0"	
DATE: FEBRUARY, 2020	PROJECT NO. 04.0191051.00	REVISION NO. 0	SHEET NO. # OF ##

Appendix A – Limitations

USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the contract documents, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in Proposal for Services and/or Report, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. If conditions other than those described in this report are found at the subject location(s), or the design has been altered in any way, GZA shall be so notified and afforded the opportunity to revise the report, as appropriate, to reflect the unanticipated changed conditions .

3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

SUBSURFACE CONDITIONS

5. The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.

6. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein which were made available to GZA at the time of our evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.

7. Water level readings have been made in test holes (as described in this Report) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The water table encountered in the course of the work may differ from that indicated in the Report.

8. GZA's services did not include an assessment of the presence of oil or hazardous materials at the property. Consequently, we did not consider the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities, or the use of structures on the property.

9. Recommendations for foundation drainage, waterproofing, and moisture control address the conventional geotechnical engineering aspects of seepage control. These recommendations may not preclude an environment that allows the infestation of mold or other biological pollutants.

COMPLIANCE WITH CODES AND REGULATIONS

10. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.

COST ESTIMATES

11. Unless otherwise stated, our cost estimates are only for comparative and general planning purposes. These estimates may involve approximate quantity evaluations. Note that these quantity estimates are not intended to be sufficiently accurate to develop construction bids, or to predict the actual cost of work addressed in this Report. Further, since we have no control over either when the work will take place or the labor and material costs required to plan and execute the anticipated work, our cost estimates were made by relying on our experience, the experience of others, and other sources of readily available information. Actual costs may vary over time and could be significantly more, or less, than stated in the Report.

SCREENING AND ANALYTICAL TESTING

12. We collected environmental samples at the locations identified in the Report. These samples were analyzed for the specific parameters identified in the report. Additional constituents, for which analyses were not conducted, may be present in soil, groundwater, surface water, sediment and/or air. Future Site activities and uses may result in a requirement for additional testing.

13. Our interpretation of field screening and laboratory data is presented in the Report. Unless otherwise noted, we relied upon the laboratory's QA/QC program to validate these data.

14. Variations in the types and concentrations of contaminants observed at a given location or time may occur due to release mechanisms, disposal practices, changes in flow paths, and/or the influence of various physical, chemical, biological or radiological processes. Subsequently observed concentrations may be other than indicated in the Report.

ADDITIONAL SERVICES

15. GZA recommends that we be retained to provide services during any future: site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

Appendix B – GZA Exploration Logs

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Quaker Lane Capital
17 Dartmouth Street
Malden, Massachusetts

EXPLORATION NO.: GZ-1
SHEET: 1 of 1
PROJECT NO: 04.0191051.00
REVIEWED BY: JLH

Logged By: K. Kleyensteuber
Drilling Co.: New England Boring Contractors
Foreman: Brad Enos

Type of Rig: Truck
Rig Model: Mobile
Drilling Method: Drive and Wash

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 30
Date Start - Finish: 1/8/2020 - 1/8/2020

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

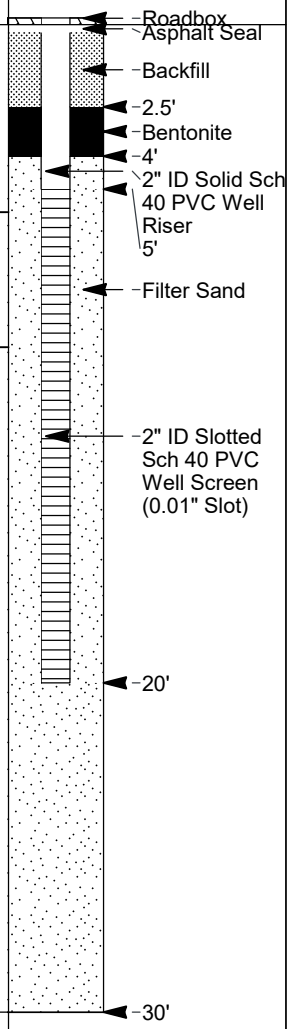
Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
1/8/2020	1225	8.7	15 min.
1/9/2020	1230	8.8	24 hrs.
1/29/2020	1500	8.9	

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data
		S-1	0-2	24	16	16 34 16 11	50	S-1: Very dense, brown, GRAVEL and fine to coarse Sand, trace Silt, dry.	1	0.1
		S-2	2-4	24	15	6 5 2 4	7	S-2: Loose, olive/gray, fine SAND and Clayey Silt, little Gravel, dry.		0.1
5		S-3	4-5.75	21	16	19 16 15 50	31	S-3: Dense, brown, fine to medium SAND, some Gravel, trace Silt, dry.	2	0.1
10		S-4	10-12	24	7	13 9 11 7	20	S-4: Medium dense, brown/gray, GRAVEL, some fine to medium Sand, some Silt, wet.		0.4
		S-5	12-14	24	0	9 8 6 8	14	S-5: No recovery.		
15		S-6	14-16	24	6	7 7 7 6	14	S-6: Medium dense, brown, GRAVEL and medium to coarse Sand, some Silt, wet.		0.1
		S-7	16-18	24	0	5 5 4 7	9	S-7: No recovery.		
		S-8	18-20	24	0	7 7 6 8	13	S-8: No recovery.		
20		S-9	20-22	24	0	5 4 5 6	9	S-9: No recovery.	3	
		S-10	22-24	24	9	7 6 6 7	12	S-10: Medium dense, brown, SAND and Gravel, little Silt, wet.	4	0.2
25		S-11	24-26	24	0	4 10 8 5	18	S-11: No recovery.		
		S-12	26-28	24	0	5 5 6 5	11	S-12: No recovery.		
		S-13	28-30	24	4	5 7 6 7	13	S-13: No recovery.		
30								End of exploration at 30 feet.		
35										

Depth (ft.)	Stratum Description	Elev. (ft.)
5.7	FILL	
9.8	CONCRETE FOUNDATION	
30	SAND AND GRAVEL	



REMARKS

1 - Soil samples were screened for total volatile organic compounds (VOCs) using a MiniRae2000 photoionization detector referenced to an isobutylene-in-air standard. Total VOCs detected are reported in parts per million (ppm) in the "Field Test Data" column. "ND" indicates no VOCs detected.
2 - Drilled through probable concrete debris.
3 - S-9: Sampled with a 3-inch split spoon after no recovery with 2-inch split spoon.
4 - S-10: Sampled with 3-inch split spoon, after no recovery with 2-inch split spoon.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: GZ-1

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Quaker Lane Capital
17 Dartmouth Street
Malden, Massachusetts

EXPLORATION NO.: GZ-2
SHEET: 1 of 3
PROJECT NO: 04.0191051.00
REVIEWED BY: JLH

Logged By: K. Kleyensteuber
Drilling Co.: New England Boring Contractors
Foreman: Brad Enos

Type of Rig: Truck
Rig Model: Mobile
Drilling Method: Drive and Wash

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 99.5
Date Start - Finish: 1/9/2020 - 1/10/2020

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-1	0.5-2	18	10	7 7 8 25	15	S-1: Medium dense, brown/olive, fine to medium SAND, little Gravel, some Silt, dry.					No Equipment Installed
		S-2	2-4	24	8	8 5 3 3	8						
5		S-3	4-6	24	12	2 2 2 2	4	S-2: Medium stiff, olive, Clayey SILT, some Gravel, some fine to medium Sand, trace Asphalt, moist.				FILL	
		S-4	6-8	24	10	2 3 3 4	6						
		S-5A	8-10	24	8	4 5 5 4	10	S-3: Soft, brown, SILT & CLAY and fine to coarse Sand, little Gravel, moist.					
10		S-5B	10-12	24	8	4 5 5 4	10	S-4: Medium stiff, olive, Clayey SILT, little Gravel, some fine to medium Sand, moist.			9.6		
								S-5A: Medium stiff, olive,					
15		S-6	14-16	24	5	15 9 9 15	18	Clayey SILT, little Gravel, some fine to medium Sand.				FILL WITH DEBRIS	
								S-5B: Loose, dark brown, fine to medium SAND and Silt, some Concrete, little Brick.					
								S-6: Medium dense, gray,			19		
20		S-7	19-21	24	13	4 3 3 2	6	GRAVEL and Concrete, little Sand, trace Silt, trace Wood, wet.					
								S-7: Loose, light brown, fine SAND, trace Gravel, little Silt, wet.					
25		S-8	24-26	24	18	3 5 6 9	11	S-8: Medium dense, light brown, fine to medium SAND, trace Gravel, little Silt, wet.	1			SAND AND GRAVEL	
30		S-9	29-31	24	8	3 13 11 14	24	S-9: Medium dense, orange/light brown, GRAVEL and fine Sand, little Silt, wet.					
35		S-10	34-36	24	8	6 5	16	S-10: Medium dense, light					

REMARKS

1 - S-8: No recovery with 2-inch split spoon. Used 3-inch split spoon to obtain sample.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: GZ-2

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Quaker Lane Capital
17 Dartmouth Street
Malden, Massachusetts

EXPLORATION NO.: GZ-2
SHEET: 2 of 3
PROJECT NO: 04.0191051.00
REVIEWED BY: JLH

Logged By: K. Kleyensteuber
Drilling Co.: New England Boring Contractors
Foreman: Brad Enos

Type of Rig: Truck
Rig Model: Mobile
Drilling Method: Drive and Wash

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 99.5
Date Start - Finish: 1/9/2020 - 1/10/2020

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
						11 16		brown, fine to medium SAND, some Silt, little Gravel, wet.					
40		S-11	39-41	24	4	8 9 9 13	18	S-11: Medium dense, light brown/gray, GRAVEL, some fine to medium SAND, little Silt, wet.					
45		S-12	44-46	24	13	3 3 5 8	8	S-12: Loose, light brown/orange, fine to medium SAND, trace Gravel, trace Silt, wet.					
50		S-13	49-51	24	11	6 3 6 6	9	S-13: Loose, light brown, fine to medium SAND, little Gravel, little Silt, wet.				SAND AND GRAVEL	
55		S-14	54-56	24	8	7 9 11 13	20	S-14: Medium dense, light brown, fine to medium SAND, some Gravel, little Silt, wet.					
60		S-15	59-61	24	0	8 30 28 23	58	S-15: No recovery.					
65		S-16	64-66	24	6	9 9 13 11	22	S-16: Medium dense, brown, GRAVEL, some fine to coarse Sand, little Silt, wet.					
70		S-17	69-71	24	10	8 13	27	S-17: Medium dense, brown,					

REMARKS

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: GZ-2

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Quaker Lane Capital
17 Dartmouth Street
Malden, Massachusetts

EXPLORATION NO.: GZ-2
SHEET: 3 of 3
PROJECT NO: 04.0191051.00
REVIEWED BY: JLH

Logged By: K. Kleyensteuber
Drilling Co.: New England Boring Contractors
Foreman: Brad Enos

Type of Rig: Truck
Rig Model: Mobile
Drilling Method: Drive and Wash

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 99.5
Date Start - Finish: 1/9/2020 - 1/10/2020

H. Datum:
V. Datum:

Hammer Type: Automatic Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size:

Groundwater Depth (ft.)			
Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
						14 16		fine to coarse SAND and Gravel, little Silt, wet.					
75		S-18	74-76	24	8	12 23 17 19	40	S-18: Dense, brown, fine to medium SAND and Gravel, some Silt, wet.					
80		S-19	79-81	24	8	17 11 15 16	26	S-19: Medium dense, brown, GRAVEL and fine to medium Sand, little Silt, wet.					
85		S-20	84-86	24	9	16 15 16 19	31	S-20: Dense, brown, fine to coarse SAND and Gravel, little Silt, wet.				SAND AND GRAVEL	
90		S-21	89-91	24	3	13 14 12 11	26	S-21: Medium dense, brown, fine to medium SAND, some Gravel, little Silt, wet.					
95		S-22	94-96	24	10	11 15 17 15	32	S-22: Dense, brown, fine to medium SAND and Gravel, little Silt, wet.					
100		S-23	99-99.5	6	6	100/6"	R	S-23: Very dense, brown, fine to medium SAND, little Silt, trace Gravel, wet.			99.5		
								End of exploration at 99.5 feet.					
105													

REMARKS

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: GZ-2

Appendix C – Geotechnical Laboratory Testing

THIELSCH ENGINEERING
195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
thielsch.com
Let's Build a Solid Foundation

Client Information:
GZA GeoEnvironmental
Bedford, NH
PM: J. Hodkinson
Assigned By: JLH
Collected By: K. Kleyensteuber

Project Information:
17 Dartmouth Street Building
Malden, MA
GZA Project Number: 04.0191051.00
Summary Page: 1 of 1
Report Date: 02.03.2020

LABORATORY TESTING DATA SHEET, Report No.: 7420-A-155

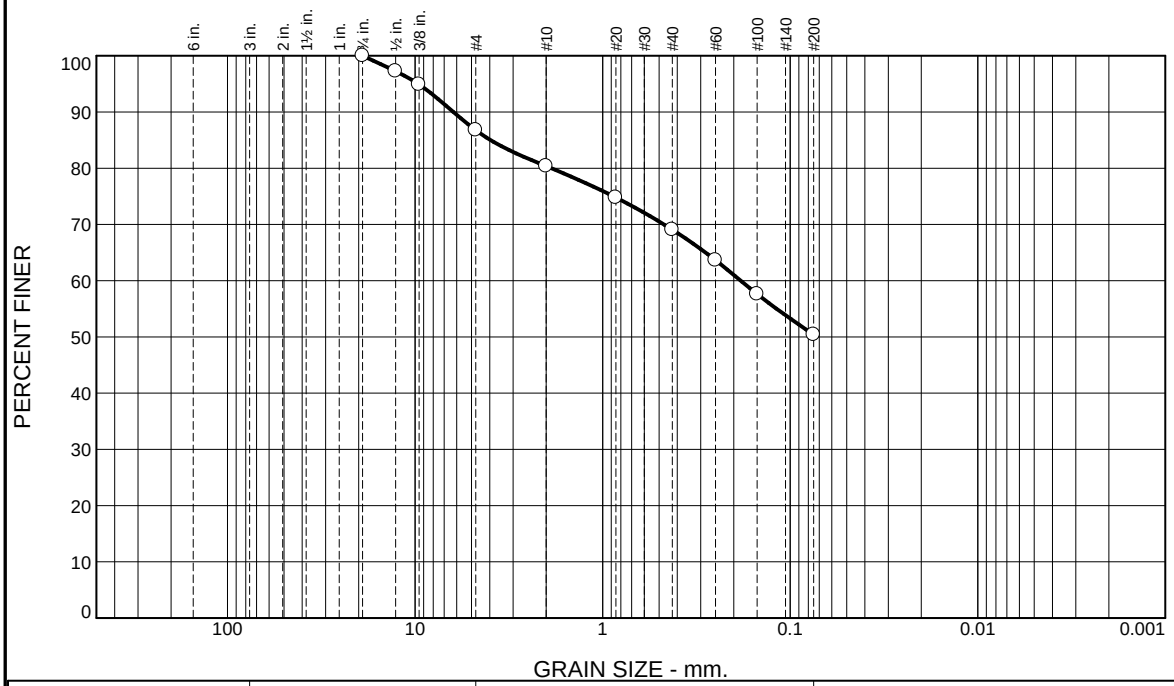
Boring No.	Sample No.	Depth (Ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	G_s	Dry unit wt. pcf	Test Water Content %	γ_d MAX (pcf) / W_{opt} (%)	γ_d MAX (pcf) / W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	
				D2216	D4318		D6913			D2974	D854			D1557						
GZ-2	S-3	4-6	20-S-309				13.2	36.4	50.4											Brown SILT & CLAY and f-c SAND, little fine Gravel
GZ-2	S-7	19-21	20-S-310				1.7	86.6	11.7											Brown fine SAND, little Silt, trace fine Gravel
GZ-2	S-10	34-36	20-S-311				14.1	61.9	24.0											Brown f-m SAND, some Silt, little f-c Gravel

Date Received: *01.30.2020*

Reviewed By:

Date Reviewed: *02.04.2020*

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	13.2	6.4	11.3	18.7	50.4	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	97.2		
0.375"	94.9		
#4	86.8		
#10	80.4		
#20	74.8		
#40	69.1		
#60	63.6		
#100	57.6		
#200	50.4		

* (no specification provided)

Material Description

Brown SILT & CLAY and f-c SAND, little fine Gravel

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 6.2472 D_{85}= 3.9522 D_{60}= 0.1836
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as plastic. Sample rolled to 1/8".

Date Received: 01.30.2020 **Date Tested:** 02.03.2020

Tested By: IA / MN

Checked By: Rebecca Roth

Title: Laboratory Coordinator

Source of Sample: Boring **Depth:** 4-6' **Date Sampled:**
Sample Number: GZ-2 / S-3

Thielsch Engineering Inc.

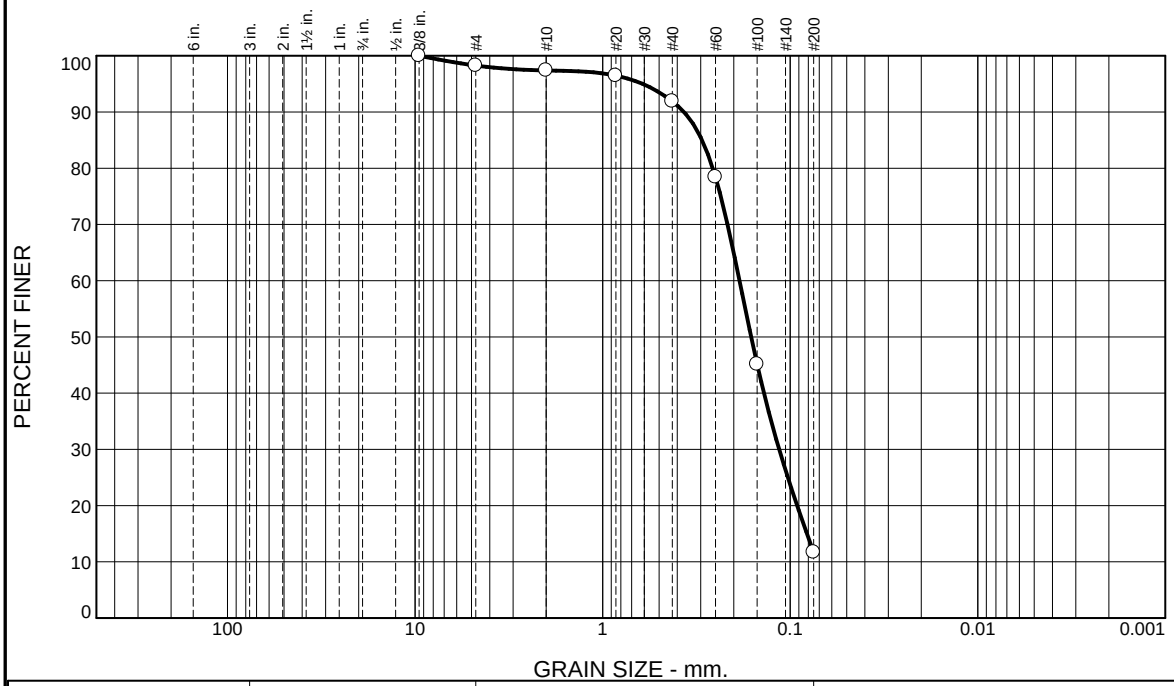
Cranston, RI

Client: GZA GeoEnvironmental

Project: 17 Dartmouth Street Development
Malden, MA

Project No: 04.0191051.00 **Figure** 20-S-309

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.7	0.9	5.5	80.2	11.7	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.375"	100.0		
#4	98.3		
#10	97.4		
#20	96.5		
#40	91.9		
#60	78.4		
#100	45.1		
#200	11.7		

* (no specification provided)

Material Description

Brown fine SAND, little Silt, trace fine Gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 0.3682 D_{85}= 0.2951 D_{60}= 0.1862
D_{50}= 0.1614 D_{30}= 0.1145 D_{15}= 0.0814
D_{10}= C_u= C_c=

Remarks

Sample contained standing water as recieved.

Date Received: 01.30.2020 **Date Tested:** 02.03.2020

Tested By: IA / MN

Checked By: Rebecca Roth

Title: Laboratory Coordinator

Source of Sample: Boring **Depth:** 19-21' **Date Sampled:**
Sample Number: GZ-2 / S-7

Thielsch Engineering Inc.

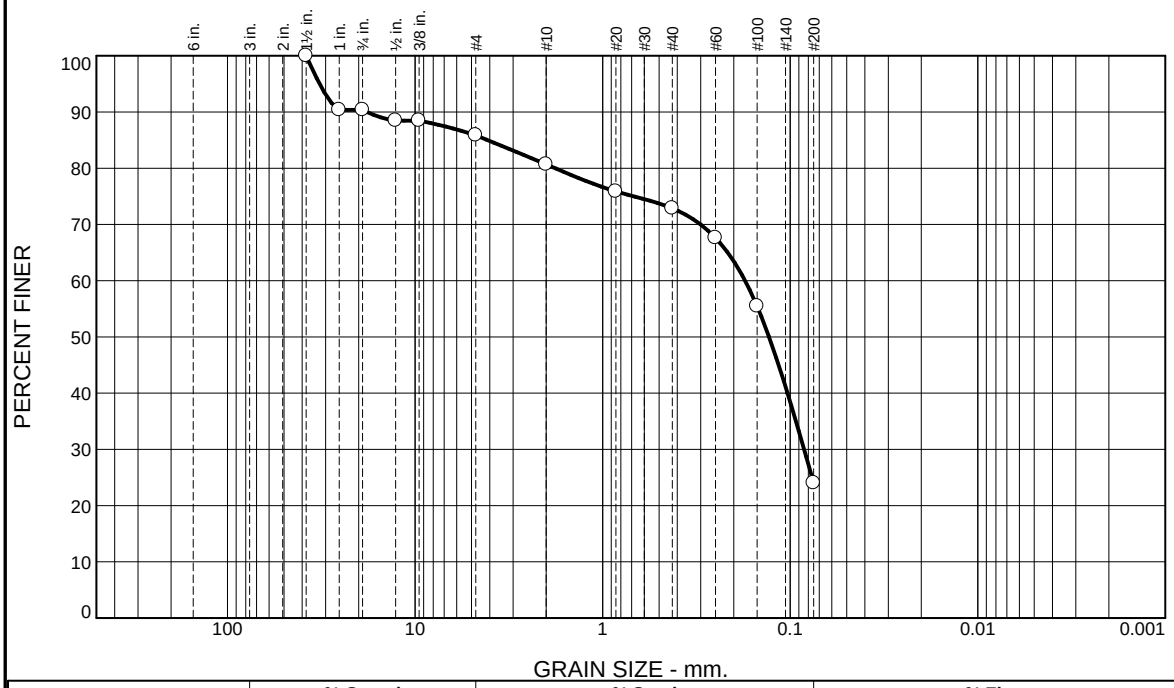
Cranston, RI

Client: GZA GeoEnvironmental

Project: 17 Dartmouth Street Development
Malden, MA

Project No: 04.0191051.00 **Figure** 20-S-310

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.6	4.5	5.2	7.8	48.9	24.0	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0		
1"	90.4		
3/4"	90.4		
1/2"	88.5		
3/8"	88.5		
#4	85.9		
#10	80.7		
#20	75.9		
#40	72.9		
#60	67.6		
#100	55.5		
#200	24.0		

* (no specification provided)

Material Description

Brown f-m SAND, some Silt, little f-c Gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 18.0565 D_{85}= 4.1018 D_{60}= 0.1739
D_{50}= 0.1297 D_{30}= 0.0844 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 01.30.2020 **Date Tested:** 02.03.2020

Tested By: IA / MN

Checked By: Rebecca Roth

Title: Laboratory Coordinator

Source of Sample: Boring **Depth:** 34-36' **Date Sampled:**

Sample Number: GZ-2 / S-10

Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental

Project: 17 Dartmouth Street Development
Malden, MA

Project No: 04.0191051.00 **Figure** 20-S-311

Appendix D – Environmental Laboratory Testing

CERTIFICATE OF ANALYSIS

Jay Hodkinson
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Malden 2 - Dartmouth Street (04.0191051.00)
ESS Laboratory Work Order Number: 20A0294

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:11 pm, Jan 20, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

SAMPLE RECEIPT

The following samples were received on January 13, 2020 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Question I: All samples for EPH were analyzed for a subset of the required MCP list per the client's request.

All Samples for LL VOA were received outside of the holding time.

Lab Number	Sample Name	Matrix	Analysis
20A0294-01	GZ-1 S-3	Soil	1010, 2580, 6010C, 7.3.3.2, 7.3.4.1, 7471B, 8015C, 8081B, 8082A, 8151A, 8260B, 8260B Low, 8270D, 9045, 9050A
20A0294-02	GZ-1 S-10	Soil	1010, 2580, 6010C, 6020A, 7.3.3.2, 7.3.4.1, 7471B, 8015C, 8081B, 8082A, 8151A, 8260B Low, 8270D, 9045, 9050A

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street ESS Laboratory Work Order: 20A0294

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

20A0294-01	**Reported above the quantitation limit; Estimated value (E).**
	Naphthalene
C0A0209-CCV1	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	2,2-Dichloropropane (27% @ 20%)
CA01454-BS1	**Blank Spike recovery is below lower control limit (B-).**
	1,2-Dibromo-3-Chloropropane (66% @ 70-130%)

5035/8260B Volatile Organic Compounds / Methanol

20A0294-01	**Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
	1,2-Dichloroethane-d4 (142% @ 70-130%), 4-Bromofluorobenzene (142% @ 70-130%), Dibromofluoromethane (148% @ 70-130%), Toluene-d8 (146% @ 70-130%)
C0A0207-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Trichlorofluoromethane (24% @ 20%)
C0A0207-CCV1	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	1,4-Dioxane - Screen (35% @ 20%), Chloromethane (21% @ 20%)
CA01453-BSD1	**Blank Spike recovery is below lower control limit (B-).**
	1,4-Dioxane - Screen (0% @ 44-241%)

8151A Chlorinated Herbicides

20A0294-01	**Modified result**
	MCPP
20A0294-01	**Peaks found in the retention time window for MCPP did not confirm by GC/MS.**
20A0294-02	**Modified result**
	MCPP
20A0294-02	**Peaks found in the retention time window for MCPP did not confirm by GC/MS.**

8270D Semi-Volatile Organic Compounds

C0A0190-CCV1	**Calibration required quadratic regression (Q).**
	2,4-Dinitrophenol (102% @ 80-120%)
C0A0190-CCV1	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Azobenzene (28% @ 20%), Phenanthrene (21% @ 20%)
C0A0218-CCV1	**Calibration required quadratic regression (Q).**
	2,4-Dinitrophenol (108% @ 80-120%)
C0A0218-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	2,4-Dinitrotoluene (21% @ 20%), 4-Chloroaniline (21% @ 20%)
CA01347-BS1	**Blank Spike recovery is below lower control limit (B-).**
	4-Chloroaniline (38% @ 40-140%)
CA01347-BSD1	**Blank Spike recovery is below lower control limit (B-).**
	4-Chloroaniline (30% @ 40-140%)

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **20A0294-01 through 20A0294-02**

Matrices: ( ) Ground Water/Surface Water (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

(X) 8260 VOC CAM II A	(X) 7470/7471 Hg CAM III B	( ) MassDEP VPH (GC/PID/FID) CAM IV A	(X) 8082 PCB CAM V A	( ) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
(X) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV C	(X) 8081 Pesticides CAM V B	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
(X) 6010 Metals CAM III A	(X) 6020 Metals CAM III D	(X) MassDEP EPH CAM IV B	(X) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (X) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for "'Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes (X) No ( )*
	***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

****All negative responses must be addressed in an attached laboratory narrative.***

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: Laurel Stoddard Date: January 20, 2020

Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (4.05)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378
Arsenic	**5.97** (2.03)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378
Barium	**30.0** (2.03)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378
Beryllium	**0.36** (0.09)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378
Cadmium	ND (0.41)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378
Chromium	**22.2** (0.81)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378
Lead	**39.6** (4.05)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378
Mercury	**0.144** (0.022)		7471B		1	MKS	01/15/20 8:58	1.01	40	CA01379
Nickel	**12.8** (2.03)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378
Selenium	ND (4.05)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378
Silver	ND (0.41)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378
Thallium	ND (4.05)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378
Vanadium	**22.0** (0.81)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378
Zinc	**48.3** (2.03)		6010C		1	KJK	01/14/20 18:26	2.77	100	CA01378

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 6.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,1,1-Trichloroethane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,1,2,2-Tetrachloroethane	ND (0.0016)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,1,2-Trichloroethane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,1-Dichloroethane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,1-Dichloroethene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,1-Dichloropropene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,2,3-Trichlorobenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,2,3-Trichloropropane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,2,4-Trichlorobenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,2,4-Trimethylbenzene	**0.0074** (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,2-Dibromo-3-Chloropropane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,2-Dibromoethane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,2-Dichlorobenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,2-Dichloroethane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,2-Dichloropropane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,3,5-Trimethylbenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,3-Dichlorobenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,3-Dichloropropane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,4-Dichlorobenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
1,4-Dioxane	ND (0.0813)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
2,2-Dichloropropane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
2-Butanone	**0.0098** (0.0081)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
2-Chlorotoluene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
2-Hexanone	ND (0.0081)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
4-Chlorotoluene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
4-Isopropyltoluene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
4-Methyl-2-Pentanone	ND (0.0081)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Acetone	**0.0832** (0.0081)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Benzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Bromobenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Bromochloromethane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 6.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Bromoform	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Bromomethane	ND (0.0081)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Carbon Disulfide	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Carbon Tetrachloride	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Chlorobenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Chloroethane	ND (0.0081)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Chloroform	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Chloromethane	ND (0.0081)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
cis-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
cis-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Dibromochloromethane	ND (0.0016)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Dibromomethane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Dichlorodifluoromethane	ND (0.0081)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Diethyl Ether	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Di-isopropyl ether	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Ethyl tertiary-butyl ether	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Ethylbenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Hexachlorobutadiene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Isopropylbenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Methyl tert-Butyl Ether	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Methylene Chloride	ND (0.0081)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Naphthalene	**E 0.241** (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
n-Butylbenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
n-Propylbenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
sec-Butylbenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Styrene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
tert-Butylbenzene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Tertiary-amyl methyl ether	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Tetrachloroethene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Tetrahydrofuran	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Toluene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 6.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
trans-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Trichloroethene	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Trichlorofluoromethane	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Vinyl Chloride	ND (0.0081)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Xylene O	ND (0.0041)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Xylene P,M	ND (0.0081)		8260B Low		1	01/14/20 14:53	C0A0209	CA01454
Xylenes (Total)	ND (0.00813)		8260B Low		1	01/14/20 14:53		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*114 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*95 %*		*70-130*
Surrogate: Dibromofluoromethane	*104 %*		*70-130*
Surrogate: Toluene-d8	*98 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 19.1
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,1,1-Trichloroethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,1,2,2-Tetrachloroethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,1,2-Trichloroethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,1-Dichloroethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,1-Dichloroethene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,1-Dichloropropene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,2,3-Trichlorobenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,2,3-Trichloropropane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,2,4-Trichlorobenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,2,4-Trimethylbenzene	**0.277** (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,2-Dibromo-3-Chloropropane	ND (1.00)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,2-Dibromoethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,2-Dichlorobenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,2-Dichloroethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,2-Dichloropropane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,3,5-Trimethylbenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,3-Dichlorobenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,3-Dichloropropane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,4-Dichlorobenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
1,4-Dioxane - Screen	ND (40.1)		8260B		1	01/14/20 16:16	C0A0207	CA01453
2,2-Dichloropropane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
2-Butanone	ND (1.00)		8260B		1	01/14/20 16:16	C0A0207	CA01453
2-Chlorotoluene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
2-Hexanone	ND (1.00)		8260B		1	01/14/20 16:16	C0A0207	CA01453
4-Chlorotoluene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
4-Isopropyltoluene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
4-Methyl-2-Pentanone	ND (1.00)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Acetone	ND (1.00)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Benzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Bromobenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Bromochloromethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 19.1
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Bromoform	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Bromomethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Carbon Disulfide	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Carbon Tetrachloride	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Chlorobenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Chloroethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Chloroform	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Chloromethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
cis-1,2-Dichloroethene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
cis-1,3-Dichloropropene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Dibromochloromethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Dibromomethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Dichlorodifluoromethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Diethyl Ether	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Di-isopropyl ether	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Ethyl tertiary-butyl ether	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Ethylbenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Hexachlorobutadiene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Isopropylbenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Methyl tert-Butyl Ether	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Methylene Chloride	ND (0.401)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Naphthalene	**9.21** (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
n-Butylbenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
n-Propylbenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
sec-Butylbenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Styrene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
tert-Butylbenzene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Tertiary-amyl methyl ether	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Tetrachloroethene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Tetrahydrofuran	ND (1.00)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Toluene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 19.1
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
trans-1,3-Dichloropropene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Trichloroethene	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Trichlorofluoromethane	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Vinyl Chloride	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Xylene O	ND (0.201)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Xylene P,M	ND (0.401)		8260B		1	01/14/20 16:16	C0A0207	CA01453
Xylenes (Total)	ND (0.401)		8260B		1	01/14/20 16:16		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*142 %*	*SC*	*70-130*
Surrogate: 4-Bromofluorobenzene	*142 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*148 %*	*SC*	*70-130*
Surrogate: Toluene-d8	*146 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 20.8
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 1/14/20 9:15

8015C Diesel Range Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Diesel Range Organics (C10-C28)	**132** (32.4)		8015C		2	01/15/20 11:57	C0A0211	CA01348

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*80 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 19.5
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 1/14/20 9:15

8081B Organochlorine Pesticides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
4,4´-DDD	**0.0042** (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
4,4´-DDE	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
4,4´-DDT	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
Aldrin	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
alpha-BHC	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
alpha-Chlordane [2C]	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
beta-BHC	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
Chlordane (Total)	ND (0.0230)		8081B		1	01/15/20 9:27	C0A0214	CA01346
delta-BHC	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
Dieldrin	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
Endosulfan I	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
Endosulfan II	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
Endosulfan Sulfate	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
Endrin	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
Endrin Ketone	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
gamma-BHC (Lindane)	ND (0.0017)		8081B		1	01/15/20 9:27	C0A0214	CA01346
gamma-Chlordane	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
Heptachlor	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
Heptachlor Epoxide	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
Hexachlorobenzene	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346
Methoxychlor	ND (0.0029)		8081B		1	01/15/20 9:27	C0A0214	CA01346

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*46 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*51 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*65 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*66 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 19.5
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 1/14/20 10:00

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	01/15/20 14:27		CA01342
Aroclor 1221	ND (0.06)		8082A		1	01/15/20 14:27		CA01342
Aroclor 1232	ND (0.06)		8082A		1	01/15/20 14:27		CA01342
Aroclor 1242	ND (0.06)		8082A		1	01/15/20 14:27		CA01342
Aroclor 1248	ND (0.06)		8082A		1	01/15/20 14:27		CA01342
Aroclor 1254	ND (0.06)		8082A		1	01/15/20 14:27		CA01342
Aroclor 1260	ND (0.06)		8082A		1	01/15/20 14:27		CA01342
Aroclor 1262	ND (0.06)		8082A		1	01/15/20 14:27		CA01342
Aroclor 1268	ND (0.06)		8082A		1	01/15/20 14:27		CA01342

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*78 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*86 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*67 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*83 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 10.1
Final Volume: 4
Extraction Method: 3546

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 1/14/20 15:33

8151A Chlorinated Herbicides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2,4,5-T	ND (0.011)		8151A		1	01/17/20 21:33	D0A0018	CA01374
2,4,5-TP (Silvex)	ND (0.011)		8151A		1	01/17/20 21:33	D0A0018	CA01374
2,4-D	ND (0.052)		8151A		1	01/17/20 21:33	D0A0018	CA01374
2,4-DB	ND (0.053)		8151A		1	01/17/20 21:33	D0A0018	CA01374
Dalapon	ND (0.051)		8151A		1	01/17/20 21:33	D0A0018	CA01374
Dicamba [2C]	ND (0.010)		8151A		1	01/17/20 21:33	D0A0018	CA01374
Dichlorprop	ND (0.052)		8151A		1	01/17/20 21:33	D0A0018	CA01374
Dinoseb	ND (0.053)		8151A		1	01/17/20 21:33	D0A0018	CA01374
MCPA [2C]	ND (2.58)		8151A		1	01/17/20 21:33	D0A0018	CA01374
MCPP	# ND (2.61)		8151A		1	01/17/20 21:33	D0A0018	CA01374

	%Recovery	Qualifier	Limits
Surrogate: DCAA	*102 %*		*30-150*
Surrogate: DCAA [2C]	*72 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 14.6
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 1/14/20 9:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2,4-Trichlorobenzene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
1,2-Dichlorobenzene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
1,3-Dichlorobenzene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
1,4-Dichlorobenzene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
2,4,5-Trichlorophenol	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
2,4,6-Trichlorophenol	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
2,4-Dichlorophenol	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
2,4-Dimethylphenol	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
2,4-Dinitrophenol	ND (1.93)		8270D		1	01/14/20 22:43	C0A0190	CA01347
2,4-Dinitrotoluene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
2,6-Dinitrotoluene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
2-Chloronaphthalene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
2-Chlorophenol	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
2-Methylnaphthalene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
2-Methylphenol	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
2-Nitrophenol	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
3,3′-Dichlorobenzidine	ND (0.769)		8270D		1	01/14/20 22:43	C0A0190	CA01347
3+4-Methylphenol	ND (0.769)		8270D		1	01/14/20 22:43	C0A0190	CA01347
4-Bromophenyl-phenylether	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
4-Chloroaniline	ND (0.769)		8270D		1	01/14/20 22:43	C0A0190	CA01347
4-Nitrophenol	ND (1.93)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Acenaphthene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Acenaphthylene	**0.456** (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Acetophenone	ND (0.769)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Aniline	ND (1.93)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Anthracene	**0.634** (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Azobenzene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Benzo(a)anthracene	**1.33** (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Benzo(a)pyrene	**1.31** (0.193)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Benzo(b)fluoranthene	**1.28** (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Benzo(g,h,i)perylene	**0.767** (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Benzo(k)fluoranthene	**0.986** (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 14.6
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 1/14/20 9:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
bis(2-Chloroethoxy)methane	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
bis(2-Chloroethyl)ether	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
bis(2-chloroisopropyl)Ether	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
bis(2-Ethylhexyl)phthalate	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Butylbenzylphthalate	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Chrysene	**1.36** (0.193)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Dibenzo(a,h)Anthracene	**0.341** (0.193)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Dibenzofuran	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Diethylphthalate	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Dimethylphthalate	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Di-n-butylphthalate	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Di-n-octylphthalate	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Fluoranthene	**2.65** (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Fluorene	**0.529** (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Hexachlorobenzene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Hexachlorobutadiene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Hexachloroethane	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Indeno(1,2,3-cd)Pyrene	**0.689** (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Isophorone	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Naphthalene	**0.415** (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Nitrobenzene	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
N-Nitrosodimethylamine	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Pentachlorophenol	ND (1.93)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Phenanthrene	**2.30** (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Phenol	ND (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347
Pyrene	**2.58** (0.384)		8270D		1	01/14/20 22:43	C0A0190	CA01347

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*59 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*80 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*66 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*66 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89
Initial Volume: 14.6
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 1/14/20 9:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorophenol		*59 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*57 %*		*30-130*				
Surrogate: Phenol-d6		*66 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*89 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-3
Date Sampled: 01/08/20 10:15
Percent Solids: 89

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 581** (5)		9050A		1	JLK	01/15/20 19:37	umhos/cm	CA01571
Corrosivity (pH)	**8.80** (N/A)		9045		1	CCP	01/13/20 20:33	S.U.	CA01368
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 20.2 ºC.**								
Flashpoint	**> 200** (N/A)		1010		1	CCP	01/14/20 15:00	°F	CA01458
Reactive Cyanide	ND (2.0)		7.3.3.2		1	EEM	01/16/20 10:32	mg/kg	DA01614
Reactive Sulfide	ND (2.0)		7.3.4.1		1	EEM	01/16/20 10:32	mg/kg	DA01614
Redox Potential	**WL 203** (N/A)		2580		1	CCP	01/13/20 20:33	mv	CA01397

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-10
Date Sampled: 01/08/20 11:07
Percent Solids: 91

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (4.25)		6010C		1	KJK	01/14/20 18:30	2.59	100	CA01378
Arsenic	**2.31** (2.13)		6010C		1	KJK	01/14/20 18:30	2.59	100	CA01378
Barium	**22.1** (2.13)		6010C		1	KJK	01/14/20 18:30	2.59	100	CA01378
Beryllium	**0.23** (0.09)		6010C		1	KJK	01/14/20 18:30	2.59	100	CA01378
Cadmium	ND (0.43)		6010C		1	KJK	01/14/20 18:30	2.59	100	CA01378
Chromium	**5.29** (0.85)		6010C		1	KJK	01/14/20 18:30	2.59	100	CA01378
Lead	ND (4.25)		6010C		1	KJK	01/14/20 18:30	2.59	100	CA01378
Mercury	ND (0.018)		7471B		1	MKS	01/15/20 9:00	1.24	40	CA01379
Nickel	**5.97** (2.13)		6010C		1	KJK	01/14/20 18:30	2.59	100	CA01378
Selenium	ND (4.25)		6010C		1	KJK	01/14/20 18:30	2.59	100	CA01378
Silver	ND (0.43)		6010C		1	KJK	01/14/20 18:30	2.59	100	CA01378
Thallium	ND (0.43)		6020A		1	BJV	01/15/20 12:31	2.59	100	CA01378
Vanadium	**18.4** (0.85)		6010C		1	KJK	01/14/20 18:30	2.59	100	CA01378
Zinc	**20.1** (2.13)		6010C		1	KJK	01/14/20 18:30	2.59	100	CA01378

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-10
Date Sampled: 01/08/20 11:07
Percent Solids: 91
Initial Volume: 11
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,1,1-Trichloroethane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,1,2,2-Tetrachloroethane	ND (0.0010)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,1,2-Trichloroethane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,1-Dichloroethane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,1-Dichloroethene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,1-Dichloropropene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,2,3-Trichlorobenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,2,3-Trichloropropane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,2,4-Trichlorobenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,2,4-Trimethylbenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,2-Dibromo-3-Chloropropane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,2-Dibromoethane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,2-Dichlorobenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,2-Dichloroethane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,2-Dichloropropane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,3,5-Trimethylbenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,3-Dichlorobenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,3-Dichloropropane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,4-Dichlorobenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
1,4-Dioxane	ND (0.0500)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
2,2-Dichloropropane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
2-Butanone	ND (0.0050)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
2-Chlorotoluene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
2-Hexanone	ND (0.0050)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
4-Chlorotoluene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
4-Isopropyltoluene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
4-Methyl-2-Pentanone	ND (0.0050)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Acetone	ND (0.0050)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Benzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Bromobenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Bromochloromethane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-10
Date Sampled: 01/08/20 11:07
Percent Solids: 91
Initial Volume: 11
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Bromoform	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Bromomethane	ND (0.0050)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Carbon Disulfide	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Carbon Tetrachloride	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Chlorobenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Chloroethane	ND (0.0050)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Chloroform	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Chloromethane	ND (0.0050)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
cis-1,2-Dichloroethene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
cis-1,3-Dichloropropene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Dibromochloromethane	ND (0.0010)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Dibromomethane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Dichlorodifluoromethane	ND (0.0050)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Diethyl Ether	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Di-isopropyl ether	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Ethyl tertiary-butyl ether	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Ethylbenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Hexachlorobutadiene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Isopropylbenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Methyl tert-Butyl Ether	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Methylene Chloride	ND (0.0050)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Naphthalene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
n-Butylbenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
n-Propylbenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
sec-Butylbenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Styrene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
tert-Butylbenzene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Tertiary-amyl methyl ether	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Tetrachloroethene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Tetrahydrofuran	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Toluene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-10
Date Sampled: 01/08/20 11:07
Percent Solids: 91
Initial Volume: 11
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
trans-1,3-Dichloropropene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Trichloroethene	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Trichlorofluoromethane	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Vinyl Chloride	ND (0.0050)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Xylene O	ND (0.0025)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Xylene P,M	ND (0.0050)		8260B Low		1	01/14/20 14:27	C0A0209	CA01454
Xylenes (Total)	ND (0.00500)		8260B Low		1	01/14/20 14:27		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*109 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*101 %*		*70-130*
Surrogate: Dibromofluoromethane	*101 %*		*70-130*
Surrogate: Toluene-d8	*97 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-10
Date Sampled: 01/08/20 11:07
Percent Solids: 91
Initial Volume: 20.5
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CAD
Prepared: 1/14/20 9:15

8015C Diesel Range Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Diesel Range Organics (C10-C28)	ND (16.1)		8015C		1	01/15/20 10:44	C0A0211	CA01348

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*90 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-10
Date Sampled: 01/08/20 11:07
Percent Solids: 91
Initial Volume: 20.9
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 1/14/20 9:15

8081B Organochlorine Pesticides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
4,4´-DDD	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
4,4´-DDE	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
4,4´-DDT	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
Aldrin	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
alpha-BHC	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
alpha-Chlordane	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
beta-BHC	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
Chlordane (Total)	ND (0.0211)		8081B		1	01/15/20 8:57	C0A0214	CA01346
delta-BHC	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
Dieldrin	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
Endosulfan I	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
Endosulfan II	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
Endosulfan Sulfate	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
Endrin	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
Endrin Ketone	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
gamma-BHC (Lindane)	ND (0.0016)		8081B		1	01/15/20 8:57	C0A0214	CA01346
gamma-Chlordane	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
Heptachlor	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
Heptachlor Epoxide	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
Hexachlorobenzene	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346
Methoxychlor	ND (0.0026)		8081B		1	01/15/20 8:57	C0A0214	CA01346

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*83 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*81 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*74 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*71 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-10
Date Sampled: 01/08/20 11:07
Percent Solids: 91
Initial Volume: 19.7
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 1/14/20 10:00

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.06)		8082A		1	01/15/20 14:44		CA01342
Aroclor 1221	ND (0.06)		8082A		1	01/15/20 14:44		CA01342
Aroclor 1232	ND (0.06)		8082A		1	01/15/20 14:44		CA01342
Aroclor 1242	ND (0.06)		8082A		1	01/15/20 14:44		CA01342
Aroclor 1248	ND (0.06)		8082A		1	01/15/20 14:44		CA01342
Aroclor 1254	ND (0.06)		8082A		1	01/15/20 14:44		CA01342
Aroclor 1260	ND (0.06)		8082A		1	01/15/20 14:44		CA01342
Aroclor 1262	ND (0.06)		8082A		1	01/15/20 14:44		CA01342
Aroclor 1268	ND (0.06)		8082A		1	01/15/20 14:44		CA01342

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*89 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*90 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*81 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*90 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-10
Date Sampled: 01/08/20 11:07
Percent Solids: 91
Initial Volume: 10.2
Final Volume: 4
Extraction Method: 3546

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 1/14/20 15:33

8151A Chlorinated Herbicides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2,4,5-T	ND (0.010)		8151A		1	01/17/20 22:02	D0A0018	CA01374
2,4,5-TP (Silvex)	ND (0.010)		8151A		1	01/17/20 22:02	D0A0018	CA01374
2,4-D	ND (0.051)		8151A		1	01/17/20 22:02	D0A0018	CA01374
2,4-DB	ND (0.051)		8151A		1	01/17/20 22:02	D0A0018	CA01374
Dalapon	ND (0.049)		8151A		1	01/17/20 22:02	D0A0018	CA01374
Dicamba	ND (0.010)		8151A		1	01/17/20 22:02	D0A0018	CA01374
Dichlorprop	ND (0.051)		8151A		1	01/17/20 22:02	D0A0018	CA01374
Dinoseb	ND (0.051)		8151A		1	01/17/20 22:02	D0A0018	CA01374
MCPA	ND (2.51)		8151A		1	01/17/20 22:02	D0A0018	CA01374
MCPP	# ND (2.54)		8151A		1	01/17/20 22:02	D0A0018	CA01374

	%Recovery	Qualifier	Limits
Surrogate: DCAA	*108 %*		*30-150*
Surrogate: DCAA [2C]	*143 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-10
Date Sampled: 01/08/20 11:07
Percent Solids: 91
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 1/14/20 9:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2,4-Trichlorobenzene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
1,2-Dichlorobenzene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
1,3-Dichlorobenzene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
1,4-Dichlorobenzene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
2,4,5-Trichlorophenol	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
2,4,6-Trichlorophenol	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
2,4-Dichlorophenol	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
2,4-Dimethylphenol	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
2,4-Dinitrophenol	ND (1.73)		8270D		1	01/14/20 23:11	C0A0190	CA01347
2,4-Dinitrotoluene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
2,6-Dinitrotoluene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
2-Chloronaphthalene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
2-Chlorophenol	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
2-Methylnaphthalene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
2-Methylphenol	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
2-Nitrophenol	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
3,3′-Dichlorobenzidine	ND (0.693)		8270D		1	01/14/20 23:11	C0A0190	CA01347
3+4-Methylphenol	ND (0.693)		8270D		1	01/14/20 23:11	C0A0190	CA01347
4-Bromophenyl-phenylether	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
4-Chloroaniline	ND (0.693)		8270D		1	01/14/20 23:11	C0A0190	CA01347
4-Nitrophenol	ND (1.73)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Acenaphthene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Acenaphthylene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Acetophenone	ND (0.693)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Aniline	ND (1.73)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Anthracene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Azobenzene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Benzo(a)anthracene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Benzo(a)pyrene	ND (0.173)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Benzo(b)fluoranthene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Benzo(g,h,i)perylene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Benzo(k)fluoranthene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-10
Date Sampled: 01/08/20 11:07
Percent Solids: 91
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 1/14/20 9:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
bis(2-Chloroethoxy)methane	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
bis(2-Chloroethyl)ether	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
bis(2-chloroisopropyl)Ether	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
bis(2-Ethylhexyl)phthalate	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Butylbenzylphthalate	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Chrysene	ND (0.173)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Dibenzo(a,h)Anthracene	ND (0.173)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Dibenzofuran	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Diethylphthalate	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Dimethylphthalate	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Di-n-butylphthalate	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Di-n-octylphthalate	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Fluoranthene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Fluorene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Hexachlorobenzene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Hexachlorobutadiene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Hexachloroethane	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Indeno(1,2,3-cd)Pyrene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Isophorone	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Naphthalene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Nitrobenzene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
N-Nitrosodimethylamine	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Pentachlorophenol	ND (1.73)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Phenanthrene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Phenol	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347
Pyrene	ND (0.346)		8270D		1	01/14/20 23:11	C0A0190	CA01347

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*70 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*82 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*75 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*71 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-10
Date Sampled: 01/08/20 11:07
Percent Solids: 91
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 1/14/20 9:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorophenol		*71 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*66 %*		*30-130*				
Surrogate: Phenol-d6		*70 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*86 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street
Client Sample ID: GZ-1 S-10
Date Sampled: 01/08/20 11:07
Percent Solids: 91

ESS Laboratory Work Order: 20A0294
ESS Laboratory Sample ID: 20A0294-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 182** (5)		9050A		1	JLK	01/15/20 19:37	umhos/cm	CA01571
Corrosivity (pH)	**7.93** (N/A)		9045		1	CCP	01/13/20 20:33	S.U.	CA01368
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 20.0 ºC.**								
Flashpoint	**> 200** (N/A)		1010		1	CCP	01/14/20 15:00	°F	CA01458
Reactive Cyanide	ND (2.0)		7.3.3.2		1	EEM	01/16/20 10:32	mg/kg	DA01614
Reactive Sulfide	ND (2.0)		7.3.4.1		1	EEM	01/16/20 10:32	mg/kg	DA01614
Redox Potential	**WL 209** (N/A)		2580		1	CCP	01/13/20 20:33	mv	CA01397

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CA01378 - 3050B										
Blank										
Antimony	ND	5.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Barium	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	5.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	5.00	mg/kg wet							
Vanadium	ND	1.00	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
Blank										
Thallium	ND	0.50	mg/kg wet							
LCS										
Antimony	44.6	14.3	mg/kg wet	51.30		87	40-160			
Arsenic	176	7.14	mg/kg wet	202.0		87	80-120			
Barium	291	7.14	mg/kg wet	343.0		85	80-120			
Beryllium	45.9	0.31	mg/kg wet	52.10		88	80-120			
Cadmium	119	1.43	mg/kg wet	149.0		80	80-120			
Chromium	161	2.86	mg/kg wet	182.0		88	80-120			
Lead	296	14.3	mg/kg wet	333.0		89	80-120			
Nickel	148	7.14	mg/kg wet	167.0		88	80-120			
Selenium	147	14.3	mg/kg wet	169.0		87	80-120			
Silver	42.3	1.43	mg/kg wet	48.90		86	80-120			
Thallium	64.7	14.3	mg/kg wet	82.30		79	62-139			
Vanadium	208	2.86	mg/kg wet	227.0		92	80-120			
Zinc	387	7.14	mg/kg wet	459.0		84	80-120			
LCS										
Cadmium	46.8	1.54	mg/kg wet	61.50		76	69-114			
LCS										
Thallium	75.7	7.14	mg/kg wet	82.30		92	80-120			
LCS Dup										
Antimony	39.7	13.2	mg/kg wet	51.30		77	40-160	11	20	
Arsenic	176	6.58	mg/kg wet	202.0		87	80-120	0.1	20	
Barium	321	6.58	mg/kg wet	343.0		94	80-120	10	20	
Beryllium	44.9	0.29	mg/kg wet	52.10		86	80-120	2	20	
Cadmium	119	1.32	mg/kg wet	149.0		80	80-120	0.8	20	
Chromium	160	2.63	mg/kg wet	182.0		88	80-120	0.2	20	
Lead	298	13.2	mg/kg wet	333.0		90	80-120	0.9	20	
Nickel	148	6.58	mg/kg wet	167.0		88	80-120	0.004	20	
Selenium	147	13.2	mg/kg wet	169.0		87	80-120	0.4	20	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CA01378 - 3050B										
Silver	42.6	1.32	mg/kg wet	48.90		87	80-120	0.8	20	
Thallium	66.2	13.2	mg/kg wet	82.30		80	62-139	2	20	
Vanadium	208	2.63	mg/kg wet	227.0		92	80-120	0.3	20	
Zinc	389	6.58	mg/kg wet	459.0		85	80-120	0.5	20	
LCS Dup										
Cadmium	48.6	1.59	mg/kg wet	61.50		79	69-114	4	20	
LCS Dup										
Thallium	83.8	6.58	mg/kg wet	82.30		102	80-120	10	30	
Batch CA01379 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	8.08	0.558	mg/kg wet	7.760		104	80-120			
LCS Dup										
Mercury	8.09	0.639	mg/kg wet	7.760		104	80-120	0.1	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch CA01454 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0020	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0100	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CA01454 - 5035										
2-Hexanone	ND	0.0100	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0100	mg/kg wet							
Acetone	ND	0.0100	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0020	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0100	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CA01454 - 5035										
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0520*		mg/kg wet	*0.05000*		*104*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0493*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0480*		mg/kg wet	*0.05000*		*96*	*70-130*			
Surrogate: Toluene-d8	*0.0481*		mg/kg wet	*0.05000*		*96*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
1,1,1-Trichloroethane	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
1,1,2,2-Tetrachloroethane	0.0439	0.0020	mg/kg wet	0.05000		88	70-130			
1,1,2-Trichloroethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
1,1-Dichloroethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,1-Dichloroethene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
1,1-Dichloropropene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
1,2,3-Trichlorobenzene	0.0444	0.0050	mg/kg wet	0.05000		89	70-130			
1,2,3-Trichloropropane	0.0402	0.0050	mg/kg wet	0.05000		80	70-130			
1,2,4-Trichlorobenzene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			
1,2,4-Trimethylbenzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
1,2-Dibromo-3-Chloropropane	0.0330	0.0050	mg/kg wet	0.05000		66	70-130			B-
1,2-Dibromoethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichlorobenzene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130			
1,2-Dichloroethane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
1,2-Dichloropropane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
1,3,5-Trimethylbenzene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
1,3-Dichlorobenzene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130			
1,3-Dichloropropane	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
1,4-Dichlorobenzene	0.0450	0.0050	mg/kg wet	0.05000		90	70-130			
1,4-Dioxane	0.902	0.100	mg/kg wet	1.000		90	70-130			
2,2-Dichloropropane	0.0382	0.0050	mg/kg wet	0.05000		76	70-130			
2-Butanone	0.260	0.0100	mg/kg wet	0.2500		104	70-130			
2-Chlorotoluene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
2-Hexanone	0.245	0.0100	mg/kg wet	0.2500		98	70-130			
4-Chlorotoluene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
4-Isopropyltoluene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
4-Methyl-2-Pentanone	0.247	0.0100	mg/kg wet	0.2500		99	70-130			
Acetone	0.226	0.0100	mg/kg wet	0.2500		90	70-130			
Benzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
Bromobenzene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
Bromochloromethane	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
Bromodichloromethane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
Bromoform	0.0389	0.0050	mg/kg wet	0.05000		78	70-130			
Bromomethane	0.0568	0.0100	mg/kg wet	0.05000		114	70-130			
Carbon Disulfide	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
Carbon Tetrachloride	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
Chlorobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CA01454 - 5035										
Chloroethane	0.0458	0.0100	mg/kg wet	0.05000		92	70-130			
Chloroform	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Chloromethane	0.0444	0.0100	mg/kg wet	0.05000		89	70-130			
cis-1,2-Dichloroethene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
cis-1,3-Dichloropropene	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
Dibromochloromethane	0.0426	0.0020	mg/kg wet	0.05000		85	70-130			
Dibromomethane	0.0469	0.0050	mg/kg wet	0.05000		94	70-130			
Dichlorodifluoromethane	0.0409	0.0100	mg/kg wet	0.05000		82	70-130			
Diethyl Ether	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Di-isopropyl ether	0.0529	0.0050	mg/kg wet	0.05000		106	70-130			
Ethyl tertiary-butyl ether	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
Ethylbenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
Hexachlorobutadiene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
Isopropylbenzene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
Methyl tert-Butyl Ether	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Methylene Chloride	0.0462	0.0100	mg/kg wet	0.05000		92	70-130			
Naphthalene	0.0424	0.0050	mg/kg wet	0.05000		85	70-130			
n-Butylbenzene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
n-Propylbenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
sec-Butylbenzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
Styrene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
tert-Butylbenzene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Tertiary-amyl methyl ether	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
Tetrachloroethene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
Tetrahydrofuran	0.0425	0.0050	mg/kg wet	0.05000		85	70-130			
Toluene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
trans-1,2-Dichloroethene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
trans-1,3-Dichloropropene	0.0412	0.0050	mg/kg wet	0.05000		82	70-130			
Trichloroethene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Trichlorofluoromethane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
Vinyl Chloride	0.0455	0.0100	mg/kg wet	0.05000		91	70-130			
Xylene O	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
Xylene P,M	0.0993	0.0100	mg/kg wet	0.1000		99	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0499*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0508*		mg/kg wet	*0.05000*		*102*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0490*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Toluene-d8	*0.0501*		mg/kg wet	*0.05000*		*100*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	6	20	
1,1,1-Trichloroethane	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	5	20	
1,1,2,2-Tetrachloroethane	0.0445	0.0020	mg/kg wet	0.05000		89	70-130	1	20	
1,1,2-Trichloroethane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	3	20	
1,1-Dichloroethane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	5	20	
1,1-Dichloroethene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	3	20	
1,1-Dichloropropene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	4	20	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CA01454 - 5035										
1,2,3-Trichlorobenzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	6	20	
1,2,3-Trichloropropane	0.0406	0.0050	mg/kg wet	0.05000		81	70-130	1	20	
1,2,4-Trichlorobenzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	7	20	
1,2,4-Trimethylbenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	8	20	
1,2-Dibromo-3-Chloropropane	0.0358	0.0050	mg/kg wet	0.05000		72	70-130	8	20	
1,2-Dibromoethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	2	20	
1,2-Dichlorobenzene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	7	20	
1,2-Dichloroethane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	4	20	
1,2-Dichloropropane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	6	20	
1,3,5-Trimethylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	9	20	
1,3-Dichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	6	20	
1,3-Dichloropropane	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	3	20	
1,4-Dichlorobenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	11	20	
1,4-Dioxane	0.876	0.100	mg/kg wet	1.000		88	70-130	3	20	
2,2-Dichloropropane	0.0412	0.0050	mg/kg wet	0.05000		82	70-130	8	20	
2-Butanone	0.259	0.0100	mg/kg wet	0.2500		104	70-130	0.4	20	
2-Chlorotoluene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	8	20	
2-Hexanone	0.231	0.0100	mg/kg wet	0.2500		92	70-130	6	20	
4-Chlorotoluene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	9	20	
4-Isopropyltoluene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	8	20	
4-Methyl-2-Pentanone	0.237	0.0100	mg/kg wet	0.2500		95	70-130	4	20	
Acetone	0.213	0.0100	mg/kg wet	0.2500		85	70-130	6	20	
Benzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	5	20	
Bromobenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	8	20	
Bromochloromethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	4	20	
Bromodichloromethane	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	5	20	
Bromoform	0.0397	0.0050	mg/kg wet	0.05000		79	70-130	2	20	
Bromomethane	0.0555	0.0100	mg/kg wet	0.05000		111	70-130	2	20	
Carbon Disulfide	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	4	20	
Carbon Tetrachloride	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	5	20	
Chlorobenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	5	20	
Chloroethane	0.0478	0.0100	mg/kg wet	0.05000		96	70-130	4	20	
Chloroform	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	5	20	
Chloromethane	0.0458	0.0100	mg/kg wet	0.05000		92	70-130	3	20	
cis-1,2-Dichloroethene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	5	20	
cis-1,3-Dichloropropene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	6	20	
Dibromochloromethane	0.0450	0.0020	mg/kg wet	0.05000		90	70-130	5	20	
Dibromomethane	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	5	20	
Dichlorodifluoromethane	0.0423	0.0100	mg/kg wet	0.05000		85	70-130	4	20	
Diethyl Ether	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	3	20	
Di-isopropyl ether	0.0558	0.0050	mg/kg wet	0.05000		112	70-130	5	20	
Ethyl tertiary-butyl ether	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	6	20	
Ethylbenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	4	20	
Hexachlorobutadiene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	7	20	
Isopropylbenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	8	20	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CA01454 - 5035										
Methyl tert-Butyl Ether	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	3	20	
Methylene Chloride	0.0486	0.0100	mg/kg wet	0.05000		97	70-130	5	20	
Naphthalene	0.0437	0.0050	mg/kg wet	0.05000		87	70-130	3	20	
n-Butylbenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	9	20	
n-Propylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	8	20	
sec-Butylbenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	7	20	
Styrene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	6	20	
tert-Butylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	7	20	
Tertiary-amyl methyl ether	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	5	20	
Tetrachloroethene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	4	20	
Tetrahydrofuran	0.0405	0.0050	mg/kg wet	0.05000		81	70-130	5	20	
Toluene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	5	20	
trans-1,2-Dichloroethene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	3	20	
trans-1,3-Dichloropropene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130	6	20	
Trichloroethene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	3	20	
Trichlorofluoromethane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	3	20	
Vinyl Chloride	0.0469	0.0100	mg/kg wet	0.05000		94	70-130	3	20	
Xylene O	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	6	20	
Xylene P,M	0.106	0.0100	mg/kg wet	0.1000		106	70-130	6	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0484*		mg/kg wet	*0.05000*		*97*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0496*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0486*		mg/kg wet	*0.05000*		*97*	*70-130*			
Surrogate: Toluene-d8	*0.0495*		mg/kg wet	*0.05000*		*99*	*70-130*			
5035/8260B Volatile Organic Compounds / Methanol										
Batch CA01453 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,1-Trichloroethane	ND	0.200	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,2-Trichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethene	ND	0.200	mg/kg wet							
1,1-Dichloropropene	ND	0.200	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,3-Trichloropropane	ND	0.200	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet							
1,2-Dibromoethane	ND	0.200	mg/kg wet							
1,2-Dichlorobenzene	ND	0.200	mg/kg wet							
1,2-Dichloroethane	ND	0.200	mg/kg wet							
1,2-Dichloropropane	ND	0.200	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet							
1,3-Dichlorobenzene	ND	0.200	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CA01453 - 5035										
1,3-Dichloropropane	ND	0.200	mg/kg wet							
1,4-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dioxane - Screen	ND	40.0	mg/kg wet							
2,2-Dichloropropane	ND	0.200	mg/kg wet							
2-Butanone	ND	1.00	mg/kg wet							
2-Chlorotoluene	ND	0.200	mg/kg wet							
2-Hexanone	ND	1.00	mg/kg wet							
4-Chlorotoluene	ND	0.200	mg/kg wet							
4-Isopropyltoluene	ND	0.200	mg/kg wet							
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet							
Acetone	ND	1.00	mg/kg wet							
Benzene	ND	0.200	mg/kg wet							
Bromobenzene	ND	0.200	mg/kg wet							
Bromochloromethane	ND	0.200	mg/kg wet							
Bromodichloromethane	ND	0.200	mg/kg wet							
Bromoform	ND	0.200	mg/kg wet							
Bromomethane	ND	0.200	mg/kg wet							
Carbon Disulfide	ND	0.200	mg/kg wet							
Carbon Tetrachloride	ND	0.200	mg/kg wet							
Chlorobenzene	ND	0.200	mg/kg wet							
Chloroethane	ND	0.200	mg/kg wet							
Chloroform	ND	0.200	mg/kg wet							
Chloromethane	ND	0.200	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Dibromochloromethane	ND	0.200	mg/kg wet							
Dibromomethane	ND	0.200	mg/kg wet							
Dichlorodifluoromethane	ND	0.200	mg/kg wet							
Diethyl Ether	ND	0.200	mg/kg wet							
Di-isopropyl ether	ND	0.200	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Hexachlorobutadiene	ND	0.200	mg/kg wet							
Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	ND	0.400	mg/kg wet							
Naphthalene	ND	0.200	mg/kg wet							
n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tetrachloroethene	ND	0.200	mg/kg wet							
Tetrahydrofuran	ND	1.00	mg/kg wet							

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Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CA01453 - 5035										
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Trichlorofluoromethane	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.71*		mg/kg wet	*5.000*		*94*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.16*		mg/kg wet	*5.000*		*83*	*70-130*			
Surrogate: Dibromofluoromethane	*4.75*		mg/kg wet	*5.000*		*95*	*70-130*			
Surrogate: Toluene-d8	*4.34*		mg/kg wet	*5.000*		*87*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	1.74	0.200	mg/kg wet	2.000		87	70-130			
1,1,1-Trichloroethane	2.12	0.200	mg/kg wet	2.000		106	70-130			
1,1,2,2-Tetrachloroethane	1.79	0.200	mg/kg wet	2.000		90	70-130			
1,1,2-Trichloroethane	1.92	0.200	mg/kg wet	2.000		96	70-130			
1,1-Dichloroethane	1.99	0.200	mg/kg wet	2.000		99	70-130			
1,1-Dichloroethene	2.16	0.200	mg/kg wet	2.000		108	70-130			
1,1-Dichloropropene	2.15	0.200	mg/kg wet	2.000		107	70-130			
1,2,3-Trichlorobenzene	1.88	0.200	mg/kg wet	2.000		94	70-130			
1,2,3-Trichloropropane	1.64	0.200	mg/kg wet	2.000		82	70-130			
1,2,4-Trichlorobenzene	1.90	0.200	mg/kg wet	2.000		95	70-130			
1,2,4-Trimethylbenzene	1.98	0.200	mg/kg wet	2.000		99	70-130			
1,2-Dibromo-3-Chloropropane	1.68	1.00	mg/kg wet	2.000		84	70-130			
1,2-Dibromoethane	1.99	0.200	mg/kg wet	2.000		99	70-130			
1,2-Dichlorobenzene	1.88	0.200	mg/kg wet	2.000		94	70-130			
1,2-Dichloroethane	2.11	0.200	mg/kg wet	2.000		106	70-130			
1,2-Dichloropropane	1.87	0.200	mg/kg wet	2.000		93	70-130			
1,3,5-Trimethylbenzene	1.93	0.200	mg/kg wet	2.000		96	70-130			
1,3-Dichlorobenzene	1.85	0.200	mg/kg wet	2.000		93	70-130			
1,3-Dichloropropane	1.90	0.200	mg/kg wet	2.000		95	70-130			
1,4-Dichlorobenzene	1.94	0.200	mg/kg wet	2.000		97	70-130			
1,4-Dioxane - Screen	53.2	40.0	mg/kg wet	40.00		133	44-241			
2,2-Dichloropropane	2.05	0.200	mg/kg wet	2.000		102	70-130			
2-Butanone	10.5	1.00	mg/kg wet	10.00		105	70-130			
2-Chlorotoluene	1.96	0.200	mg/kg wet	2.000		98	70-130			
2-Hexanone	8.63	1.00	mg/kg wet	10.00		86	70-130			
4-Chlorotoluene	1.97	0.200	mg/kg wet	2.000		99	70-130			
4-Isopropyltoluene	1.95	0.200	mg/kg wet	2.000		97	70-130			
4-Methyl-2-Pentanone	9.12	1.00	mg/kg wet	10.00		91	70-130			
Acetone	9.13	1.00	mg/kg wet	10.00		91	70-130			
Benzene	2.08	0.200	mg/kg wet	2.000		104	70-130			
Bromobenzene	1.88	0.200	mg/kg wet	2.000		94	70-130			
Bromochloromethane	2.19	0.200	mg/kg wet	2.000		110	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CA01453 - 5035										
Bromodichloromethane	1.95	0.200	mg/kg wet	2.000		97	70-130			
Bromoform	1.51	0.200	mg/kg wet	2.000		76	70-130			
Bromomethane	1.59	0.200	mg/kg wet	2.000		80	70-130			
Carbon Disulfide	1.97	0.200	mg/kg wet	2.000		98	70-130			
Carbon Tetrachloride	2.05	0.200	mg/kg wet	2.000		103	70-130			
Chlorobenzene	1.89	0.200	mg/kg wet	2.000		95	70-130			
Chloroethane	1.75	0.200	mg/kg wet	2.000		88	70-130			
Chloroform	2.12	0.200	mg/kg wet	2.000		106	70-130			
Chloromethane	1.44	0.200	mg/kg wet	2.000		72	70-130			
cis-1,2-Dichloroethene	2.23	0.200	mg/kg wet	2.000		111	70-130			
cis-1,3-Dichloropropene	1.87	0.200	mg/kg wet	2.000		93	70-130			
Dibromochloromethane	1.72	0.200	mg/kg wet	2.000		86	70-130			
Dibromomethane	2.24	0.200	mg/kg wet	2.000		112	70-130			
Dichlorodifluoromethane	1.83	0.200	mg/kg wet	2.000		92	70-130			
Diethyl Ether	1.74	0.200	mg/kg wet	2.000		87	70-130			
Di-isopropyl ether	2.27	0.200	mg/kg wet	2.000		114	70-130			
Ethyl tertiary-butyl ether	2.10	0.200	mg/kg wet	2.000		105	70-130			
Ethylbenzene	1.88	0.200	mg/kg wet	2.000		94	70-130			
Hexachlorobutadiene	1.95	0.200	mg/kg wet	2.000		98	70-130			
Isopropylbenzene	1.87	0.200	mg/kg wet	2.000		93	70-130			
Methyl tert-Butyl Ether	2.29	0.200	mg/kg wet	2.000		115	70-130			
Methylene Chloride	2.05	0.400	mg/kg wet	2.000		102	70-130			
Naphthalene	1.93	0.200	mg/kg wet	2.000		96	70-130			
n-Butylbenzene	1.91	0.200	mg/kg wet	2.000		96	70-130			
n-Propylbenzene	1.89	0.200	mg/kg wet	2.000		95	70-130			
sec-Butylbenzene	1.98	0.200	mg/kg wet	2.000		99	70-130			
Styrene	1.78	0.200	mg/kg wet	2.000		89	70-130			
tert-Butylbenzene	1.99	0.200	mg/kg wet	2.000		100	70-130			
Tertiary-amyl methyl ether	2.19	0.200	mg/kg wet	2.000		110	70-130			
Tetrachloroethene	1.69	0.200	mg/kg wet	2.000		85	70-130			
Tetrahydrofuran	2.06	1.00	mg/kg wet	2.000		103	70-130			
Toluene	2.01	0.200	mg/kg wet	2.000		101	70-130			
trans-1,2-Dichloroethene	2.20	0.200	mg/kg wet	2.000		110	70-130			
trans-1,3-Dichloropropene	1.85	0.200	mg/kg wet	2.000		93	70-130			
Trichloroethene	2.07	0.200	mg/kg wet	2.000		103	70-130			
Trichlorofluoromethane	2.48	0.200	mg/kg wet	2.000		124	70-130			
Vinyl Chloride	1.71	0.200	mg/kg wet	2.000		85	70-130			
Xylene O	1.84	0.200	mg/kg wet	2.000		92	70-130			
Xylene P,M	3.74	0.400	mg/kg wet	4.000		94	70-130			
Surrogate: 1,2-Dichloroethane-d4	*5.36*		mg/kg wet	*5.000*		*107*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.01*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*5.66*		mg/kg wet	*5.000*		*113*	*70-130*			
Surrogate: Toluene-d8	*4.88*		mg/kg wet	*5.000*		*98*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	1.75	0.200	mg/kg wet	2.000		88	70-130	1	20	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CA01453 - 5035										
1,1,1-Trichloroethane	2.19	0.200	mg/kg wet	2.000		109	70-130	3	20	
1,1,2,2-Tetrachloroethane	1.82	0.200	mg/kg wet	2.000		91	70-130	2	20	
1,1,2-Trichloroethane	2.03	0.200	mg/kg wet	2.000		101	70-130	6	20	
1,1-Dichloroethane	2.14	0.200	mg/kg wet	2.000		107	70-130	7	20	
1,1-Dichloroethene	2.26	0.200	mg/kg wet	2.000		113	70-130	4	20	
1,1-Dichloropropene	2.08	0.200	mg/kg wet	2.000		104	70-130	3	20	
1,2,3-Trichlorobenzene	1.79	0.200	mg/kg wet	2.000		90	70-130	5	20	
1,2,3-Trichloropropane	1.72	0.200	mg/kg wet	2.000		86	70-130	5	20	
1,2,4-Trichlorobenzene	1.78	0.200	mg/kg wet	2.000		89	70-130	7	20	
1,2,4-Trimethylbenzene	2.01	0.200	mg/kg wet	2.000		101	70-130	2	20	
1,2-Dibromo-3-Chloropropane	1.46	1.00	mg/kg wet	2.000		73	70-130	14	20	
1,2-Dibromoethane	1.92	0.200	mg/kg wet	2.000		96	70-130	3	20	
1,2-Dichlorobenzene	1.81	0.200	mg/kg wet	2.000		90	70-130	4	20	
1,2-Dichloroethane	2.23	0.200	mg/kg wet	2.000		112	70-130	5	20	
1,2-Dichloropropane	2.05	0.200	mg/kg wet	2.000		102	70-130	9	20	
1,3,5-Trimethylbenzene	1.98	0.200	mg/kg wet	2.000		99	70-130	3	20	
1,3-Dichlorobenzene	1.89	0.200	mg/kg wet	2.000		94	70-130	2	20	
1,3-Dichloropropane	1.84	0.200	mg/kg wet	2.000		92	70-130	3	20	
1,4-Dichlorobenzene	1.92	0.200	mg/kg wet	2.000		96	70-130	1	20	
1,4-Dioxane - Screen	ND	40.0	mg/kg wet	40.00		0	44-241	200	200	B-
2,2-Dichloropropane	2.10	0.200	mg/kg wet	2.000		105	70-130	2	20	
2-Butanone	10.5	1.00	mg/kg wet	10.00		105	70-130	0.08	20	
2-Chlorotoluene	1.99	0.200	mg/kg wet	2.000		99	70-130	2	20	
2-Hexanone	8.44	1.00	mg/kg wet	10.00		84	70-130	2	20	
4-Chlorotoluene	1.90	0.200	mg/kg wet	2.000		95	70-130	4	20	
4-Isopropyltoluene	1.96	0.200	mg/kg wet	2.000		98	70-130	0.6	20	
4-Methyl-2-Pentanone	9.62	1.00	mg/kg wet	10.00		96	70-130	5	20	
Acetone	9.26	1.00	mg/kg wet	10.00		93	70-130	1	20	
Benzene	2.16	0.200	mg/kg wet	2.000		108	70-130	4	20	
Bromobenzene	1.95	0.200	mg/kg wet	2.000		98	70-130	4	20	
Bromochloromethane	2.18	0.200	mg/kg wet	2.000		109	70-130	0.5	20	
Bromodichloromethane	2.05	0.200	mg/kg wet	2.000		102	70-130	5	20	
Bromoform	1.48	0.200	mg/kg wet	2.000		74	70-130	2	20	
Bromomethane	1.81	0.200	mg/kg wet	2.000		90	70-130	13	20	
Carbon Disulfide	2.06	0.200	mg/kg wet	2.000		103	70-130	4	20	
Carbon Tetrachloride	2.12	0.200	mg/kg wet	2.000		106	70-130	3	20	
Chlorobenzene	1.90	0.200	mg/kg wet	2.000		95	70-130	0.2	20	
Chloroethane	1.90	0.200	mg/kg wet	2.000		95	70-130	8	20	
Chloroform	2.32	0.200	mg/kg wet	2.000		116	70-130	9	20	
Chloromethane	1.57	0.200	mg/kg wet	2.000		79	70-130	9	20	
cis-1,2-Dichloroethene	2.26	0.200	mg/kg wet	2.000		113	70-130	1	20	
cis-1,3-Dichloropropene	1.88	0.200	mg/kg wet	2.000		94	70-130	0.7	20	
Dibromochloromethane	1.65	0.200	mg/kg wet	2.000		83	70-130	4	20	
Dibromomethane	2.35	0.200	mg/kg wet	2.000		117	70-130	5	20	
Dichlorodifluoromethane	1.95	0.200	mg/kg wet	2.000		98	70-130	6	20	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CA01453 - 5035										
Diethyl Ether	1.79	0.200	mg/kg wet	2.000		90	70-130	3	20	
Di-isopropyl ether	2.33	0.200	mg/kg wet	2.000		116	70-130	3	20	
Ethyl tertiary-butyl ether	2.09	0.200	mg/kg wet	2.000		104	70-130	0.7	20	
Ethylbenzene	1.90	0.200	mg/kg wet	2.000		95	70-130	1	20	
Hexachlorobutadiene	1.74	0.200	mg/kg wet	2.000		87	70-130	11	20	
Isopropylbenzene	1.94	0.200	mg/kg wet	2.000		97	70-130	4	20	
Methyl tert-Butyl Ether	2.23	0.200	mg/kg wet	2.000		112	70-130	3	20	
Methylene Chloride	2.19	0.400	mg/kg wet	2.000		110	70-130	7	20	
Naphthalene	1.85	0.200	mg/kg wet	2.000		92	70-130	4	20	
n-Butylbenzene	1.97	0.200	mg/kg wet	2.000		98	70-130	3	20	
n-Propylbenzene	2.00	0.200	mg/kg wet	2.000		100	70-130	5	20	
sec-Butylbenzene	1.97	0.200	mg/kg wet	2.000		99	70-130	0.1	20	
Styrene	1.79	0.200	mg/kg wet	2.000		90	70-130	0.8	20	
tert-Butylbenzene	2.04	0.200	mg/kg wet	2.000		102	70-130	2	20	
Tertiary-amyl methyl ether	2.32	0.200	mg/kg wet	2.000		116	70-130	6	20	
Tetrachloroethene	1.64	0.200	mg/kg wet	2.000		82	70-130	3	20	
Tetrahydrofuran	2.19	1.00	mg/kg wet	2.000		109	70-130	6	20	
Toluene	2.19	0.200	mg/kg wet	2.000		110	70-130	8	20	
trans-1,2-Dichloroethene	2.30	0.200	mg/kg wet	2.000		115	70-130	5	20	
trans-1,3-Dichloropropene	1.89	0.200	mg/kg wet	2.000		95	70-130	2	20	
Trichloroethene	2.23	0.200	mg/kg wet	2.000		111	70-130	8	20	
Trichlorofluoromethane	2.57	0.200	mg/kg wet	2.000		128	70-130	4	20	
Vinyl Chloride	1.92	0.200	mg/kg wet	2.000		96	70-130	12	20	
Xylene O	1.88	0.200	mg/kg wet	2.000		94	70-130	2	20	
Xylene P,M	3.79	0.400	mg/kg wet	4.000		95	70-130	1	20	
Surrogate: 1,2-Dichloroethane-d4	*5.32*		mg/kg wet	*5.000*		*106*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.87*		mg/kg wet	*5.000*		*97*	*70-130*			
Surrogate: Dibromofluoromethane	*5.75*		mg/kg wet	*5.000*		*115*	*70-130*			
Surrogate: Toluene-d8	*4.79*		mg/kg wet	*5.000*		*96*	*70-130*			
8015C Diesel Range Organics										
Batch CA01348 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Diesel Range Organics (C10-C28)	ND	15.0	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8015C Diesel Range Organics										
Batch CA01348 - 3546										
Surrogate: O-Terphenyl	*4.71*		mg/kg wet	*5.000*		*94*	*40-140*			
LCS										
Decane (C10)	1.7	0.2	mg/kg wet	2.500		69	40-140			
Diesel Range Organics (C10-C28)	23.4	15.0	mg/kg wet	27.50		85	40-140			
Docosane (C22)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		74	40-140			
Eicosane (C20)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Hexacosane (C26)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Hexadecane (C16)	2.0	0.2	mg/kg wet	2.500		81	40-140			
Nonadecane (C19)	2.6	0.2	mg/kg wet	2.500		102	40-140			
Octacosane (C28)	2.3	0.2	mg/kg wet	2.500		90	40-140			
Octadecane (C18)	2.2	0.2	mg/kg wet	2.500		86	40-140			
Tetracosane (C24)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Tetradecane (C14)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Surrogate: O-Terphenyl	*4.52*		mg/kg wet	*5.000*		*90*	*40-140*			
LCS Dup										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		73	40-140	6	25	
Diesel Range Organics (C10-C28)	24.1	15.0	mg/kg wet	27.50		88	40-140	3	25	
Docosane (C22)	2.3	0.2	mg/kg wet	2.500		91	40-140	2	25	
Dodecane (C12)	2.0	0.2	mg/kg wet	2.500		78	40-140	5	25	
Eicosane (C20)	2.3	0.2	mg/kg wet	2.500		90	40-140	1	25	
Hexacosane (C26)	2.3	0.2	mg/kg wet	2.500		91	40-140	2	25	
Hexadecane (C16)	2.1	0.2	mg/kg wet	2.500		84	40-140	4	25	
Nonadecane (C19)	2.6	0.2	mg/kg wet	2.500		105	40-140	2	25	
Octacosane (C28)	2.3	0.2	mg/kg wet	2.500		92	40-140	2	25	
Octadecane (C18)	2.2	0.2	mg/kg wet	2.500		88	40-140	2	25	
Tetracosane (C24)	2.3	0.2	mg/kg wet	2.500		91	40-140	2	25	
Tetradecane (C14)	2.0	0.2	mg/kg wet	2.500		81	40-140	5	25	
Surrogate: O-Terphenyl	*4.53*		mg/kg wet	*5.000*		*91*	*40-140*			
8081B Organochlorine Pesticides										
Batch CA01346 - 3546										
Blank										
4,4´-DDD	ND	0.0025	mg/kg wet							
4,4´-DDD [2C]	ND	0.0025	mg/kg wet							
4,4´-DDE	ND	0.0025	mg/kg wet							
4,4´-DDE [2C]	ND	0.0025	mg/kg wet							
4,4´-DDT	ND	0.0025	mg/kg wet							
4,4´-DDT [2C]	ND	0.0025	mg/kg wet							
Aldrin	ND	0.0025	mg/kg wet							
Aldrin [2C]	ND	0.0025	mg/kg wet							
alpha-BHC	ND	0.0025	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
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ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CA01346 - 3546										
alpha-BHC [2C]	ND	0.0025	mg/kg wet							
alpha-Chlordane	ND	0.0025	mg/kg wet							
alpha-Chlordane [2C]	ND	0.0025	mg/kg wet							
beta-BHC	ND	0.0025	mg/kg wet							
beta-BHC [2C]	ND	0.0025	mg/kg wet							
Chlordane (Total)	ND	0.0200	mg/kg wet							
Chlordane (Total) [2C]	ND	0.0200	mg/kg wet							
delta-BHC	ND	0.0025	mg/kg wet							
delta-BHC [2C]	ND	0.0025	mg/kg wet							
Dieldrin	ND	0.0025	mg/kg wet							
Dieldrin [2C]	ND	0.0025	mg/kg wet							
Endosulfan I	ND	0.0025	mg/kg wet							
Endosulfan I [2C]	ND	0.0025	mg/kg wet							
Endosulfan II	ND	0.0025	mg/kg wet							
Endosulfan II [2C]	ND	0.0025	mg/kg wet							
Endosulfan Sulfate	ND	0.0025	mg/kg wet							
Endosulfan Sulfate [2C]	ND	0.0025	mg/kg wet							
Endrin	ND	0.0025	mg/kg wet							
Endrin [2C]	ND	0.0025	mg/kg wet							
Endrin Ketone	ND	0.0025	mg/kg wet							
Endrin Ketone [2C]	ND	0.0025	mg/kg wet							
gamma-BHC (Lindane)	ND	0.0015	mg/kg wet							
gamma-BHC (Lindane) [2C]	ND	0.0015	mg/kg wet							
gamma-Chlordane	ND	0.0025	mg/kg wet							
gamma-Chlordane [2C]	ND	0.0025	mg/kg wet							
Heptachlor	ND	0.0025	mg/kg wet							
Heptachlor [2C]	ND	0.0025	mg/kg wet							
Heptachlor Epoxide	ND	0.0025	mg/kg wet							
Heptachlor Epoxide [2C]	ND	0.0025	mg/kg wet							
Hexachlorobenzene	ND	0.0025	mg/kg wet							
Hexachlorobenzene [2C]	ND	0.0025	mg/kg wet							
Methoxychlor	ND	0.0025	mg/kg wet							
Methoxychlor [2C]	ND	0.0025	mg/kg wet							
Toxaphene	ND	0.125	mg/kg wet							
Toxaphene [2C]	ND	0.125	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.00993*		mg/kg wet	*0.01250*		*79*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0100*		mg/kg wet	*0.01250*		*80*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0125*		mg/kg wet	*0.01250*		*100*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0124*		mg/kg wet	*0.01250*		*99*	*30-150*			
LCS										
4,4´-DDD	0.0135	0.0025	mg/kg wet	0.01250		108	40-140			
4,4´-DDD [2C]	0.0138	0.0025	mg/kg wet	0.01250		110	40-140			
4,4´-DDE	0.0131	0.0025	mg/kg wet	0.01250		105	40-140			
4,4´-DDE [2C]	0.0149	0.0025	mg/kg wet	0.01250		119	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

8081B Organochlorine Pesticides

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CA01346 - 3546										
4,4´-DDT	0.0138	0.0025	mg/kg wet	0.01250		110	40-140			
4,4´-DDT [2C]	0.0141	0.0025	mg/kg wet	0.01250		113	40-140			
Aldrin	0.0130	0.0025	mg/kg wet	0.01250		104	40-140			
Aldrin [2C]	0.0136	0.0025	mg/kg wet	0.01250		109	40-140			
alpha-BHC	0.0130	0.0025	mg/kg wet	0.01250		104	40-140			
alpha-BHC [2C]	0.0132	0.0025	mg/kg wet	0.01250		105	40-140			
alpha-Chlordane	0.0124	0.0025	mg/kg wet	0.01250		99	40-140			
alpha-Chlordane [2C]	0.0129	0.0025	mg/kg wet	0.01250		103	40-140			
beta-BHC	0.0130	0.0025	mg/kg wet	0.01250		104	40-140			
beta-BHC [2C]	0.0134	0.0025	mg/kg wet	0.01250		107	40-140			
delta-BHC	0.0101	0.0025	mg/kg wet	0.01250		81	40-140			
delta-BHC [2C]	0.0101	0.0025	mg/kg wet	0.01250		80	40-140			
Dieldrin	0.0136	0.0025	mg/kg wet	0.01250		108	40-140			
Dieldrin [2C]	0.0143	0.0025	mg/kg wet	0.01250		114	40-140			
Endosulfan I	0.0124	0.0025	mg/kg wet	0.01250		100	40-140			
Endosulfan I [2C]	0.0129	0.0025	mg/kg wet	0.01250		103	40-140			
Endosulfan II	0.0126	0.0025	mg/kg wet	0.01250		101	40-140			
Endosulfan II [2C]	0.0136	0.0025	mg/kg wet	0.01250		109	40-140			
Endosulfan Sulfate	0.0127	0.0025	mg/kg wet	0.01250		101	40-140			
Endosulfan Sulfate [2C]	0.0130	0.0025	mg/kg wet	0.01250		104	40-140			
Endrin	0.0133	0.0025	mg/kg wet	0.01250		106	40-140			
Endrin [2C]	0.0138	0.0025	mg/kg wet	0.01250		110	40-140			
Endrin Ketone	0.0136	0.0025	mg/kg wet	0.01250		109	40-140			
Endrin Ketone [2C]	0.0143	0.0025	mg/kg wet	0.01250		115	40-140			
gamma-BHC (Lindane)	0.0127	0.0015	mg/kg wet	0.01250		102	40-140			
gamma-BHC (Lindane) [2C]	0.0131	0.0015	mg/kg wet	0.01250		105	40-140			
gamma-Chlordane	0.0127	0.0025	mg/kg wet	0.01250		102	40-140			
gamma-Chlordane [2C]	0.0131	0.0025	mg/kg wet	0.01250		105	40-140			
Heptachlor	0.0128	0.0025	mg/kg wet	0.01250		102	40-140			
Heptachlor [2C]	0.0132	0.0025	mg/kg wet	0.01250		105	40-140			
Heptachlor Epoxide	0.0135	0.0025	mg/kg wet	0.01250		108	40-140			
Heptachlor Epoxide [2C]	0.0140	0.0025	mg/kg wet	0.01250		112	40-140			
Hexachlorobenzene	0.0127	0.0025	mg/kg wet	0.01250		101	40-140			
Hexachlorobenzene [2C]	0.0126	0.0025	mg/kg wet	0.01250		101	40-140			
Methoxychlor	0.0124	0.0025	mg/kg wet	0.01250		99	40-140			
Methoxychlor [2C]	0.0133	0.0025	mg/kg wet	0.01250		106	40-140			
Surrogate: Decachlorobiphenyl	*0.0137*		mg/kg wet	*0.01250*		*110*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0139*		mg/kg wet	*0.01250*		*112*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0134*		mg/kg wet	*0.01250*		*107*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0132*		mg/kg wet	*0.01250*		*106*	*30-150*			
LCS Dup										
4,4´-DDD	0.0135	0.0025	mg/kg wet	0.01250		108	40-140	0.7	30	
4,4´-DDD [2C]	0.0139	0.0025	mg/kg wet	0.01250		111	40-140	0.7	30	
4,4´-DDE	0.0133	0.0025	mg/kg wet	0.01250		107	40-140	1	30	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CA01346 - 3546										
4,4´-DDE [2C]	0.0151	0.0025	mg/kg wet	0.01250		120	40-140	1	30	
4,4´-DDT	0.0143	0.0025	mg/kg wet	0.01250		114	40-140	3	30	
4,4´-DDT [2C]	0.0143	0.0025	mg/kg wet	0.01250		114	40-140	1	30	
Aldrin	0.0133	0.0025	mg/kg wet	0.01250		106	40-140	2	30	
Aldrin [2C]	0.0138	0.0025	mg/kg wet	0.01250		110	40-140	2	30	
alpha-BHC	0.0133	0.0025	mg/kg wet	0.01250		106	40-140	2	30	
alpha-BHC [2C]	0.0134	0.0025	mg/kg wet	0.01250		107	40-140	2	30	
alpha-Chlordane	0.0126	0.0025	mg/kg wet	0.01250		101	40-140	2	30	
alpha-Chlordane [2C]	0.0131	0.0025	mg/kg wet	0.01250		105	40-140	1	30	
beta-BHC	0.0131	0.0025	mg/kg wet	0.01250		105	40-140	0.6	30	
beta-BHC [2C]	0.0141	0.0025	mg/kg wet	0.01250		113	40-140	5	30	
delta-BHC	0.0103	0.0025	mg/kg wet	0.01250		83	40-140	2	30	
delta-BHC [2C]	0.0102	0.0025	mg/kg wet	0.01250		82	40-140	1	30	
Dieldrin	0.0137	0.0025	mg/kg wet	0.01250		110	40-140	1	30	
Dieldrin [2C]	0.0144	0.0025	mg/kg wet	0.01250		116	40-140	1	30	
Endosulfan I	0.0127	0.0025	mg/kg wet	0.01250		101	40-140	2	30	
Endosulfan I [2C]	0.0131	0.0025	mg/kg wet	0.01250		105	40-140	2	30	
Endosulfan II	0.0128	0.0025	mg/kg wet	0.01250		103	40-140	2	30	
Endosulfan II [2C]	0.0137	0.0025	mg/kg wet	0.01250		110	40-140	1	30	
Endosulfan Sulfate	0.0129	0.0025	mg/kg wet	0.01250		103	40-140	2	30	
Endosulfan Sulfate [2C]	0.0132	0.0025	mg/kg wet	0.01250		106	40-140	2	30	
Endrin	0.0134	0.0025	mg/kg wet	0.01250		107	40-140	0.7	30	
Endrin [2C]	0.0139	0.0025	mg/kg wet	0.01250		112	40-140	1	30	
Endrin Ketone	0.0139	0.0025	mg/kg wet	0.01250		111	40-140	2	30	
Endrin Ketone [2C]	0.0146	0.0025	mg/kg wet	0.01250		116	40-140	2	30	
gamma-BHC (Lindane)	0.0129	0.0015	mg/kg wet	0.01250		104	40-140	2	30	
gamma-BHC (Lindane) [2C]	0.0134	0.0015	mg/kg wet	0.01250		107	40-140	2	30	
gamma-Chlordane	0.0129	0.0025	mg/kg wet	0.01250		103	40-140	2	30	
gamma-Chlordane [2C]	0.0133	0.0025	mg/kg wet	0.01250		106	40-140	1	30	
Heptachlor	0.0130	0.0025	mg/kg wet	0.01250		104	40-140	2	30	
Heptachlor [2C]	0.0134	0.0025	mg/kg wet	0.01250		107	40-140	2	30	
Heptachlor Epoxide	0.0137	0.0025	mg/kg wet	0.01250		110	40-140	2	30	
Heptachlor Epoxide [2C]	0.0142	0.0025	mg/kg wet	0.01250		113	40-140	1	30	
Hexachlorobenzene	0.0128	0.0025	mg/kg wet	0.01250		103	40-140	1	30	
Hexachlorobenzene [2C]	0.0128	0.0025	mg/kg wet	0.01250		102	40-140	2	30	
Methoxychlor	0.0128	0.0025	mg/kg wet	0.01250		103	40-140	3	30	
Methoxychlor [2C]	0.0135	0.0025	mg/kg wet	0.01250		108	40-140	2	30	
Surrogate: Decachlorobiphenyl	*0.0134*		mg/kg wet	*0.01250*		*107*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0137*		mg/kg wet	*0.01250*		*109*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0131*		mg/kg wet	*0.01250*		*104*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0130*		mg/kg wet	*0.01250*		*104*	*30-150*			
8082A Polychlorinated Biphenyls (PCB)										
Batch CA01342 - 3540C										

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch CA01342 - 3540C										
Blank										
Aroclor 1016	ND	0.02	mg/kg wet							
Aroclor 1016 [2C]	ND	0.02	mg/kg wet							
Aroclor 1221	ND	0.02	mg/kg wet							
Aroclor 1221 [2C]	ND	0.02	mg/kg wet							
Aroclor 1232	ND	0.02	mg/kg wet							
Aroclor 1232 [2C]	ND	0.02	mg/kg wet							
Aroclor 1242	ND	0.02	mg/kg wet							
Aroclor 1242 [2C]	ND	0.02	mg/kg wet							
Aroclor 1248	ND	0.02	mg/kg wet							
Aroclor 1248 [2C]	ND	0.02	mg/kg wet							
Aroclor 1254	ND	0.02	mg/kg wet							
Aroclor 1254 [2C]	ND	0.02	mg/kg wet							
Aroclor 1260	ND	0.02	mg/kg wet							
Aroclor 1260 [2C]	ND	0.02	mg/kg wet							
Aroclor 1262	ND	0.02	mg/kg wet							
Aroclor 1262 [2C]	ND	0.02	mg/kg wet							
Aroclor 1268	ND	0.02	mg/kg wet							
Aroclor 1268 [2C]	ND	0.02	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0264*		mg/kg wet	*0.02500*		*106*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0282*		mg/kg wet	*0.02500*		*113*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0220*		mg/kg wet	*0.02500*		*88*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0253*		mg/kg wet	*0.02500*		*101*	*30-150*			
LCS										
Aroclor 1016	0.5	0.02	mg/kg wet	0.5000		96	40-140			
Aroclor 1016 [2C]	0.5	0.02	mg/kg wet	0.5000		94	40-140			
Aroclor 1260	0.5	0.02	mg/kg wet	0.5000		93	40-140			
Aroclor 1260 [2C]	0.5	0.02	mg/kg wet	0.5000		98	40-140			
Surrogate: Decachlorobiphenyl	*0.0273*		mg/kg wet	*0.02500*		*109*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0291*		mg/kg wet	*0.02500*		*117*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0236*		mg/kg wet	*0.02500*		*95*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0255*		mg/kg wet	*0.02500*		*102*	*30-150*			
LCS Dup										
Aroclor 1016	0.5	0.02	mg/kg wet	0.5000		92	40-140	4	30	
Aroclor 1016 [2C]	0.5	0.02	mg/kg wet	0.5000		91	40-140	4	30	
Aroclor 1260	0.4	0.02	mg/kg wet	0.5000		90	40-140	3	30	
Aroclor 1260 [2C]	0.5	0.02	mg/kg wet	0.5000		95	40-140	3	30	
Surrogate: Decachlorobiphenyl	*0.0260*		mg/kg wet	*0.02500*		*104*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0275*		mg/kg wet	*0.02500*		*110*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0222*		mg/kg wet	*0.02500*		*89*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0240*		mg/kg wet	*0.02500*		*96*	*30-150*			
8151A Chlorinated Herbicides										

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Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8151A Chlorinated Herbicides										
Batch CA01374 - 3546										
Blank										
2,4,5-T	ND	0.010	mg/kg wet							
2,4,5-T [2C]	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex)	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex) [2C]	ND	0.010	mg/kg wet							
2,4-D	ND	0.047	mg/kg wet							
2,4-D [2C]	ND	0.047	mg/kg wet							
2,4-DB	ND	0.048	mg/kg wet							
2,4-DB [2C]	ND	0.048	mg/kg wet							
Dalapon	ND	0.046	mg/kg wet							
Dalapon [2C]	ND	0.046	mg/kg wet							
Dicamba	ND	0.009	mg/kg wet							
Dicamba [2C]	ND	0.009	mg/kg wet							
Dichlorprop	ND	0.047	mg/kg wet							
Dichlorprop [2C]	ND	0.047	mg/kg wet							
Dinoseb	ND	0.048	mg/kg wet							
Dinoseb [2C]	ND	0.048	mg/kg wet							
MCPA	ND	2.32	mg/kg wet							
MCPA [2C]	ND	2.32	mg/kg wet							
MCPP	ND	2.35	mg/kg wet							
MCPP [2C]	ND	2.35	mg/kg wet							
Surrogate: DCAA	*0.212*		mg/kg wet	*0.2000*		*106*	*30-150*			
Surrogate: DCAA [2C]	*0.204*		mg/kg wet	*0.2000*		*102*	*30-150*			
LCS										
2,4,5-T	0.014	0.010	mg/kg wet	0.01900		72	40-140			
2,4,5-T [2C]	0.013	0.010	mg/kg wet	0.01900		68	40-140			
2,4,5-TP (Silvex)	0.014	0.010	mg/kg wet	0.01900		72	40-140			
2,4,5-TP (Silvex) [2C]	0.013	0.010	mg/kg wet	0.01900		66	40-140			
2,4-D	0.130	0.047	mg/kg wet	0.1880		69	40-140			
2,4-D [2C]	0.129	0.047	mg/kg wet	0.1880		69	40-140			
2,4-DB	0.145	0.048	mg/kg wet	0.1900		76	40-140			
2,4-DB [2C]	0.133	0.048	mg/kg wet	0.1900		70	40-140			
Dalapon	0.266	0.046	mg/kg wet	0.4550		58	40-140			
Dalapon [2C]	0.261	0.046	mg/kg wet	0.4550		57	40-140			
Dicamba	0.013	0.009	mg/kg wet	0.01880		68	40-140			
Dicamba [2C]	0.012	0.009	mg/kg wet	0.01880		64	40-140			
Dichlorprop	0.134	0.047	mg/kg wet	0.1880		71	40-140			
Dichlorprop [2C]	0.130	0.047	mg/kg wet	0.1880		69	40-140			
Dinoseb	0.011	0.048	mg/kg wet	0.09500		12	10-100			
Dinoseb [2C]	0.014	0.048	mg/kg wet	0.09500		14	10-100			
MCPA	12.3	2.32	mg/kg wet	18.60		66	40-140			
MCPA [2C]	13.6	2.32	mg/kg wet	18.60		73	40-140			
MCPP	13.1	2.35	mg/kg wet	18.80		70	40-140			
MCPP [2C]	13.5	2.35	mg/kg wet	18.80		72	40-140			

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Client Name: GZA GeoEnvironmental, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8151A Chlorinated Herbicides										
Batch CA01374 - 3546										
Surrogate: DCAA	*0.193*		mg/kg wet	*0.2000*		*96*	*30-150*			
Surrogate: DCAA [2C]	*0.184*		mg/kg wet	*0.2000*		*92*	*30-150*			
LCS Dup										
2,4,5-T	0.017	0.010	mg/kg wet	0.01900		90	40-140	22	30	
2,4,5-T [2C]	0.015	0.010	mg/kg wet	0.01900		80	40-140	16	30	
2,4,5-TP (Silvex)	0.017	0.010	mg/kg wet	0.01900		88	40-140	20	30	
2,4,5-TP (Silvex) [2C]	0.015	0.010	mg/kg wet	0.01900		80	40-140	19	30	
2,4-D	0.152	0.047	mg/kg wet	0.1880		81	40-140	15	30	
2,4-D [2C]	0.156	0.047	mg/kg wet	0.1880		83	40-140	18	30	
2,4-DB	0.174	0.048	mg/kg wet	0.1900		92	40-140	18	30	
2,4-DB [2C]	0.157	0.048	mg/kg wet	0.1900		83	40-140	17	30	
Dalapon	0.350	0.046	mg/kg wet	0.4550		77	40-140	27	30	
Dalapon [2C]	0.345	0.046	mg/kg wet	0.4550		76	40-140	28	30	
Dicamba	0.016	0.009	mg/kg wet	0.01880		84	40-140	21	30	
Dicamba [2C]	0.015	0.009	mg/kg wet	0.01880		78	40-140	20	30	
Dichlorprop	0.163	0.047	mg/kg wet	0.1880		87	40-140	20	30	
Dichlorprop [2C]	0.153	0.047	mg/kg wet	0.1880		81	40-140	16	30	
Dinoseb	0.014	0.048	mg/kg wet	0.09500		15	10-100	24	30	
Dinoseb [2C]	0.016	0.048	mg/kg wet	0.09500		17	10-100	15	30	
MCPA	14.7	2.32	mg/kg wet	18.60		79	40-140	18	30	
MCPA [2C]	15.3	2.32	mg/kg wet	18.60		82	40-140	12	30	
MCPP	17.1	2.35	mg/kg wet	18.80		91	40-140	27	30	
MCPP [2C]	16.3	2.35	mg/kg wet	18.80		87	40-140	19	30	
Surrogate: DCAA	*0.218*		mg/kg wet	*0.2000*		*109*	*30-150*			
Surrogate: DCAA [2C]	*0.200*		mg/kg wet	*0.2000*		*100*	*30-150*			
8270D Semi-Volatile Organic Compounds										
Batch CA01347 - 3546										
Blank										
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							

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Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CA01347 - 3546										
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.667	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	1.67	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.333	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.26*		mg/kg wet	*3.333*		*68*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
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ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CA01347 - 3546										
Surrogate: 2,4,6-Tribromophenol	*3.20*		mg/kg wet	*5.000*		*64*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.57*		mg/kg wet	*5.000*		*71*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.25*		mg/kg wet	*3.333*		*67*	*30-130*			
Surrogate: 2-Fluorophenol	*3.48*		mg/kg wet	*5.000*		*70*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.36*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: Phenol-d6	*3.64*		mg/kg wet	*5.000*		*73*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.43*		mg/kg wet	*3.333*		*73*	*30-130*			
LCS										
1,2,4-Trichlorobenzene	2.18	0.333	mg/kg wet	3.333		66	40-140			
1,2-Dichlorobenzene	2.22	0.333	mg/kg wet	3.333		67	40-140			
1,3-Dichlorobenzene	2.27	0.333	mg/kg wet	3.333		68	40-140			
1,4-Dichlorobenzene	2.15	0.333	mg/kg wet	3.333		64	40-140			
2,4,5-Trichlorophenol	2.68	0.333	mg/kg wet	3.333		81	30-130			
2,4,6-Trichlorophenol	2.43	0.333	mg/kg wet	3.333		73	30-130			
2,4-Dichlorophenol	2.43	0.333	mg/kg wet	3.333		73	30-130			
2,4-Dimethylphenol	2.33	0.333	mg/kg wet	3.333		70	30-130			
2,4-Dinitrophenol	3.19	1.67	mg/kg wet	3.333		96	30-130			
2,4-Dinitrotoluene	3.08	0.333	mg/kg wet	3.333		92	40-140			
2,6-Dinitrotoluene	2.76	0.333	mg/kg wet	3.333		83	40-140			
2-Chloronaphthalene	2.07	0.333	mg/kg wet	3.333		62	40-140			
2-Chlorophenol	2.37	0.333	mg/kg wet	3.333		71	30-130			
2-Methylnaphthalene	2.16	0.333	mg/kg wet	3.333		65	40-140			
2-Methylphenol	2.46	0.333	mg/kg wet	3.333		74	30-130			
2-Nitrophenol	2.26	0.333	mg/kg wet	3.333		68	30-130			
3,3´-Dichlorobenzidine	2.10	0.667	mg/kg wet	3.333		63	40-140			
3+4-Methylphenol	4.71	0.667	mg/kg wet	6.667		71	30-130			
4-Bromophenyl-phenylether	2.54	0.333	mg/kg wet	3.333		76	40-140			
4-Chloroaniline	1.25	0.667	mg/kg wet	3.333		38	40-140			B-
4-Nitrophenol	2.82	1.67	mg/kg wet	3.333		85	30-130			
Acenaphthene	2.20	0.333	mg/kg wet	3.333		66	40-140			
Acenaphthylene	2.22	0.333	mg/kg wet	3.333		66	40-140			
Acetophenone	2.27	0.667	mg/kg wet	3.333		68	40-140			
Aniline	1.70	1.67	mg/kg wet	3.333		51	40-140			
Anthracene	2.56	0.333	mg/kg wet	3.333		77	40-140			
Azobenzene	2.49	0.333	mg/kg wet	3.333		75	40-140			
Benzo(a)anthracene	2.88	0.333	mg/kg wet	3.333		86	40-140			
Benzo(a)pyrene	2.95	0.167	mg/kg wet	3.333		88	40-140			
Benzo(b)fluoranthene	3.11	0.333	mg/kg wet	3.333		93	40-140			
Benzo(g,h,i)perylene	2.89	0.333	mg/kg wet	3.333		87	40-140			
Benzo(k)fluoranthene	2.56	0.333	mg/kg wet	3.333		77	40-140			
bis(2-Chloroethoxy)methane	2.20	0.333	mg/kg wet	3.333		66	40-140			
bis(2-Chloroethyl)ether	2.28	0.333	mg/kg wet	3.333		68	40-140			
bis(2-chloroisopropyl)Ether	2.31	0.333	mg/kg wet	3.333		69	40-140			
bis(2-Ethylhexyl)phthalate	2.73	0.333	mg/kg wet	3.333		82	40-140			
Butylbenzylphthalate	2.76	0.333	mg/kg wet	3.333		83	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CA01347 - 3546										
Chrysene	2.74	0.167	mg/kg wet	3.333		82	40-140			
Dibenzo(a,h)Anthracene	2.80	0.167	mg/kg wet	3.333		84	40-140			
Dibenzofuran	2.31	0.333	mg/kg wet	3.333		69	40-140			
Diethylphthalate	2.84	0.333	mg/kg wet	3.333		85	40-140			
Dimethylphthalate	2.61	0.333	mg/kg wet	3.333		78	40-140			
Di-n-butylphthalate	2.95	0.333	mg/kg wet	3.333		89	40-140			
Di-n-octylphthalate	3.02	0.333	mg/kg wet	3.333		91	40-140			
Fluoranthene	2.88	0.333	mg/kg wet	3.333		86	40-140			
Fluorene	2.47	0.333	mg/kg wet	3.333		74	40-140			
Hexachlorobenzene	2.56	0.333	mg/kg wet	3.333		77	40-140			
Hexachlorobutadiene	2.24	0.333	mg/kg wet	3.333		67	40-140			
Hexachloroethane	2.12	0.333	mg/kg wet	3.333		64	40-140			
Indeno(1,2,3-cd)Pyrene	2.77	0.333	mg/kg wet	3.333		83	40-140			
Isophorone	2.06	0.333	mg/kg wet	3.333		62	40-140			
Naphthalene	2.12	0.333	mg/kg wet	3.333		64	40-140			
Nitrobenzene	2.19	0.333	mg/kg wet	3.333		66	40-140			
N-Nitrosodimethylamine	2.17	0.333	mg/kg wet	3.333		65	40-140			
Pentachlorophenol	3.09	1.67	mg/kg wet	3.333		93	30-130			
Phenanthrene	2.62	0.333	mg/kg wet	3.333		78	40-140			
Phenol	2.43	0.333	mg/kg wet	3.333		73	30-130			
Pyrene	2.73	0.333	mg/kg wet	3.333		82	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.32*		mg/kg wet	*3.333*		*70*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.17*		mg/kg wet	*5.000*		*83*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.71*		mg/kg wet	*5.000*		*74*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.28*		mg/kg wet	*3.333*		*68*	*30-130*			
Surrogate: 2-Fluorophenol	*3.69*		mg/kg wet	*5.000*		*74*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.37*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: Phenol-d6	*3.84*		mg/kg wet	*5.000*		*77*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.82*		mg/kg wet	*3.333*		*85*	*30-130*			
LCS Dup										
1,2,4-Trichlorobenzene	1.85	0.333	mg/kg wet	3.333		55	40-140	17	30	
1,2-Dichlorobenzene	1.82	0.333	mg/kg wet	3.333		54	40-140	20	30	
1,3-Dichlorobenzene	1.90	0.333	mg/kg wet	3.333		57	40-140	18	30	
1,4-Dichlorobenzene	1.77	0.333	mg/kg wet	3.333		53	40-140	19	30	
2,4,5-Trichlorophenol	2.17	0.333	mg/kg wet	3.333		65	30-130	21	30	
2,4,6-Trichlorophenol	2.07	0.333	mg/kg wet	3.333		62	30-130	16	30	
2,4-Dichlorophenol	2.07	0.333	mg/kg wet	3.333		62	30-130	16	30	
2,4-Dimethylphenol	2.02	0.333	mg/kg wet	3.333		60	30-130	14	30	
2,4-Dinitrophenol	2.77	1.67	mg/kg wet	3.333		83	30-130	14	30	
2,4-Dinitrotoluene	2.70	0.333	mg/kg wet	3.333		81	40-140	13	30	
2,6-Dinitrotoluene	2.27	0.333	mg/kg wet	3.333		68	40-140	20	30	
2-Chloronaphthalene	1.83	0.333	mg/kg wet	3.333		55	40-140	12	30	
2-Chlorophenol	2.00	0.333	mg/kg wet	3.333		60	30-130	17	30	
2-Methylnaphthalene	1.84	0.333	mg/kg wet	3.333		55	40-140	16	30	
2-Methylphenol	2.08	0.333	mg/kg wet	3.333		63	30-130	16	30	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CA01347 - 3546										
2-Nitrophenol	1.89	0.333	mg/kg wet	3.333		57	30-130	18	30	
3,3´-Dichlorobenzidine	1.77	0.667	mg/kg wet	3.333		53	40-140	17	30	
3+4-Methylphenol	4.09	0.667	mg/kg wet	6.667		61	30-130	14	30	
4-Bromophenyl-phenylether	1.99	0.333	mg/kg wet	3.333		60	40-140	24	30	
4-Chloroaniline	0.987	0.667	mg/kg wet	3.333		30	40-140	24	30	B-
4-Nitrophenol	2.41	1.67	mg/kg wet	3.333		72	30-130	16	30	
Acenaphthene	1.87	0.333	mg/kg wet	3.333		56	40-140	16	30	
Acenaphthylene	1.91	0.333	mg/kg wet	3.333		57	40-140	15	30	
Acetophenone	1.96	0.667	mg/kg wet	3.333		59	40-140	15	30	
Aniline	1.39	1.67	mg/kg wet	3.333		42	40-140	20	30	
Anthracene	2.14	0.333	mg/kg wet	3.333		64	40-140	18	30	
Azobenzene	1.95	0.333	mg/kg wet	3.333		59	40-140	24	30	
Benzo(a)anthracene	2.36	0.333	mg/kg wet	3.333		71	40-140	20	30	
Benzo(a)pyrene	2.44	0.167	mg/kg wet	3.333		73	40-140	19	30	
Benzo(b)fluoranthene	2.40	0.333	mg/kg wet	3.333		72	40-140	26	30	
Benzo(g,h,i)perylene	2.47	0.333	mg/kg wet	3.333		74	40-140	16	30	
Benzo(k)fluoranthene	2.24	0.333	mg/kg wet	3.333		67	40-140	13	30	
bis(2-Chloroethoxy)methane	1.86	0.333	mg/kg wet	3.333		56	40-140	16	30	
bis(2-Chloroethyl)ether	1.91	0.333	mg/kg wet	3.333		57	40-140	17	30	
bis(2-chloroisopropyl)Ether	1.86	0.333	mg/kg wet	3.333		56	40-140	22	30	
bis(2-Ethylhexyl)phthalate	2.21	0.333	mg/kg wet	3.333		66	40-140	21	30	
Butylbenzylphthalate	2.22	0.333	mg/kg wet	3.333		67	40-140	22	30	
Chrysene	2.28	0.167	mg/kg wet	3.333		68	40-140	18	30	
Dibenzo(a,h)Anthracene	2.39	0.167	mg/kg wet	3.333		72	40-140	16	30	
Dibenzofuran	1.94	0.333	mg/kg wet	3.333		58	40-140	17	30	
Diethylphthalate	2.36	0.333	mg/kg wet	3.333		71	40-140	18	30	
Dimethylphthalate	2.17	0.333	mg/kg wet	3.333		65	40-140	18	30	
Di-n-butylphthalate	2.49	0.333	mg/kg wet	3.333		75	40-140	17	30	
Di-n-octylphthalate	2.33	0.333	mg/kg wet	3.333		70	40-140	26	30	
Fluoranthene	2.48	0.333	mg/kg wet	3.333		74	40-140	15	30	
Fluorene	2.10	0.333	mg/kg wet	3.333		63	40-140	16	30	
Hexachlorobenzene	2.09	0.333	mg/kg wet	3.333		63	40-140	20	30	
Hexachlorobutadiene	1.87	0.333	mg/kg wet	3.333		56	40-140	18	30	
Hexachloroethane	1.73	0.333	mg/kg wet	3.333		52	40-140	21	30	
Indeno(1,2,3-cd)Pyrene	2.39	0.333	mg/kg wet	3.333		72	40-140	15	30	
Isophorone	1.76	0.333	mg/kg wet	3.333		53	40-140	16	30	
Naphthalene	1.79	0.333	mg/kg wet	3.333		54	40-140	17	30	
Nitrobenzene	1.90	0.333	mg/kg wet	3.333		57	40-140	14	30	
N-Nitrosodimethylamine	1.75	0.333	mg/kg wet	3.333		52	40-140	21	30	
Pentachlorophenol	2.54	1.67	mg/kg wet	3.333		76	30-130	19	30	
Phenanthrene	2.14	0.333	mg/kg wet	3.333		64	40-140	20	30	
Phenol	2.07	0.333	mg/kg wet	3.333		62	30-130	16	30	
Pyrene	2.21	0.333	mg/kg wet	3.333		66	40-140	21	30	
Surrogate: 1,2-Dichlorobenzene-d4	*1.91*		mg/kg wet	*3.333*		*57*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.31*		mg/kg wet	*5.000*		*66*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CA01347 - 3546										
Surrogate: 2-Chlorophenol-d4	*3.06*		mg/kg wet	*5.000*		*61*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.94*		mg/kg wet	*3.333*		*58*	*30-130*			
Surrogate: 2-Fluorophenol	*3.10*		mg/kg wet	*5.000*		*62*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.94*		mg/kg wet	*3.333*		*58*	*30-130*			
Surrogate: Phenol-d6	*3.19*		mg/kg wet	*5.000*		*64*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.19*		mg/kg wet	*3.333*		*66*	*30-130*			
Classical Chemistry										
Batch CA01458 - General Preparation										
Reference										
Flashpoint	81		°F	81.00		100	97.9-102.1			
Batch CA01571 - General Preparation										
Blank										
Conductivity	ND	5	umhos/cm							
LCS										
Conductivity	1390		umhos/cm	1411		99	90-110			
Batch DA01614 - General Preparation										
Blank										
Reactive Cyanide	ND	2.0	mg/kg							
Reactive Sulfide	ND	2.0	mg/kg							
LCS										
Reactive Cyanide	3.8	2.0	mg/kg	100.3		4	0.68-5.41			
Reactive Sulfide	ND	2.0	mg/kg	10.00		0	0-44			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street ESS Laboratory Work Order: 20A0294

Notes and Definitions

Z-10a	Soil pH measured in water at 20.2 ºC.
Z-10	Soil pH measured in water at 20.0 ºC.
Z-09	ND
XH	Peaks found in the retention time window for MCPP did not confirm by GC/MS.
WL	Results obtained from a deionized water leach of the sample.
U	Analyte included in the analysis, but not detected
SC	Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).
Q	Calibration required quadratic regression (Q).
E	Reported above the quantitation limit; Estimated value (E).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B-	Blank Spike recovery is below lower control limit (B-).
>	Greater than.
#	Modified result
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Malden 2 - Dartmouth Street

ESS Laboratory Work Order: 20A0294

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/KPB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20A0294
Date Received: 1/13/2020
Project Due Date: 1/19/2020
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? ~~No~~ N/A
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? (Yes) / No
    pH, ORP, LL vials

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? (Yes) / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 1/13/20 Time: 1720 By:

Sample Receiving Notes:

pH, ORP out of hold, No Indication LL vials Frozen

14. Was there a need to contact Project Manager? (Yes) / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Jay Hodkinson Date: 1/14/20 Time: By: LLB

Continue to run even outside of hold

LL vials were frozen but thawed over weekend per client

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	2516	Yes	N/A	Yes	VOA Vial	MeOH	
1	2518	Yes	N/A	Yes	VOA Vial	DI Water	
1	2519	Yes	N/A	Yes	VOA Vial	DI Water	
1	2522	Yes	N/A	Yes	2 oz. Jar	NP	
1	2524	Yes	N/A	Yes	4 oz. Jar	NP	
1	2526	Yes	N/A	Yes	8 oz jar	NP	
1	2527	Yes	N/A	Yes	8 oz jar	NP	
1	2528	Yes	N/A	Yes	8 oz jar	NP	
1	2553	Yes	N/A	Yes	4 oz. Jar	NP	
2	2517	Yes	N/A	Yes	VOA Vial	MeOH	
2	2520	Yes	N/A	Yes	VOA Vial	DI Water	
2	2521	Yes	N/A	Yes	VOA Vial	DI Water	
2	2523	Yes	N/A	Yes	2 oz. Jar	NP	
2	2525	Yes	N/A	Yes	4 oz. Jar	NP	
2	2529	Yes	N/A	Yes	8 oz jar	NP	
2	2530	Yes	N/A	Yes	8 oz jar	NP	
2	2531	Yes	N/A	Yes	8 oz jar	NP	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/KPB

ESS Project ID: 20A0294
Date Received: 1/13/2020

2	2554	Yes	N/A	Yes	4 oz. Jar	NP

2nd Review

Were all containers scanned into storage/lab? Initials _____ Yes / No

Are barcode labels on correct containers? Yes / No / NA

Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA

Are all Hex Chrome stickers attached? Yes / No / NA

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: _____ Date & Time: 1/13/20 1530

Reviewed By: _____ Date & Time: 1/13/20 1715

Delivered By: _____ 1/13/20 1715

CHAIN OF CUSTODY

ESS Lab # 20A0294

ESS Laboratory
Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston RI 02910
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

Turn Time: 5 Days
Regulatory State: MA
Is this project for any of the following?: ○ CT RCP ☒ MA MCP ○ RGP
Reporting Limits:
Electonic Deliverables: ☒ Data Checker ☒ Excel ☒ Other (Please Specify →) PDF

Company Name	Project #	Project Name
GZA	04.0191051.00	Malden 2 - Dartmouth Street

Contact Person	Address	PO #
Jay Hodkinson	5 Commerce Park North Suit 201	

City	State	Zip Code
Bedford	NH	03110

Telephone Number	FAX Number	Email Address
603-232-8742		Jay.Hodkinson@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis: VOCs	% Solids	ORP	Flash Point	MCP 14	SVOCs	Organic Pesticides	Chlorinated Herbicides	PCBs 35401/8082	Conductivity, pH	TPH - DRO	Reactive Cyanides Sulfides
1	1-8-20	10:15	C/G	Soil	GZ-1 : S-3	X	X	X	X	X	X	X	X	X	X	X	X
2	1-8-20	11:07	C/G	Soil	GZ-1 : S-10	X	X	X	X	X	X	X	X	X	X	X	X

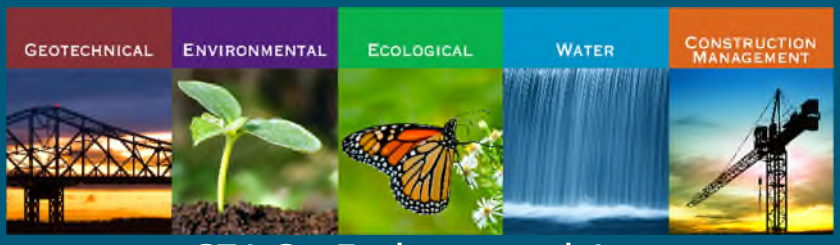
Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial	V	AG	AG	AG	AG						
Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*	7	8	9	9	10						
Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*	6	1	1	1	1						
Number of Containers per Sample:	3	1	1	1	3						

Laboratory Use Only
Cooler Present: ✓
Seals Intact: ✓
Cooler Temperature: °C ice temp; -0.3
○ Drop Off ○ Pickup

Sampled by: KK

Comments: Please specify "Other" preservative and containers types in this space
- VOC, flash Point, % Solids are grab samples - MCP Certification, S-1, GW-2
- TCLP on any compound which exceeds 20x rule

Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
1-10-20 1633	GZA Fridge	GZA Fridge 1/13/20 11:29	1/13/20 11:29
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
1/13/20 15:02	1/13/20 1502		



GZA GeoEnvironmental, Inc.