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REPORT

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DRAFT
Phase IV Remedy Implementation Plan
Special Project Designation Area Groundwater

Prepared for:
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EXECUTIVE SUMMARY

Weston & Sampson Engineers Inc. (Weston & Sampson), on behalf of the Massachusetts Division of Capital Asset Management and Maintenance (DCAMM), has prepared this Phase IV Remedy Implementation Plan (RIP) Modification for the Special Project Designation (SPD) Area groundwater (the Site) at the former Medfield State Hospital (MSH) in Medfield Massachusetts (see Figure 1). This RIP modification has been prepared in accordance with the requirements of the Massachusetts Contingency Plan (MCP), 310 CMR 40.0874, and is subject to the Public Involvement Plan (PIP) process that has been established for MCP sites at MSH.

Additional remediation activities are necessary to address groundwater concentrations of tetrachloroethylene (PCE) above applicable Method 1 GW-2 in the SPD Area. The main remediation activities described in this RIP Modification are focused on a PCE source area that the Town of Medfield may redevelop.

The extent of SPD Area PCE concentrations have been assessed and remedial activities have been performed over multiple events including the following:

- Phase II Comprehensive Site Assessments (CSAs): June 2012;
- Phase III Remedial Action Plan (RAP): December 2013. In-Situ Chemical Oxidation (ISCO) was detailed as the selected Comprehensive Remedial Action (CRA);
- Phase IV RIP: December 2013; and
- Completion of three ISCO injection events: February 2014, May 2014, and November 2014/January 2015.

The ISCO events were initially successful at reducing groundwater PCE concentrations; however, PCE concentrations rebounded in several wells due to diffusion from a narrow up-gradient source area and also matrix diffusion (a process by which a chemical diffuses from the soil matrix back into the groundwater). A source area was identified in subsequent delineation activities in 2019 and 2020.

Following the ISCO events, eleven SPD Area Phase IV Status Reports have been submitted to MassDEP providing quarterly groundwater monitoring results. A supplemental delineation program was conducted in June 2019 and March 2020 that identified a localized source area at the south end of the former Laundry Building on the Medfield parcel. This highly localized impacted area is less than 60 feet wide from north to south. The associated PCE plume follows groundwater flow to the northwest. The PCE impacts are also generally limited to the saturated zone from approximately 8-10 feet below ground surface (bgs) to tight till at approximately 20-22 feet bgs.

To improve upon the ISCO treatment and provide a robust remediation of the source area, multiple remedial technologies will be implemented as described in this RIP Modification. DCAMM has chosen to implement a remedial alternative that greatly exceeds the minimum requirements to achieve MCP compliance. The remedial approach provides not only removal of the impacted source area but several additional remediation features to safeguard against future exceedance of the remedial action objective on land that may be redeveloped by the Town of Medfield. This RIP Modification provides a hybrid approach of source area removal and in situ treatment including:

- Limited surface clearing of vegetation;

- Installation of security fencing and erosion controls/environmental protection measures;
- Cut and capping of utilities within the treatment area;
- Excavation and stockpiling of non-impacted shallow soils,
- Excavation, dewatering and off-Site disposal of impacted source area soils via a truck route that was employed during the remediation of the former C&D Area. This route largely avoids residential neighborhoods and the downtown area of Medfield;
- Placement/compaction of a one-foot lift of higher-dosed zero valent iron (ZVI) at the bottom of the excavation following blending of ZVI at the tight till interface;
- Placement/compaction of ZVI-blended non-impacted shallow soils back in the excavation within the saturated zone;
- Placement/compaction of certified-clean backfill of similar gradation to prior unsaturated soil above the ZVI blended soil in the saturated zone;
- Construction of a permeable reactive barrier with ZVI along the downgradient (western edge) of the treatment area to prevent any potential back-diffusion of impacted downgradient groundwater into the treatment area;
- Support of excavation via sidewall sloping/trench boxes, dust/vapor monitoring/control, groundwater dewatering/treatment and infiltration will occur throughout the remediation;
- Site restoration to affected areas including any paved roadway, gravel surface area within the remedial area, and loam and seed of natural areas.

To assess proper dosing, a bench-scale study and evaluation of potential competing compounds was performed in 2019 and 2020. Monitored Natural Attenuation (MNA) will be implemented in areas with lower PCE concentrations and downgradient of the source area treatment. Additional detail regarding the RIP Modification are provided in the text below.

Groundwater monitoring will continue to occur in the existing groundwater monitoring network and post-remediation-installed monitoring wells to assess the effectiveness and longevity of this hybrid remedial approach. ZVI will persist for months to years, depending on groundwater contaminant levels, in the aquifer providing extended treatment time as compared to prior In-Situ Chemical Oxidation (ISCO) reagents.

1.0 INTRODUCTION

Weston & Sampson Engineers Inc. (Weston & Sampson), on behalf of the Division of Capital Asset Management and Maintenance (DCAMM), has prepared this Phase IV Remedy Implementation Plan (RIP) Modification in accordance with 310 CMR 40.0874 of the Massachusetts Contingency Plan (MCP) to address impacted groundwater within the Special Project Designation (SPD) Area of the former Medfield State Hospital (MSH). The purpose of the remedy is to address the groundwater contaminant of concern, tetrachloroethylene (PCE).

This Phase IV RIP Modification was prepared for Release Tracking Number (RTN) 2-3020799. The purpose of this modification is to describe changes to the Comprehensive Remedial Action (CRA) to remediate PCE in soil and groundwater at the Site. The original CRA was presented in the Phase IV RIP submitted to the Massachusetts Department of Environmental Protection (MassDEP) in December 2013.

1.1 Site Description and Location

The former MSH is located at 45 Hospital Road in Norfolk County, Medfield, Massachusetts (see Figure 1 - Locus Map). The property is situated in a rural area, and much of the surrounding area consists of undeveloped land and residential areas. The geographic coordinates of the property are:

UTM Coordinates:	4,675,892 meters North 307,236 meters West
Latitude/Longitude:	42°12'41" North 71°20'07" West

Please refer to Figure 2 for the Existing Conditions Site Plan.

1.2 Background

The former MSH facility was operated by the Department of Mental Health (DMH) as a psychiatric treatment facility from 1896 until 2003, when it ceased operations. The MSH was a self-sufficient facility that included residential facilities, agricultural fields, a dairy farm, machine and carpentry shops, a Laundry Building (now demolished), potable water well supply, and a construction and demolition (C&D) waste disposal area (C&D Area). The C&D Area has been remediated under a separate Phase IV RIP and has subsequently been redeveloped into the *Charles River Gateway at Medfield* public park. Please refer to the C&D Area Phase IV RIP Completion Report submitted to the MassDEP in April 2017 for details of the C&D Area remediation and the Activity and Use Limitation (AUL) filed with the MassDEP on October 19, 2020.

The MSH facility also included a coal-fired Power Plant built in 1903. The 1903-era Power Plant was demolished in 1930 and a new Power Plant was constructed near the Charles River. The Power Plant switched from coal to No. 6 fuel oil in approximately 1957. The Power Plant was demolished in 2008. The former Power Plant Area encompasses the area east of the former C&D Area and west of the access road to the former Power Plant (now the access road for the Charles River Gateway). The area east of the access road and west of the former Laundry Building Site is referred to as the SPD Area. The location of the former Power Plant and SPD Areas is shown on Figure 2.

The main contaminant of concern in groundwater found at the Charles River Gateway and SPD Areas is PCE. The PCE concentrations that were located in the former Power Plant Building area were remediated and the post-remediation groundwater sampling results were below applicable standards and presented in the June 2015 Phase IV RIP Status Report #2. No further groundwater treatment is required at the former Power Plant Area.

Weston & Sampson performed a Supplemental Delineation Program in June and September 2019 and completed in March 2020 that identified the source of PCE south of the former Laundry Building. While the source of PCE remains unknown, this delineation was information that was provided to the MassDEP in 2019 and 2020 SPD Area Phase IV RIP Status Reports 10 and 11. Please refer to these Phase IV Status Reports for detailed locations and findings of the supplemental delineation program.

1.3 Relevant Contacts

The following relevant project contacts include:

Responsible Party

The Massachusetts Division of Capital Asset Management and Maintenance
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1.4 Release History

Based on the 2019 and 2020 supplemental delineation, the release history is updated herein from the December 2013 Phase IV RIP. The delineation activities identified PCE impacts at the south extent of the former Laundry Building. The area of groundwater impacts that is subject to this Phase IV RIP Modification exists in the SPD Area to the south and west of the former Laundry Building with a dissolved PCE plume extending to the west towards the Charles River.

No history or knowledge of degreasing activities are known to have occurred at the former Laundry Building. The 2013 Phase IV RIP noted that waste solvents or degreasers were the 'presumed' source of PCE. No records or other information from DCAMM support this 'presumed' source and do not support PCE being tied to degreasing or spent solvents. The release history is updated to reflect that the potential source of PCE identified by supplemental delineation is unknown. Based on the lack of documentation or knowledge of virgin/spent solvent storage or degreasing at the former MSH and this specific project area, surplus soils are not considered as F-listed hazardous waste per the definitions under the Resource Conservation and Recovery Act (RCRA) and 40 CFR 40.261.31.

Historical Site reconnaissance indicated storage of empty containers within the south end of the former Laundry Building; however, no labelling or records were present or identified that indicated the potential prior contents. These drums were empty and removed from the Site as part of Laundry Building demolition activities. No source of the Site PCE is known. DCAMM has not identified records indicating that solvent degreasing or storage of virgin or spent solvents occurred at any time during the MSH history of operations.

1.5 Areas of Public Health and Sensitive Environmental Receptors

Wetlands resource areas associated with the Charles River are present at the C&D Area and westernmost extent of the SPD Area. There are approximately 18 acres of wetlands resources on the MSH property and the C&D Area remediation activities from 2014 to 2015 restored approximately 1.8 acres of wetlands. No wetland regulated resource areas are located within the core MSH campus or within the RIP Modification area of work. Additionally, Natural Heritage & Endangered Species Program (NHESP) does not list any sensitive habitat areas within the work area.

Protected open spaces are also mapped adjacent to the Site to the north and west. The MSH was considered an institution, as defined by the MCP to include hospitals, health care facilities, orphanages, nursing homes, convalescent homes, educational facilities, correctional facilities, or other such facilities that provide overnight housing, although it is currently inactive in that function. Please refer to Figure 1 for the locus plan of the project area, Figure 2 for a Site plan, and Figure 3 for a map of sensitive environmental receptors.

1.6 MCP Soil and Groundwater Classification

1.6.1 Soil

Considering both current and reasonably foreseeable future Site activities and uses, soil in the SPD Area is categorized as S-1, in accordance with the MCP, 310 CMR 40.0933(5). Generally, the unsaturated zone of the SPD Area does not contain PCE concentrations, which supports the Conceptual Site Model (CSM) that the release was localized and is migrating through the groundwater table. However, the soil is considered accessible because the SPD Area is largely unpaved, and impacts were detected in potentially accessible soils (less than 15 feet below ground surface). The S-1 category is the most restrictive standard that can be applied to a disposal site.

1.6.2 Groundwater

At a minimum, the MCP categorizes all groundwater in Massachusetts as GW-3 (310 CMR 40.0932). The GW-2 criteria, as defined in the MCP, 310 CMR 40.0932, do not currently apply to the SPD Area because, although groundwater is identified at the Site less than 15 feet below ground surface (ft. bgs), occupied structures are not present. However, potential future residential development is proposed for a portion of the SPD Area adjacent to the former Laundry Building area on a parcel of land the Town of Medfield may redevelop; therefore, groundwater concentrations in this area will be compared to the GW-2 standards. The GW-1 criteria as defined in the MCP, 310 CMR 40.0932 (4) applies to a portion of the SPD Area west of the Charles River Link trail because this area of the Site is located within a medium yield Potentially Productive Aquifer (PPA). MassGIS data was used to delineate the GW-1/GW-2 boundary. Please refer to Figure 3 for the MassGIS Area Receptor Map including the PPA. The PPA boundary is also depicted on Figures 4, 5, 6, 7, and 8.

In summary, groundwater concentrations were compared to: GW-1 cleanup standards for the portion of the SPD Area within the PPA boundary, GW-2 standards for general SPD Area wells installed in the vicinity of the former Laundry Building Area, and GW-3 standards for all assessment areas. Weston & Sampson will report the most stringent standard applicable for a given area for comparison with analytical data described in the text. Applicable standards for a given area are presented in analytical summary tables included with this Report and referenced in the text.

1.7 Public Involvement

DCAMM has actively engaged the public in the assessment and remediation activities at the former MSH since April 2003. Specific opportunities for public engagement and comment are provided for in the MCP and various wetlands permitting processes.

As provided for by the MCP, a Public Involvement Plan (PIP) identifies for community members the specific opportunities for public participation in cleanup decisions, when advance notice of Site activities will be provided, and when information about Site investigations will be available. The PIP identifies community concerns and describes activities that will be undertaken to address and incorporate public concerns in the remedial response process. Originally, a PIP was prepared and a PIP Group formed, for each release area at the former MSH. These Plans and Groups were combined in 2009 when a comprehensive approach to the assessment and remediation of the former MSH was undertaken.

As part of the PIP process, the public has the opportunity to review and comment on numerous documents prepared under the MCP. These documents are provided to Town officials including the Selectmen and the Board of Health, and copies are in the public repository located in the Medfield Public Library. This Draft Phase IV RIP is subject to a 20-day PIP group comment period. These comments will be documented and responded to in the final Phase IV RIP Modification to be submitted to the MassDEP.

In accordance with Minimum Public Involvement Activities in Response Actions in the MCP (310 CMR 40.1403), notice of the availability of the Final Phase IV RIP will be submitted to the Medfield Chief Municipal Officer and the Board of Health. In addition, a legal notice identifying the completion of the Phase IV RIP will be published within 7 days of submittal of the Final Phase IV RIP Modification. A copy of this document will also be placed in the public repository in the Medfield Public Library. Copies of the letters and notice are included in Appendix A.

2.0 CONCEPTUAL SITE MODEL

A CSM is used to describe the physical conditions associated with a site, the location of contaminants, and their potential movement in the environment. The CSM presented below specifically addresses the area of PCE-impacted groundwater within the SPD Area. At the end of the CSM section, we present how the prior CRA will be modified to account for the current conditions and supplemental delineation observed at the Site.

2.1 Physical Setting

The area of groundwater impacts that is subject to this Phase IV RIP Modification exists in the SPD Area to the south and west of the former Laundry Building with a dissolved PCE plume extending to the west towards the Charles River. Advancing west from the former Laundry Building, the terrain slopes steeply down gradient from approximately elevation 190 feet above mean sea level (amsl) to approximately 150 feet amsl. The ground surface in this area is vegetated mostly with scrub growth (e.g. weeds, thorns, vines, bushes) and sparse immature/mature tree growth. Advancing further west past the Charles River Link Trail, the terrain consists of a grassy slope and encompasses the Charles River Gateway created from the C&D Area remediation activities that were completed in 2014 and 2015.

2.2 Geology/Hydrogeology

The soil within the eastern portion of the SPD Area consists of glacial till which is comprised of fine sand and silt with trace fine gravel and trace clay. Veins of clay were noted in a number of borings in the SPD Area. In the area west of the Charles River Link Trail, coarse grained fill overlies alluvium material (e.g. fine to coarse sand). Groundwater is present within the glacial till layer in the eastern SPD Area and within both the fill and the alluvium in the area west of the Charles River Link Trail. Due to the larger grain size soils in the area west of the Charles River Link Trail, the groundwater velocity and aquifer transmissivity is higher than the eastern SPD Area. Groundwater velocity and aquifer transmissivity is comparatively lower in the eastern SPD area due to the tighter soil matrix. Please refer to Table 1 for a summary of groundwater elevation and gauging results through May 2020.

The 2019 and 2020 delineation found subsurface condition matching prior subsurface assessments. Soil borings were advanced via GeoProbe® direct-push drill rig identified refusal in dense till, at approximately 18 to 23 ft. bgs. Soils were generally brown to gray sand with some gravel. The saturated zone includes very dense sand/ tight tills. For the two deep boreholes (SB-E6D and SB-F6D) Weston & Sampson used telescoping drilling methods using hollow-stem auger and at refusal, roller bit drilling methods were used to advance through tight, dense till to a depth of 35 ft. bgs. Weathered rock was encountered at approximately 20.5 ft. bgs.

Bedrock in the area primarily consists of the Mattapan Volcanic Complex, a felsic granite. Outcrops are not visible at the Site, and borings indicate increasing depth to refusal from east to west towards the Charles River. As seen in many of the soil borings, boulders, cobbles and glacial till overlie the bedrock. Please refer to Appendix B for SPD Area soil boring logs.

2.3 Analytical Results

Significant subsurface assessment has been performed in the SPD Area. These results found that PCE is strongly sorbed to the tight soil matrix (glacial till), and that PCE impacts primarily occur in the dissolved phase (i.e., in groundwater). Since the PCE source is unknown and historical in nature and primarily dissolved in groundwater, the graphical trends for PCE concentrations in groundwater appear

to indicate that soil matrix storage and release (matrix diffusion) processes are taking place in the aquifer, as provided in Appendix A. Matrix diffusion is further discussed in Section 2.5. The estimate of the age/source of the release has been presumed to be prior to 1970 in part based on the lack of records or knowledge of the use of PCE at the SPD Area and former MSH.

Weston & Sampson performed a 2019 and 2020 supplemental delineation program to refine remedial areas for this Phase IV RIP Modification. A summary and the results of this delineation program are provided below.

Supplemental Delineation Program Summary

In June and September 2019 and March 2020, Weston & Sampson conducted a supplemental delineation program to collect additional horizontal and vertical delineation data. While previously described in detail in Phase IV Status Reports #10 and #11, this section summarizes the results that directly informed the remedial design.

In June 2019, Weston & Sampson advanced 17 soil borings on a 30-foot by 30-foot grid. Soil borings were advanced to approximately 18-23 ft. bgs. To assess groundwater conditions, ten soil borings were completed as temporary monitoring wells. Monitoring wells were also located in impacted areas based on field screening and analytical results obtained during the delineation program. Groundwater samples were collected from these temporary and permanent monitoring wells to assess groundwater conditions. In September 2019, Weston & Sampson advanced additional soil borings to further delineate the eastern extents of PCE. Please refer to the attached Figure 6 for a graphical depiction of the grid sample locations and Appendix B for the soil boring logs.

In March 2020, Weston & Sampson advanced an additional five soil borings to approximately 15.5 to 30 ft. bgs. Four of these soil borings were completed as temporary monitoring wells. To assess vertical extents of PCE, deep monitoring wells E6D and F6D were installed during the March 2020 field assessment. Please refer to the attached Figure 4 for a graphical depiction of the grid sample locations and Appendix B for soil boring logs. The following subsection details the results of the supplemental delineation program.

Data Collected from Delineation Program

During the supplemental delineation in 2019 and 2020, Weston & Sampson collected field and analytical data. This data included the following:

- Total Volatile Organic Compounds (VOCs) field screening results from a photo-ionization detector (PID) with parts per billion by volume (ppbv) sensitivity from a 10.6 eV lamp;
- Soil samples for VOC analysis via EPA Method 8260 at a state-certified laboratory; and
- Groundwater samples for VOC analysis via EPA Method 8260.

Analytical data generated from this assessment utilized the prescribed methods from the MassDEP Compendium of Analytical Methods which are required to achieve presumptive certainty for response actions at MCP sites. Please refer to Tables 2 and 3 for a summary of the groundwater and soil analytical results, respectively, and Appendix B for the soil boring logs. The Phase IV Status Report #11 submitted to the MassDEP on July 31, 2020 includes the associated laboratory analytical reports.

Field screening results showed the highest total VOC readings at locations corresponding to elevated groundwater sampling results (south of the former Laundry Building). The readings showed the 10 to 20-foot interval exhibited the highest PID readings in the parts per million by volume (ppmv) range. The highest PID reading was at soil boring SB-F6 from 10 to 15 ft. bgs with a reading of 42 ppmv. Soils in the overlying 0 to 10-foot interval and underlying 20 to 30-foot interval exhibited significantly lower PID readings. These findings show that PCE impacts are limited to soil in the saturated zone and do not exist in the overlying vadose and unsaturated zones. Please refer to the boring logs for PID screening results provided in Appendix B.

Soil data further supported and refined the delineation and understanding of the CSM. Soil laboratory results identified a highest PCE concentration of 5.1 milligrams per kilogram (mg/Kg) from soil boring location SB-G6 at a depth of 10 to 15 ft. bgs. PCE was the sole VOC analyte detected in soil samples and concentrations are below the current MCP Method 1 S-1/GW-2 cleanup standard of 10 mg/Kg. The collected soil data and groundwater data supported the vertical delineation of VOCs.

In addition to VOC analysis, to review the potential for Zero Valent Iron (ZVI) (as described in Section 2.4) interference and passivation, Weston & Sampson collected soil samples for total and dissolved silica, total phosphorous, and manganese. The concentrations of these analytes do not change the proposed ZVI dosing. Please refer to Table 3 for a summary of soil analytical results and Table 4 for a summary of these additional soil parameters.

Delineation Program Results

The delineation program identified a narrow area of elevated PCE concentrations in groundwater along the south end of the former Laundry Building. The PCE concentrations in groundwater in this area ranged up to 13,000 micrograms per liter (μg/L) at monitoring well F6; this result exceeds the previous highest PCE concentration of 1,700 μg/L identified at monitoring well SPD-MW-401S detected on June 15, 2015. Groundwater PCE isocontours from the May 2020 sampling event and average PCE concentrations over time are presented in Figure 4 and Figure 5, respectively, and provided in Table 2.

The area of elevated PCE concentrations is less than 60 feet wide from the north to south. These concentrations extend from east to west following the general groundwater flow direction from monitoring well G6 to the west towards SPD-MW-401S. This localized area is located to the south of the former Laundry Building. Figures 7 and 8 depict the groundwater contours and flow direction from the source area and down-gradient.

Analytical results from deep aquifer monitoring wells indicated that vertical migration does not appear to be a significant migration pathway since PCE concentrations are observed at significantly lower concentrations in the deeper aquifer. Presumably, vertical migration is halted by the tight soil matrix in the till observed at deeper depths. Please refer to Table 2 and 3 for groundwater and soil data including from deep monitoring wells E6D and F6D.

2.4 Bench-Scale Study

The SPD Area includes PCE impacts at relatively shallow depths. Based on the accessible depths, remedial alternatives including source area removal and direct reagent application via soil blending reagents were further evaluated. To improve the long-term effectiveness of the remedial design, a longer lasting reagent, Zero Valent Iron (ZVI), was selected for bench-scale study. ZVI is powdered or granular iron in a powder or filing form that when applied within the groundwater table destroys PCE and other

contaminants via chemical reduction. Hence, this RIP Modification describes the evaluations which occurred to change the selected remedy from ISCO to In-situ chemical reduction via ZVI.

During the supplemental delineation in 2019 and 2020, Site soil and groundwater was collected for bench-scale study by XDD Environmental, LLC., the bench-scale study consultant. The 2019 and 2020 bench-scale study results identified ZVI as effectively treating PCE in the saturated zone and capable of achieving MCP remedial objectives, Method 1 GW-2 standards. Based on the source removal, ZVI treated backfill and PRB wall, the CRA treatment is likely to achieve Method 1 GW-1 standards in the treatment area. As noted in Section 1.6.2., Method 1 GW-1 standards do not apply to the treatment area.

The dosing rates developed from the bench-scale studies assumed treatment of source area PCE and that the treated PCE mass would remain on-Site. As the CRA will include source area removal in combination with backfill with ZVI treated soil , a dosing rate reflective of the lack of source-area PCE will be used as additional treatment/factor of safety towards a successful source area remediation as described in Section 3.0.

ZVI has the potential for interference via competing compounds in the subsurface. As listed in Section 2.3, soil samples for dissolved silica, total silica, total phosphorous, and manganese were collected and analyzed to evaluate if these constituents would compete against the tested soil blending reagent, ZVI (Table 4). The results, reviewed with the bench-scale study consultant, do not indicate the aforementioned constituents would affect the soil blending reagent. Please refer to Appendix C for the bench-scale study reports.

2.5 Fate and Transport

Since the PCE is dissolved in groundwater, there are many fate and transport processes that require evaluation to understand the movement and ultimate fate of PCE in the aquifer. These processes include:

- Dilution – the process by which higher concentrations of a chemical are lowered by introducing higher volumes of clean water.
- Dispersion – the mixing of flowing groundwater.
- Degradation – the transformation by several methods (e.g. biological, chemical, or by light) of a compound to another compound resulting in lower concentrations of the original compound.
- Discharge – the discharge of a chemical into another matrix/location.
- Sorption – the removal of a dissolved chemical by association with a solid (e.g. soil).
- Matrix diffusion – the movement of chemical molecules sorbed to a porous matrix (e.g., soil) to groundwater under the influence of a concentration gradient.
- Oxidation – the process by which a chemical loses electrons or gains oxygen.
- Reduction – the process by which a chemical gains electrons or loses oxygen.

As noted in the Phase IV RIP and aside from direct treatment via ISCO, the processes of dilution and dispersion have been the primary mechanisms for which PCE concentrations have been decreasing in the aquifer at the Site. Since large volumes of clean water associated with the regional flow of groundwater in the Charles River basin are introduced into the aquifer, dilution of the dissolved PCE is occurring. This can be seen by the non-detect and very low concentrations of PCE present in the C&D Area, which is adjacent to the River and downgradient of the Charles River Link Trail. With respect to dispersion, the higher groundwater velocity associated with the steep hydraulic gradient from the

eastern SPD Area towards the Charles River has dispersed and continues to disperse the PCE plume over a larger area.

Natural degradation has not been a significant process in the SPD aquifer based on the aquifer geochemistry and the lack of chemicals typically associated with degradation of PCE. These chemicals are called "daughter products" which result from anaerobic degradation of PCE and include trichloroethylene (TCE), dichloroethylene (DCE), and vinyl chloride (VC). Limited daughter products are present in the down-gradient, western portions of the PCE plume. The geochemistry of this down-gradient plume area has a lower dissolved oxygen (DO) and Oxidation Reduction Potential (ORP) that are more conducive to PCE degradation than the up-gradient source eastern plume areas. Please refer to Table 2 for a listing of these results including C&D Area monitoring well locations.

The prior CRA of ISCO injection events included injection events in February 2014, May 2014, and January 2015. Groundwater monitoring events performed since the ISCO injections indicates a rebound of PCE concentration and prompted DCAMM and Weston & Sampson to evaluate alternative remedial technologies.

Weston & Sampson has theorized that contaminant rebound is due to diffusion of PCE from the narrow width south area of the former Laundry Building with elevated PCE impacts and matrix diffusion and. As described in Section 2.3, the source area to the south of the Former Laundry Building is the primary source of residual PCE and the associated PCE plume in groundwater. The diffusion from this area of high PCE concentrations will be eliminated based on the CRA.

Matrix diffusion also negatively impacted prior remedial efforts. ISCO reagents degrade contaminants present in the aqueous phase but do not entirely degrade contaminants sorbed to soil. Once the reagent is depleted, any remaining sorbed contaminant can re-equilibrate with groundwater under the concentration gradient established by the destruction of aqueous phase contaminant, resulting in an increase in contaminant concentration. This mechanism can occur when contaminant molecules diffusing from low permeability media that were not completely treated during ISCO injections (due to lack of direct contact between ISCO reagents and sorbed particles) dissolve into groundwater.

Low permeability media is present in the SPD area as tight glacial till components (including silt and clay veins), therefore, matrix diffusion is possible. The matrix diffusion effect is exacerbated by seasonal fluctuations in the water table at the Site that cycles groundwater through PCE-impacted media. To avoid matrix diffusion the CRA calls for removal of source area soils and direct soil blending of ZVI reagents as further detailed in the following section.

2.6 RIP Modification Design Considerations

To further treat PCE impacts to the SPD Area, this Phase IV RIP includes modification of the prior ISCO CRA to a hybrid approach of off-Site disposal of source area soil, backfill with ZVI treated Site soil, and the installation of a ZVI Permeable Barrier Wall (PRB). The rationales for these design changes include:

- Removal of source area soil – eliminating potential for continued groundwater diffusion of PCE;
- Providing long-lasting reagents through the placement of ZVI in saturated zone backfill and down-gradient edge as a PRB wall to treat potential low concentrations of residual PCEs; and
- Isolating the treatment area and area of potential redevelopment from back-diffusion of PCE from the plume area immediately to the west.

Overall, these changes provide a permanency via the off-Site removal of source area soil and on-Site destruction of PCE-impacted groundwater in the treatment area. Please refer to Section 3.4 for details of the modification to the CRA.

3.0 PHASE IV RIP MODIFICATION

This Phase IV RIP Modification has been prepared in general accordance with the requirements of 310 CMR 40.0874 of the MCP to develop modifications and procedures of the selected CRA for the Site. The Phase IV RIP Modification presents the planned remedial activities to address the PCE-impacted groundwater at the Site. The selected remedial approach for PCE-impacted groundwater is a hybrid approach of off-Site transport and disposal of source area soil, blending of soil backfilled within the excavation area with ZVI and placement of a ZVI PRB wall. The remediation will focus on a treatment area that includes the source area and areas extending on the Town of Medfield parcel.

As the impacted source area will be removed from the Site, the down-gradient concentrations in SPD area groundwater are anticipated to decrease as non-impacted groundwater and groundwater that encounters ZVI within the backfill area and PRB wall migrate down-gradient. The western portions of the plume area will be assessed through monitored natural attenuation (MNA). Please refer to Figure 9 for a graphical depiction of the source area removal areas. Additional remedy implementation details associated with this approach are presented below and on the plans included in Appendix D; please note the drawings are not bid or construction documents and are subject to change.

Non-impacted soils in the unsaturated zone will be excavated, stockpiled, and blended with ZVI on-Site. Saturated zone soils will be excavated, dewatered and transported off-Site for disposal and replaced with the ZVI blended unsaturated zone soils as depicted on Figure 6. Down-gradient conditions will be monitored before, during and after remediation.

3.1 Response Action Objectives

The goal of the remedial action is to lower the concentration of VOCs and specifically PCE in SPD Area groundwater. The remedial objective is to achieve concentrations of PCE below the future Method 1 GW-2 standards on the parcel conveyed to the Town of Medfield. The MCP GW-2 standard for PCE is 50 μg/L. For the westernmost plume extent, the remedial objective is the applicable Method 1 GW standard for PCE of 5 μg/L. Groundwater monitoring post-remediation will be performed to assess achievement of remedial action objectives.

When the groundwater concentrations decrease below the applicable Method 1 GW-1 or GW-2 standards over four (4) seasonal groundwater monitoring events, the appropriate regulatory closure documentation will be prepared and submitted to the MassDEP. A Permanent Solution Statement is the anticipated future MCP filing when remedial objectives are achieved.

3.2 Significant Changes in Site Conditions or New Site Information

As described in Section 2.0, Weston & Sampson performed supplementation delineation program of the south and east extents of SPD Area in 2019 and 2020. The results of this program are provided in Phase IV RIP Status Reports #10 and #11 and are summarized in Section 2.3 of this report. Please refer to Tables 2 and 3, and Figures 5 and 6 for details of the delineation data. As noted in Section 2.4, bench-scale studies were performed to evaluate ZVI. Please refer to Appendix C for the bench-scale study reporting.

3.3 Modifications to the Conceptual Remedial Plan

To achieve remedial objectives, the CRA is being modified to include removal of source area impacted soil, treatment of residual and downgradient PCE impacted groundwater via ZVI treatment through soil

blending of backfilled materials as well as installing a PRB wall. The CRA of MNA remains in place to the west of the PRB. Section 3.4 details the source area treatment and Section 3.5 describes the MNA for the west area.

3.4 Source Area Treatment

For the Source Area treatment to the south of the former Laundry Building, the CRA will be a hybrid remedial approach. The major remedial elements of this hybrid approach are:

1) Source area soil excavation and off-Site transport and disposal; and
2) Treatment of groundwater via two methods:
    a. ZVI application of soils backfilled in saturated zone;
    b. ZVI PRB wall at down-gradient end of remedial area.

To construct this remedial approach, the following tasks are anticipated and detailed in the subsections 3.4.1 through 3.4.5:

Site Preparation:

a) Environmental Protection
b) Clearing of vegetation within treatment area
c) Monitoring Well Decommissioning
d) Construction Fencing, Dust Controls and Air Monitoring
e) Utility Abandonment

Excavation, Treatment and Stockpiling of Unsaturated Zone Soil:

f) Excavation of unsaturated zone soil from the ground surface to 8 to 10 ft. bgs and on-Site stockpiling;
g) Blending of ZVI with stockpiled unsaturated zone soil; this blended soil will be used as backfill for the excavated saturated zone soil as described below;

Saturated Zone Soil Excavation, Transportation and Disposal & Dewatering:

h) Excavation of cells of the saturated zone PCE-impacted soil – the excavation extents will range from the historic high groundwater table elevation to 18 to 22 ft. bgs;
i) Soil disposal characterization - based on existing soil data transport and disposal will be to an in-state landfill. As noted in Section 1.4 the soil does not meet the criteria as a listed hazardous waste (F-listed) because there is no documentation or knowledge of virgin/spent solvent storage or degreasing at the former MSH and specifically this area;
j) Dewatering as needed including on-Site storage, activated carbon treatment and recharge on-Site in accordance with the MCP;

Site Restoration:

k) Treatment of the tight-till interface at the bottom of excavation with ZVI soil blending if feasible (e.g. blending does not result in unsafe conditions related to high-velocity mixing of the till interface) or placement of a one-foot lift of soil blended with a higher dosing of ZVI at the bottom of the excavation to prevent matrix diffusion from the till interface;
l) Backfill of the saturated zone and compaction with ZVI-treated unsaturated zone soils;
m) Repeating steps above for each cell within treatment zone;
n) Placement and compaction of imported clean fill in unsaturated zone;

o) Surface restoration to prior gravel parking, asphalt driveway, and/or loam and seed of unpaved earthen areas; and
p) Installation of replacement monitoring wells within and around the treatment zone as shown on Figure 10. These wells will be screened in the saturated zone above the till interface.

PRB Wall:

q) Construction of a PRB wall comprised of a high dose of granular ZVI at west extent of excavation;

Please refer to Figures 9 and 10 for a graphical depiction of the soil removal area, treatment area and location of PRB wall. Please refer to Appendix D for construction drawings.

As compared with fully *in situ* treatment technologies such as ISCO injections or soil blending alone, the hybrid approach described above eliminates the source area and provides a ZVI mass to treat residuals that may be present beyond the excavation extents. The ZVI PRB wall will provide additional treatment to residual PCE that may be mobilized and transported by groundwater flow and prevent any diffusion of PCE to the area planned for redevelopment by the Town of Medfield. However, since groundwater flow direction and velocity is to the west toward the Charles River, it is unlikely that groundwater will flow against the gradient to the east. Additional Source Area treatment activities are detailed in the subsections below.

3.4.1 Site Preparation

Environmental Protection

Prior to subsurface disturbance, environmental protection and erosion control measures will be installed. Environmental protection and erosion control measures to be employed during the Phase IV RIP Modification will include the following:

- Straw bales and silt fence will be installed along the down-gradient perimeter of the work area to minimize the transport of soil via overland erosion. Straw bales and silt fence will be maintained or replaced as necessary to protect the surrounding area consistent with previous remedial actions at the Site.
- Temporary chain-link and/or snow fencing will be erected around the perimeter of the work area to restrict trespassing into the work area during non-work hours.

Clearing and grubbing will be performed in the work and stockpile area to allow for excavation and soil blending to proceed. Removed trees will be chipped and applied in adjacent unpaved/wooded areas of the Site as mulch.

Monitoring Well Decommissioning

Monitoring wells within the excavation and soil blending area will be over-excavated and removed. Deep monitoring well locations E6D, and F6D extend to 35 ft. bgs, and beyond the excavation/soil blending zone. As such, these monitoring wells will be properly decommissioned prior to soil excavation and blending in general conformance with the MassDEP Standard Reference Manual for decommissioning of monitoring wells. The decommissioning will include plugging with neat cement from the bottom of the borehole. The plugging will terminate approximately four ft. bgs with a one-foot thick concrete plug atop the grout. The surface three feet of the former well will be backfilled with materials compatible with the surrounding land surface.

Construction Fencing & Dust Controls

Based on the proximity to walking trails and passive recreation areas, access restriction will be implemented during the construction period. While ZVI is a non-hazardous material, ZVI will be stored within the temporary construction fencing. The construction fencing will include a dust screen to limit wind erosion/migration of soils during excavation. Additional dust controls will be implemented include application of water to excavation areas to reduce dust generation. Stockpiles of saturated zone source area soil will also be covered with polyethylene sheeting to further minimize dust. Stockpiles will be secured within the limits of temporary construction fencing and covered securely with stakes/weighted with objects to prevent windblown removal of the covers. Additional detail is provided in the dust-monitoring plan presented below in section 3.4.9 of this report.

Utility Abandonment

Utilities within the remedial area will require proper abandonment. The remedial contractor will cut and cap the water, stormwater, and gas lines. The remedial contractor will coordinate with DCAMM, Town of Medfield, and utility companies prior to abandonment of project-area water, stormwater, and gas utility lines. Please refer to Appendix D for the approximate utility cut and cap locations.

3.4.2 Excavation, Treatment and Stockpiling of Unsaturated Zone Soil

The non-impacted unsaturated zone soils will be excavated, stockpiled, and blended on-Site using rotary or pug mill blending methods. These soils have been above the seasonal high groundwater table and are not impacted by PCE. For safety and to maintain excavation sidewall stability, the excavation sidewall slopes will be 1.5:1. The selected remedial contractor will be required to obtain an excavation/trench permit from DCAMM in accordance with 520 CMR 14.00.

Approximately 3,500 CY of non-impacted soil is anticipated to be excavated, stockpiled on-Site, a portion amended with ZVI, and used as backfill in the saturated zone. The Contractor will develop three stockpiles including the following approximate volumes:

1. 2,000 CY of 3% dosed ZVI-treated soil for backfill into saturated zone;
2. 500 CY of 5% dosed ZVI-treated soil for backfill of bottom foot of excavation areas closest to till interface; and
3. 1,000 CY of surplus backfill that will be placed above the saturated zone.

These soil stockpiles will be bermed and managed with erosion controls. If these controls are not sufficient these stockpiles will be further secured with polyethylene sheeting.

The soil removal and blending zone is provided on Figure 9. Excavation and soil blending depths determined using the results of 2019 and 2020 supplemental delineation as described in Section 2.3. In general, excavation depths of unsaturated soils will be to 8 to 10 ft. bgs.

3.4.3 Saturated Zone Soil Excavation, Transportation and Disposal & Dewatering

After the segregation and temporary removal of non-impacted unsaturated zone soils, excavation cells will be used to remove up to approximately 2,000 to 2,500 tons of PCE-impacted soil from the saturated zone. The removal area is approximately 5,500 square foot and will be excavated from the water table to the till interface, approximately 20 to 22 ft. bgs. The saturated zone soils will be excavated, live-loaded or temporarily stockpiled, transported, and disposed of at a licensed disposal facility. Stockpiled soil will

be placed on and covered by polyethylene sheeting. Based on soil analytical data, it is anticipated that in-state landfill disposal will be performed.

The excavation of soils at depths of up to 22 ft. bgs will require support of excavation for safety and constructability. The treatment cells are assumed to be advanced via the largest available trench box. These trench boxes of approximately 10 ft. by 20 ft. in area are commonly used in earthwork projects and a readily available proven support of excavation technology. The remedial contractor will have the opportunity to propose alternate support of excavation technologies for DCAMM and Weston & Sampson review.

Disposal characterization will be performed in advance of soil disposal. This data will support the use of either a Material Shipping Record (MSR) or Bill of Lading (BOL) as disposal documentation. Weight slips will be provided to the MassDEP in subsequent Phase IV Status/Completion Reports.

3.4.4 Site Restoration

Backfill of Saturated and Unsaturated Zones

The excavated saturated zone soils will be replaced with treated non-impacted soils from the unsaturated zone. Clean imported material will be used as backfill of the unsaturated zone to grade. At the completion of backfill and compactions, the Site surface will be restored with gravel and/or asphalt to match existing conditions. In areas of tree removal, as future redevelopment may damage/destroy plantings, restoration is planned to be with surface gravel. Backfilled soil will be compacted in lifts to achieve a stable area.

Post-Remediation Monitoring Well Installation

Post-remediation, replacement/new monitoring wells will be installed to assess groundwater conditions within and down-gradient of the soil blending area. The new monitoring well will be placed at cross-gradient and down-gradient locations from the treatment areas to monitor subsurface conditions. The monitoring wells and evaluation of PCE will provide data over time of the longevity of the ZVI within the groundwater table. Please refer to Figure 10 for proposed location of these new monitoring wells subject to change based on field conditions.

3.4.5 PRB Wall

The west treatment area will be completed with a PRB wall of ZVI. This wall is estimated to be 80 feet long and three feet wide and generally perpendicular to the groundwater flow direction. Vertically, the PRB wall will extend from the seasonal high groundwater elevation to the till interface. The PRB will include imported sand and a dose of 20 to 30% long-lasting granular ZVI. The PRB wall will be more permeable than surrounding soils to ensure that groundwater flows across the PRB wall for treatment; the use of sand will limit groundwater mounding and flow around the PRB wall. The wall will be constructed using a trench box for excavation support and compacted to limit settling.

3.4.6 Impact to Environmental Receptors and Natural Resource Areas

The soil removal and blending activities are being conducted in areas away from sensitive receptors (e.g. wetland areas, endangered species habitats, or other sensitive environmental areas) as shown on Figure 3 – Area Receptors Map. The remedial objective is to reduce PCE concentrations below the GW-2 standards and thereby eliminate potential vapor intrusion associated with future development. The placement of ZVI both at the PRB and within the backfilled area will provide a long-lasting reagent to treat potential residual PCE.

3.4.7 Measure to Protect Environmental Receptors and Natural Resource Area

Implementation of the Phase IV RIP CRA is expected to have no adverse impacts on environmental receptors and/or natural resource areas with the use of environmental protection measures, monitoring of these measures, and proper work practices. To ensure there are no deleterious impacts on the environment as a result of this Phase IV, measures have been incorporated into the design, construction and operation of the Phase IV. These measures will be implemented by the remedial contractor, with observation by DCAMM and Weston & Sampson, and include engineering controls for the protection of human health and the surrounding and downstream river environment, such as air monitoring/dust control (see Section 3.4.9), storm water runoff management, and erosion controls during excavation activities.

Spill containment around containers and potential conveyance piping/hosing will be implemented on-Site. The remedial contractor will prepare an emergency response plan for potential spills or release of chemicals. In addition, the remedial contractor will contract with an emergency response contractor to respond to potential spills.

Potential spill and accidental discharge risks associated with implementation of soil excavation and remedial actions are primarily mechanical/physical failures of excavation and trucking equipment and/or fueling incidents. Standard operating procedures to ensure that the implementation of the remedy does not result in spills or accidental releases will include daily checking of hydraulic lines and reservoirs, and general observation of equipment which contain fuel, oils and lubricants. Absorbent materials and containers will be kept on Site during remedy implementation to contain incidental spills and/or accidental discharges from excavation and trucking equipment.

3.4.8 Observation and Monitoring Procedures During Construction of the Remedy

A resident engineer will be on-Site to conduct observation and monitoring activities during remediation. In addition, the contractor will provide inspection and verification of the proper dosing of ZVI.

The Modified RIP includes removal of source area soil and application of long-lasting ZVI. Based on these remedial changes, groundwater monitoring will include periodic evaluation of groundwater parameters such as pH, conductivity, ORP, and DO. Temporary monitoring wells will be installed within treatment cells and sampled for VOCs during construction. This data will be used to confirm the source removal and ZVI dosing are removing and/or destroying PCE. These groundwater samples will be collected for VOC analysis by EPA method 8260.

3.4.9 Health and Safety Plan and Air/Dust Monitoring

A Site-specific Health and Safety Plan (HASP) will be prepared by the Contractor for Site activities associated with the implementation of the selected remedial actions in accordance with the MCP 310 CMR 40.0018 and 40.0874(3)(e), and OSHA (29 CFR 1910.120). The Contractor will be required to have an Industrial Hygienist develop the HASP and include air monitoring for VOC vapors and dust. Copies of the applicable Safety Data Sheets (SDS) for reagents will be included in the HASP specification.

Ambient air inside and outside the work area will be continuously monitored for potential dust and vapors during the course of the work using real-time reading instruments. The excavation and off-Site transport and disposal of source area soils present a potential for PCE vapors. The Contractor will monitor using a ppbv-rated PID perimeter conditions of the excavation. Dust and vapor suppression/control measures,

including, but not limited to, wet misting excavation and covering stockpiled soil, will be used as necessary to maintain dust/vapor levels below the project action level identified in the following table.

Location/Sample	Parameters	Frequency	Action Levels
Perimeter Air: One upwind, three downwind stations	Real-time dust PCE (as measured by TVOCs)	**Dust:** Continuous logging of readings from each perimeter station **TVOCs:** Measured at monitoring locations at the start and end of each workday and at least four-times throughout the work day.	**Dust:** PM-10 (120 $\mu g/m^3$) **PID Readings*:** 25 ppm – Short Term (identified for less than 1 minute within the breathing zone) 50 ppmv for 8-hour time-weighted average (TWA)

Notes:
$\mu g/m^3$ = micrograms per cubic meter.
* Weston & Sampson adopted a TVOC action level using OSHA's Short-Term Exposure Limit (STEL) and conservatively half of OSHA's PCE permissible exposure limit (PEL) of 100 ppmv by TWA. In addition. Note OSHA provides a maximum exposure level (ceiling) of 200 ppmv for any three-hour period and these values provide a factor of safety below these limits.

The Contractor may provide for additional or reduced worker zone/worker dust/vapor monitoring action levels. If action levels are exceeded, the Contactor will stop work and deploy dust/vapor mitigation measures until such time that the monitoring data are below actions levels, at which time work may resume. Within 24-hours of exceedance of an action level, DCAMM and the PIP group will be notified.

3.5 Monitored Natural Attenuation

For areas outside the soil blending treatment zone and in the western plume area, MNA will be pursued. MNA allows for natural subsurface processes (biodegradation, volatilization, dilution, adsorption, chemical reactions, etc.) to degrade contaminants under either oxidized or reduced conditions. MNA is appropriate for the residual PCE outside the source area. Impacted source area soil removal and placement of ZVI both in backfilled soil and as a PRB wall, will decrease down-gradient PCE concentrations. The CRA will eliminate the highest concentrations of PCE in soil and groundwater in the source area to eliminate continued western migration of PCE.

3.6 Post-Remedial Monitoring

Post-remediation, the existing monitoring well network and newly installed wells will continue to be monitored on a seasonal basis as reported to the MassDEP in SPD Area Phase IV Status Reports. Laboratory analytical results of the seasonal groundwater monitoring will be provided within the applicable status reports and compared to the applicable MCP groundwater cleanup standards for the Site (GW-1 or GW-2 based on location). The report will identify contaminant trends, concerns, and/or corrective measure to be implemented, if applicable. The groundwater data will also be evaluated to evaluate if regulatory Site closure is appropriate.

3.7 Permits

The selected remedial contractor will be required to obtain an excavation/trench permit from DCAMM in accordance with 520 CMR 14.00. As the treatment area is outside of wetlands, wetland buffer zones, or other sensitive environmental areas, no other permits are anticipated for this project. All work will comply with existing DCAMM Site permits including but not limited to the MassDEP SPD Permit and where

applicable, the Town of Medfield Conservation Commission Order of Conditions for the downgradient C&D Area.

3.8 Property Access

The subject site is accessible to workers and equipment for this project. The western portion of the SPD Area is owned by DCAMM. After the transfer of state-owned land to the Town of Medfield, areas of the eastern portion of the SPD Area are now owned by the Town of Medfield. DCAMM is the party conducting the response actions. The Town of Medfield has granted access to DCAMM to complete remedial actions and monitoring. Please refer to Figure 2 for a graphical depiction of the property line location.

3.9 Construction Plans, Specifications and Schedule

This Section provides a description of the remedial construction plans and specifications and the anticipated schedule for completing the proposed Phase IV remedial activities outlined in this report. Copies of the pertinent plans and specification sections that are relevant to the design and implementation of the Phase IV RIP are provided in Appendix B.

The anticipated duration for remedial construction is three months. A tentative schedule is shown below. To avoid frozen ground and winter conditions, the work is planned to begin in the Spring of 2020 as estimated below:

Project Schedule	
Activity	Date
Submittal to PIP	1/22/2021
PIP Presentation	2/17/2021
PIP Comments	3/9/2021
Incorporation of PIP comments and DEP Submission	3/31/2021
Site Preparation, Surface Soil Stockpiling	May/June 2021
Off-Site Transport and Disposal of Saturated Zone Soil, Backfill with ZVI-Treated Soil	June/July 2021
PRB Wall Construction, Site Restoration	July/August 2021
Monitoring & MNA	May 2021 forward

3.10 Public Notification

A copy of the public notification letters to the Medfield Town Administrator and Board of Health are provided in Appendix E.

3.11 Operation, Maintenance and Monitoring Plan

The proposed response actions do not include the construction of an active remediation system. Therefore, general operating procedures are not required for this plan. During construction, general operations of the remedial contractor will be monitored during implementation of this Phase IV as described in Section 3.4.8. Emergency and contingency procedures during construction are provided in the Section 3.3. Post-remedial monitoring will follow the existing extensive program of quarterly rounds of groundwater sampling and continued reporting to the MassDEP and PIP group. Unlike the ISCO

injections which introduce reactive aqueous phase reagents and included associated reagent-specific monitoring, the source removal and introduction of ZVI does not change the on-going monitoring. Monitoring for VOCs will provide information on the subsurface conditions post-remediation.

The monitoring well network will be expanded to include new locations as described in Section 3.5.4. The contact information for the groundwater monitoring of the SPD Area is:

The Massachusetts Division of Capital Asset Management and Maintenance
Contact: Ms. Susan Ruch, Director of Environmental Services
One Ashburton Place, 15th Floor
Boston, Massachusetts 02108
(617) 875-0243

4.0 PHASE IV REMEDY IMPLEMENTATION PLAN REQUIREMENTS

The MCP requirements for a Phase IV RIP (310 CMR 40.0874) are presented below in ***bold italicized*** text along with the responses in plain text.

a) a list of relevant contacts, including:

The relevant contacts are provided in Section 1.3 of this report.

b) Engineering Design. The RIP shall document engineering concepts and design criteria to be used for the design and construction of the Comprehensive Remedial Action including as appropriate and without limitation:

The engineering design for the SPD Area is provided in Sections 3.3 through 3.5 of this report.

c) Construction Plans and Specifications. Construction plans shall be prepared in conformance with appropriate engineering and construction standards and practices, and regulations applicable to construction plans and activities. Information on the proposed plans for the construction of the selected remedial action alternative shall be provided in the RIP and include, without limitation, the following:

Construction Plans and Specifications are outlined in Section 3.9 and Appendix B of this report.

d) Operation, Maintenance and/or Monitoring (OMM). In cases where the Comprehensive Remedial Action for the disposal site requires operation, maintenance and/or monitoring activities to ensure the effective performance and integrity of the Comprehensive Remedial Action and/or the achievement of remedial goals, an Operation, Maintenance and/or Monitoring plan shall be developed and included in the RIP. The OMM plan shall include measures necessary to assure effective operations of the Comprehensive Remedial Action under both normal and emergency conditions. The OMM plan shall include, as appropriate and without limitation, the following:

A discussion of the operation, maintenance, and/or monitoring (OMM) plan is provided in Section 3.11 of this report.

e) a health and safety plan, to be followed during the construction and implementation of the Comprehensive Remedial Action, that adheres to the procedures described in 310 CMR 40.0018;

A discussion of the health and safety plan is provided in Section 3.4.9 of this report.

f) a list of any necessary federal, state or local permits, licenses and/or approvals required for the design, construction and/or operation of the selected remedial action alternative and a description of any additional information needed to meet the requirements thereof; and

A list of necessary federal, state, or local permits is provided in Section 3.7 of this report.

g) a discussion of any property access issues which are relevant to the implementation of the Comprehensive Remedial Action, and a plan and timetable for resolving property access problems.

A discussion of property access issues is provided in Section 3.8 of this report.

5.0 LIMITATIONS

This Phase IV – Remedy Implementation Plan Modification was prepared for the use of DCAMM, exclusively. The findings provided by Weston & Sampson in this report are based solely on the information reported in this document. Future investigations, and/or information that was not available to Weston & Sampson at the time of the investigation, may result in a modification of the findings stated in this report.

Should additional information become available concerning this Site or neighboring properties which could directly impact the Site in the future, that information should be made available to Weston & Sampson for review so that, if necessary, conclusions presented in this report may be modified. The conclusions of this report are based on Site conditions observed by Weston & Sampson personnel at the time of the investigation, information provided by DCAMM and samples collected and analyzed on the dates shown or stated in this report. This report has been prepared in accordance with generally accepted engineering and geological practices. No other warranty, express or implied, is made.

FIGURES

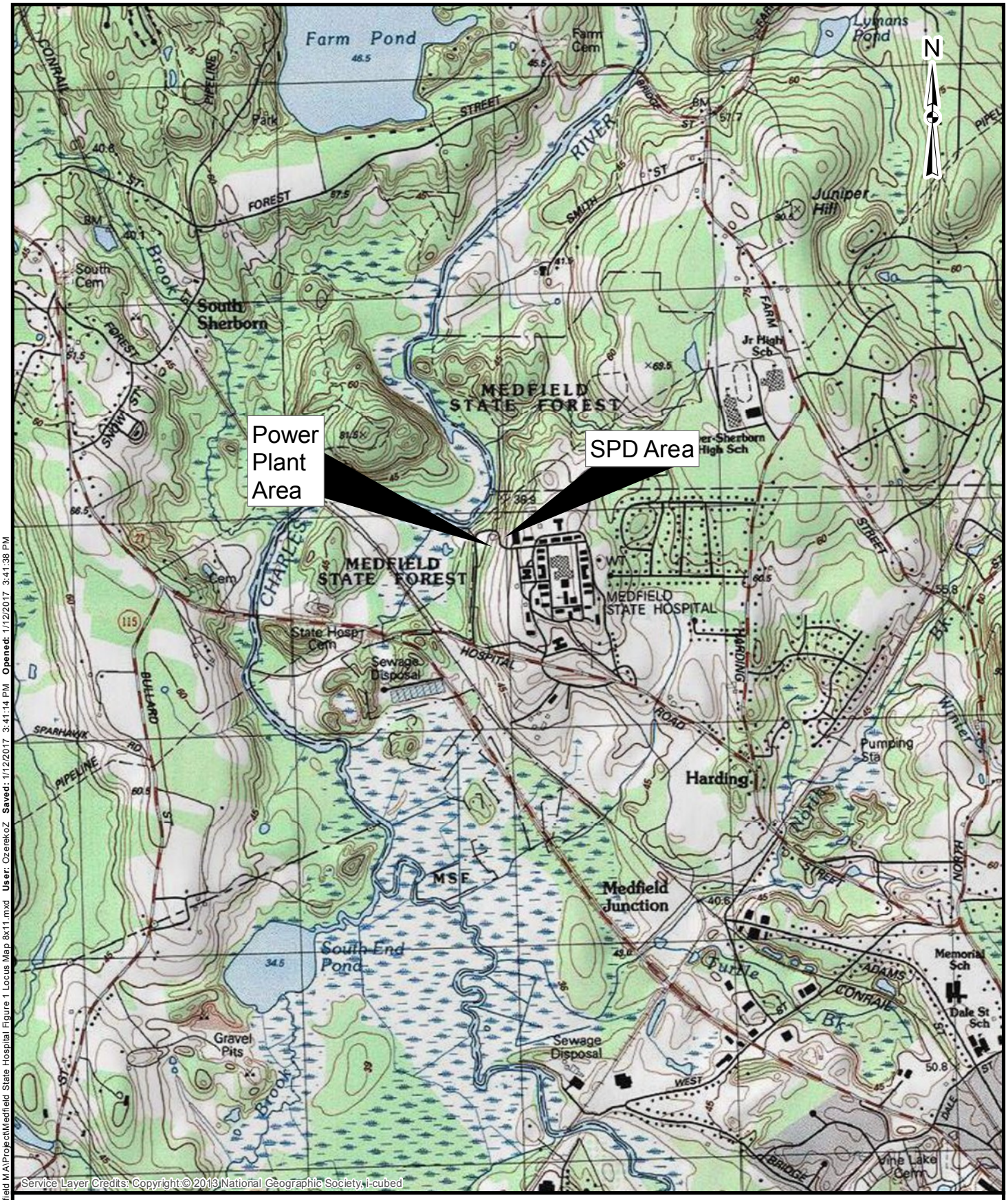


FIGURE 1
45 HOSPITAL ROAD
MEDFIELD, MASSACHUSETTS

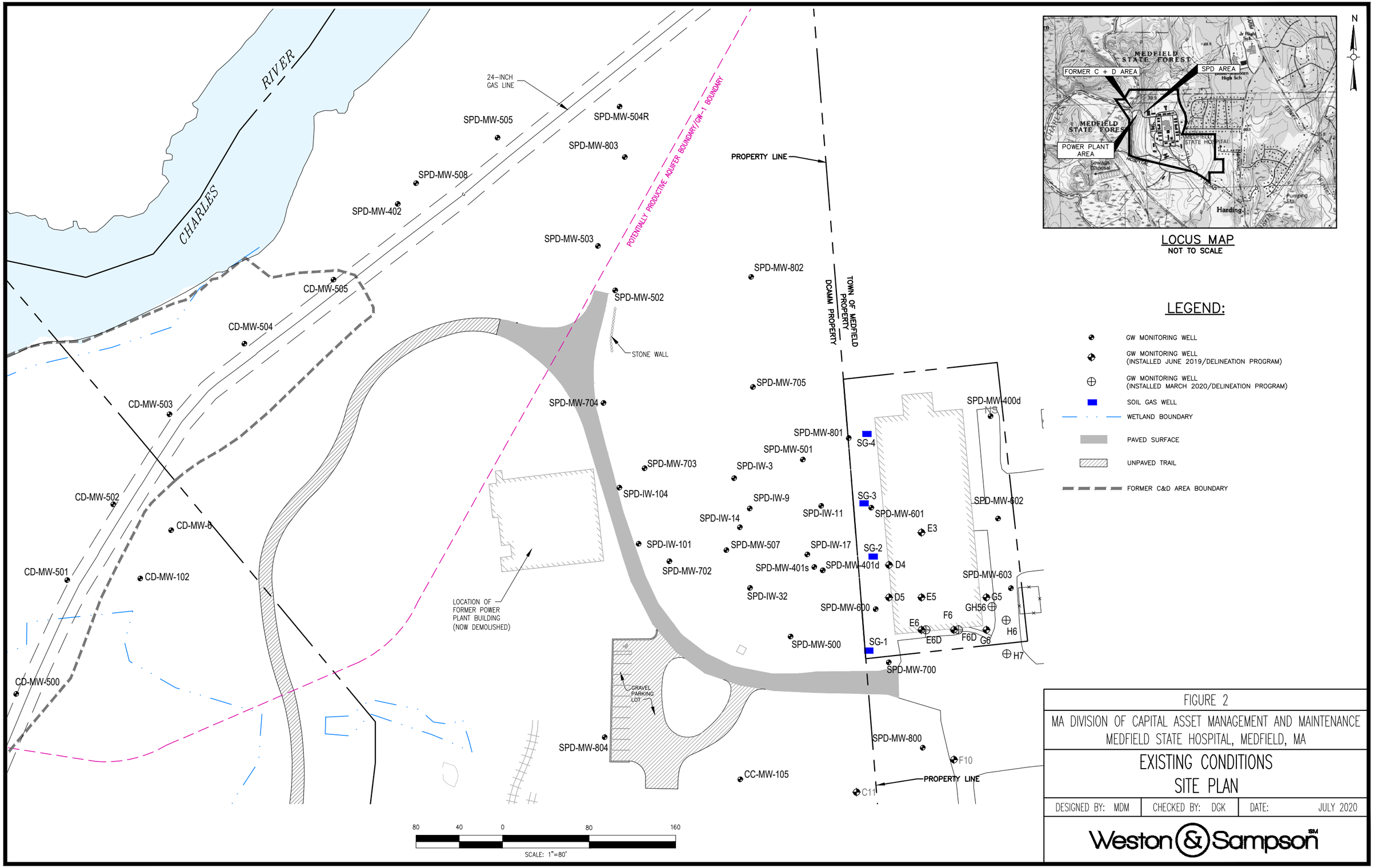
LOCUS MAP

0 2,000 4,000

Scale in Feet

Weston & Sampson

Path: \\gisdatasrv\GIS\DataStore\Client\Medfield MA\Project\Medfield State Hospital Figure 1 Locus Map 8x11.mxd User: OzerekoZ Saved: 1/12/2017 3:41:14 PM Opened: 1/12/2017 3:41:38 PM



LOCUS MAP
NOT TO SCALE

LEGEND:

- GW MONITORING WELL
- GW MONITORING WELL (INSTALLED JUNE 2019/DELINEATION PROGRAM)
- GW MONITORING WELL (INSTALLED MARCH 2020/DELINEATION PROGRAM)
- SOIL GAS WELL
- WETLAND BOUNDARY
- PAVED SURFACE
- UNPAVED TRAIL
- FORMER C&D AREA BOUNDARY

FIGURE 2

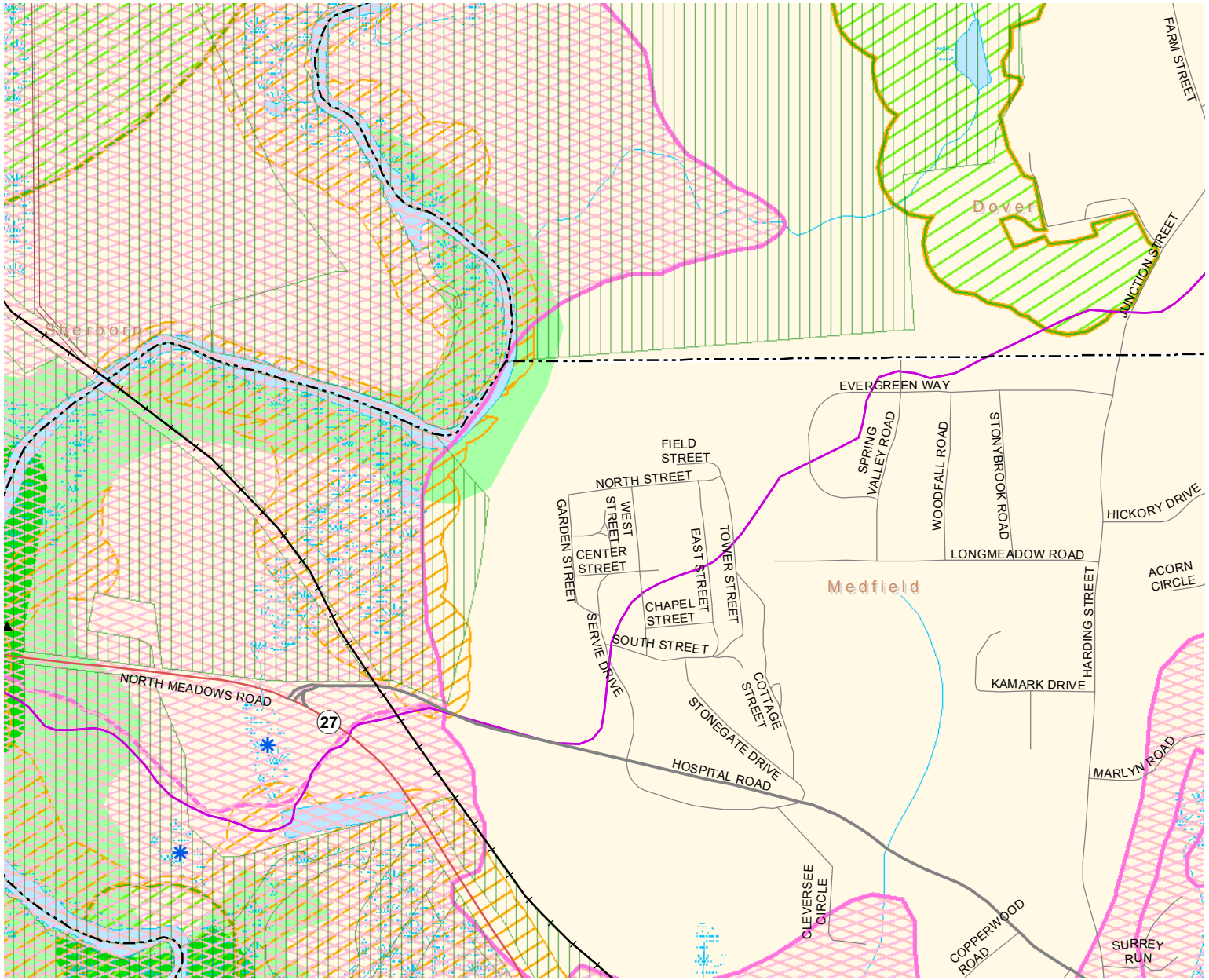
MA DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE
MEDFIELD STATE HOSPITAL, MEDFIELD, MA

EXISTING CONDITIONS SITE PLAN

DESIGNED BY: MDM	CHECKED BY: DGK	DATE: JULY 2020

Weston & Sampson℠

\\wse03.local\WSE\Projects\MA\DCAMM\Medfield State Hospital\CAD\Groundwater Sampling\7 - May 2020\Figure 2 - Exist Conds Site Plan.dwg



N
W E
S

1,000 500 0 1,000 Feet

0.2 0.1 0 0.2 Miles

Data Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

Notes:

Legend

- Town Boundaries
- State Boundary
- Ground Water
- Surface Water
- Non-Community
- NHESP Certified Vernal Pools
- Railroads by Ownership
- Pipeline
- Pipeline Arbitrary Extension
- Powerline
- Powerline Arbitrary Extension
- Ski Lift/Tramway
- Substation
- Landing Strip/Airport
- Highway Exit Locations

All Roads

Road Classification

- Limited Access Highway
- Multi-lane Hwy, not limited access
- Other Numbered Highway
- Major Road, Collector
- Minor Road, Arterial

- Sub-basins
- Major Basins
- Solid Waste Facilities
- Protected Open Space
- ACECs
- Zone A
- IWPAs
- DEP Approved Zone IIs
- River, Stream, Shoreline
- Water
- Wetland
- Sole Source Aquifers
- NHESP Estimated Habitats of Rare Wildlife
- NHESP Priority Habitats of Rare Species

Non Potential Drinking Water Source Area

- High Yield
- Medium Yield

Aquifers

- High Yield
- Medium Yield

FIGURE 3

Area Receptors Map
Medfield State Hospital
45 Hospital Road
Medfield, MA

Weston & Sampson

CHARLES RIVER

24-INCH GAS LINE

SPD-MW-505 ND (<1.0)

SPD-MW-504R 3.3

SPD-MW-803 NS

SPD-MW-508 NS

SPD-MW-402 27

SPD-MW-503 NS

POTENTIALLY PRODUCTIVE AQUIFER BOUNDARY/GW-1 BOUNDARY

PROPERTY LINE

SPD-MW-802 2.9

TOWN OF MEDFIELD PROPERTY

DCAMM PROPERTY

CD-MW-505 16

CD-MW-504 1.3

SPD-MW-502 15

STONE WALL

CD-MW-503 ND (<1.0)

SPD-MW-704 52

SPD-MW-705 NS

SPD-MW-400d NS

SPD-MW-801 4.1

SPD-MW-501 99

SPD-MW-703 NS

SPD-IW-3 NS

CD-MW-502 ND (<1.0)

SPD-IW-104 120

SPD-IW-9 NS

SPD-IW-11 NS

SPD-IW-14 NS

SPD-MW-601 6.9

SPD-MW-602 ND (<1.0)

CD-MW-6 NS

SPD-IW-101 140

SPD-MW-507 NS

SPD-IW-17 NS

CD-MW-501 ND (<1.0)

CD-MW-102 NS

SPD-MW-702 NS

SPD-MW-401s 190

SPD-MW-401d NS

SPD-MW-603 ND (<1.0)

LOCATION OF FORMER POWER PLANT BUILDING (NOW DEMOLISHED)

SPD-IW-32 150

SPD-MW-600 690

GH56 1.1

F6 7400

H6 ND (<1.0)

E6D 8.5

F6D 2.8

G6 120

H7 2.0

SPD-MW-500 47

SPD-MW-700 ND (<1.0)

CD-MW-500 ND (<1.0)

GRAVEL PARKING LOT

SPD-MW-804 2.0

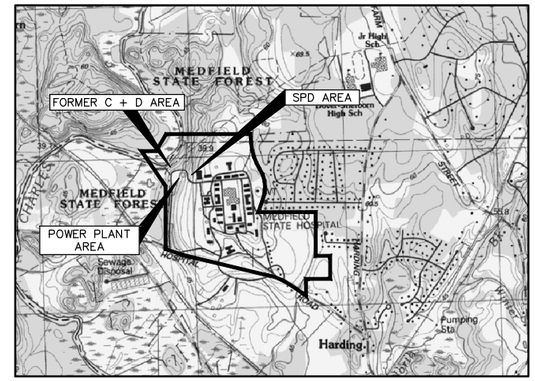
SPD-MW-800 ND (<1.0)

CC-MW-105 NS

PROPERTY LINE

80 40 0 80 160

SCALE: 1"=80'



LOCUS MAP
NOT TO SCALE

LEGEND:

- GW MONITORING WELL
- GW MONITORING WELL (INSTALLED JUNE 2019/DELINEATION PROGRAM)
- GW MONITORING WELL (INSTALLED MARCH 2020/DELINEATION PROGRAM)
- GW MONITORING WELL (NOT SAMPLED AS PART OF THE FEBRUARY 2020 EVENT)
- WETLAND BOUNDARY
- PCE CONCENTRATIONS > GW-1 (5-49 ug/L)
- PCE CONCENTRATIONS > GW-2 (>50 ug/L)
- INFERRED PCE ISOCONTOUR
- FORMER C&D AREA BOUNDARY
- 7400 MAY 2020 RESULTS (PCE)

NOTES:

1. GROUNDWATER DATA COLLECTED MAY 20-22, 2020.
2. PCE IS TETRACHLOROETHYLENE.
3. ISO CONTOURS ARE BASED ON INTERPOLATION OF SHALLOW GROUNDWATER WELL DATA. DEEP GROUNDWATER WELL DATA SUCH AS E6D AND F6D ARE NOT INCLUDED IN ISO CONTOURS.
4. ND = NON-DETECT
5. NS = NO SAMPLE TAKEN
6. LOCATIONS FOR TEMPORARY GROUNDWATER MONITORING AND GROUNDWATER MONITORING WELLS INSTALLED DURING THE DELINEATION PROGRAM IN JUNE 2019 ARE APPROXIMATE. A SURVEY WILL BE CONDUCTED AFTER ONGOING DELINEATION ACTIVITIES ARE COMPLETED.

FIGURE 4

MA DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE
MEDFIELD STATE HOSPITAL, MEDFIELD, MA

PCE EXTENT IN OVERBURDEN GROUNDWATER MAY 2020

DESIGNED BY: MDM	CHECKED BY: DGK	DATE: JULY 2020

Weston & Sampson℠

CHARLES RIVER

24-INCH GAS LINE

SPD-MW-505
3.46, 36, 5.54'

SPD-MW-504R
3.36, 5.4, 11.72'

SPD-MW-803
3.2, 3.2, 5.85'

SPD-MW-508
6.87, 21, 4.56'

SPD-MW-402
29.84, 72, 5.27'

SPD-MW-503
4.81, 7.9, 11.94'

POTENTIALLY PRODUCTIVE AQUIFER BOUNDARY/GW-1 BOUNDARY

PROPERTY LINE

TOWN OF MEDFIELD PROPERTY
DCAMM PROPERTY

SPD-MW-802
4.19, 8.0, 6.46'

SPD-MW-502
8.54, 32, 4.38'

CD-MW-505
9.87, 29, 3.86'

CD-MW-504
1.56, 2.0, 5.97'

STONE WALL

SPD-MW-705
38, 160, 9.58'

SPD-MW-704
32.08, 66, 10.29'

SPD-MW400d
0.5, 0.5, 9.99'

SPD-MW-501
85.74, 200, 7.46'

SPD-MW-801
6.81, 12, 9.55'

CD-MW-503
0.5, 0.5, 8.60'

SPD-MW-703

SPD-IW-3
84, 190, 11.83'

SPD-IW-11
93, 360, 7.57'

SPD-IW-104
80.46, 150, 15.77'

SPD-IW-9
119, 450, 9.83'

SPD-MW-602
0.5, 0.5, 11.53'

CD-MW-502
0.5, 0.5, 6.97'

SPD-IW-14
72, 140, 12.59'

SPD-MW-601
11.51, 23, 9.80'

E3

CD-MW-8
1.08, 2.5, 9.58'

SPD-IW-17
44, 66, 8.95'

SPD-IW-101
115.50, 300, 16.33'

SPD-MW-507
126, 300, 13.27'

D4

SPD-MW-702

SPD-MW-401s
362.53, 1700, 9.60'

SPD-MW-603
0.81, 1.8, 13.45'

CD-MW-501
0.54, 1.2, 4.33'

CD-MW-102
0.5, 0.5, 8.17'

SPD-MW-401d
5.80, 14, 10.34'

SPD-IW-32
128.19, 230, 12.21'

D5

E5

G5

GH56
1.1, 1.1, 10.74'

SPD-MW-600
251, 710, 12.86'

E6D
8.5, 8.5, 9.91'

F6D
2.8, 2.8, 10.57'

H6
2.0, 2, 13.32'

G6
205, 290, 9.92'

LOCATION OF FORMER POWER PLANT BUILDING (NOW DEMOLISHED)

E6

F6
6675, 13000, 12.71'

SPD-MW-500
57.41, 280, 11.21'

G7

H7
2.0, 2.0, 13.32'

SPD-MW-700
26.06, 130, 13.12'

CD-MW-500
0.5, 0.5, 1.90'

GRAVEL PARKING LOT

SPD-MW-804
0.69, 2, 17.56'

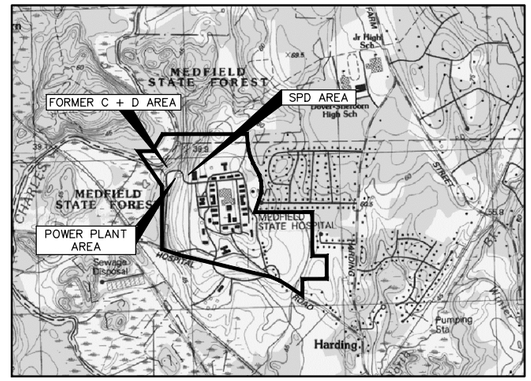
CC-MW-105
0.5, 0.5, 13.47'

SPD-MW-800
0.5, 0.5, 12.10'

F10

PROPERTY LINE

C11



LOCUS MAP
NOT TO SCALE

N

LEGEND:

- GW MONITORING WELL
- GW MONITORING WELL (INSTALLED JUNE 2019)
- GW MONITORING WELL (INSTALLED MARCH 2020)
- GW MONITORING WELL (NOT SAMPLED)
- WETLAND BOUNDARY
- PCE CONCENTRATIONS > GW-1 (5-49 ug/L)
- PCE CONCENTRATIONS > GW-2 (>50 ug/L)
- INFERRED PCE ISOCONTOUR
- FORMER C&D AREA BOUNDARY
- 6433, 13000, 13.66' — AVERAGE PCE RESULT, MAXIMUM PCE RESULT, AVERAGE DEPTH TO WATER (POST-ISCO INJECTIONS)

NOTES:

1. GROUNDWATER DATA COLLECTED FROM MARCH 2015 TO MAY 2020.
2. PCE IS TETRACHLOROETHYLENE.
3. ISO CONTOURS ARE BASED ON INTERPOLATION OF AVERAGED PCE RESULTS IN SHALLOW GROUNDWATER WELLS. DEEP GROUNDWATER WELLS SUCH AS E6D AND F6D ARE NOT INCLUDED IN ISOCONTOURS.
4. MONITORING WELLS SPD-IW-101 AND SPD-IW-104 WERE DAMAGED IN 2017 AND REPAIRED DURING 2019 MAINTENANCE ACTIVITIES.
5. ISOCONTOURS ACCOUNT FOR SOIL AND GROUNDWATER DELINEATION RESULTS FROM 2019 AND 2020.
6. GROUNDWATER MONITORING WELLS REPRESENTED IN GRAY WERE NOT SAMPLED DURING THE MAY 2020 GROUNDWATER SAMPLING ROUND. AVERAGE PCE RESULT, MAXIMUM PCE RESULT, AND AVERAGE DEPTH TO WATER SHOWN FOR WELLS THAT WERE NOT SAMPLED DURING THE MAY 2020 GROUNDWATER SAMPLING ROUND REPRESENT THE RESULTS FOR THE LAST SAMPLING ROUND THE GROUNDWATER MONITORING WELLS WERE INCLUDED IN.

80 40 0 80 160
SCALE: 1"=80'

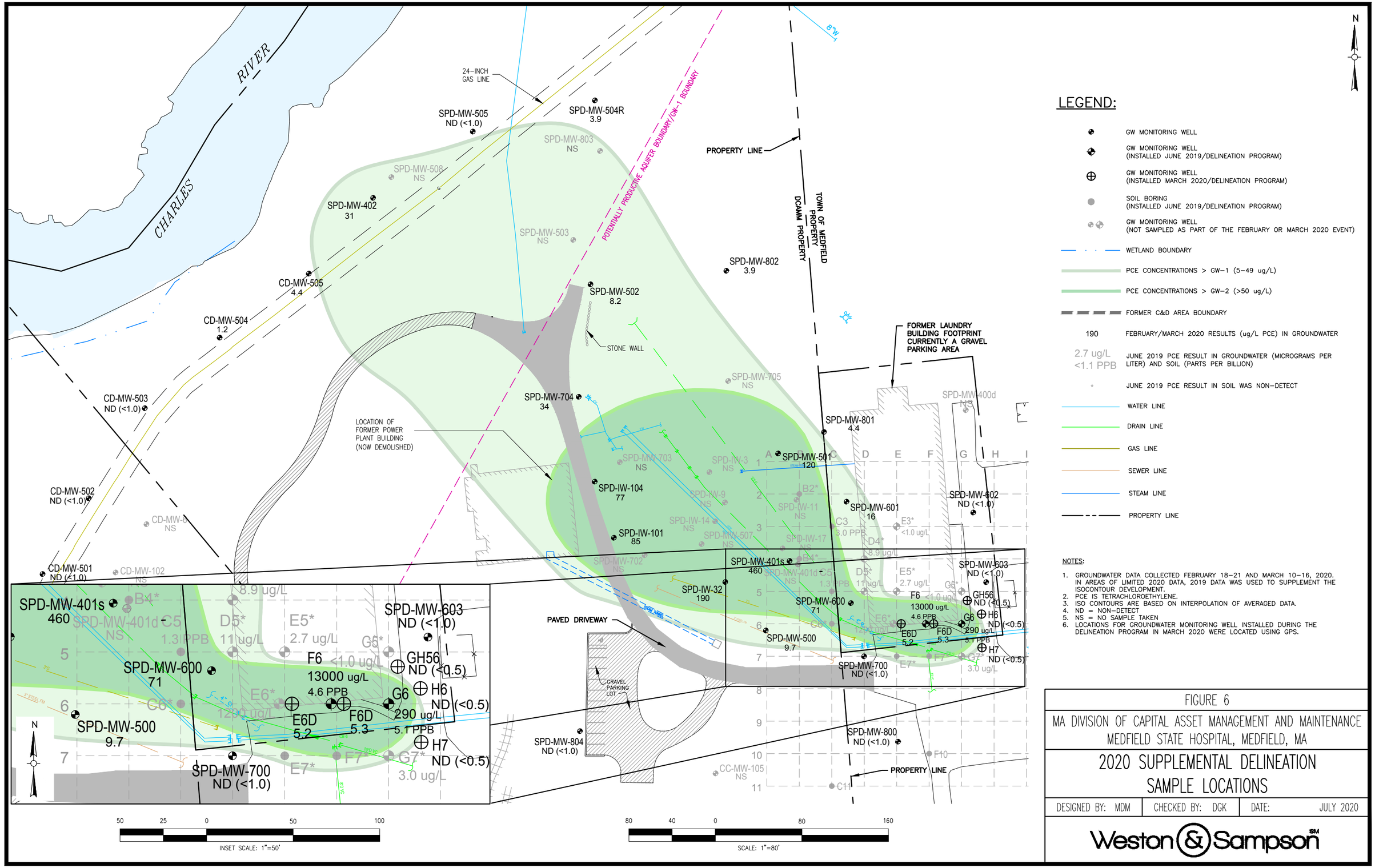
FIGURE 5

MA DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE
MEDFIELD STATE HOSPITAL, MEDFIELD, MA

AVERAGE PCE PLUME MAP
POST-ISCO INJECTIONS (2015-2020)

DESIGNED BY: MDM	CHECKED BY: DGK	DATE: JULY 2020

Weston & Sampson



LEGEND:

- GW MONITORING WELL
- GW MONITORING WELL (INSTALLED JUNE 2019/DELINEATION PROGRAM)
- GW MONITORING WELL (INSTALLED MARCH 2020/DELINEATION PROGRAM)
- SOIL BORING (INSTALLED JUNE 2019/DELINEATION PROGRAM)
- GW MONITORING WELL (NOT SAMPLED AS PART OF THE FEBRUARY OR MARCH 2020 EVENT)
- WETLAND BOUNDARY
- PCE CONCENTRATIONS > GW-1 (5-49 ug/L)
- PCE CONCENTRATIONS > GW-2 (>50 ug/L)
- FORMER C&D AREA BOUNDARY
- 190 — FEBRUARY/MARCH 2020 RESULTS (ug/L PCE) IN GROUNDWATER
- 2.7 ug/L <1.1 PPB — JUNE 2019 PCE RESULT IN GROUNDWATER (MICROGRAMS PER LITER) AND SOIL (PARTS PER BILLION)
- * — JUNE 2019 PCE RESULT IN SOIL WAS NON-DETECT
- WATER LINE
- DRAIN LINE
- GAS LINE
- SEWER LINE
- STEAM LINE
- PROPERTY LINE

NOTES:

1. GROUNDWATER DATA COLLECTED FEBRUARY 18-21 AND MARCH 10-16, 2020. IN AREAS OF LIMITED 2020 DATA, 2019 DATA WAS USED TO SUPPLEMENT THE ISOCONTOUR DEVELOPMENT.
2. PCE IS TETRACHLOROETHYLENE.
3. ISO CONTOURS ARE BASED ON INTERPOLATION OF AVERAGED DATA.
4. ND = NON-DETECT
5. NS = NO SAMPLE TAKEN
6. LOCATIONS FOR GROUNDWATER MONITORING WELL INSTALLED DURING THE DELINEATION PROGRAM IN MARCH 2020 WERE LOCATED USING GPS.

FIGURE 6

MA DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE
MEDFIELD STATE HOSPITAL, MEDFIELD, MA

2020 SUPPLEMENTAL DELINEATION SAMPLE LOCATIONS

DESIGNED BY: MDM	CHECKED BY: DGK	DATE: JULY 2020

Weston & Sampson℠

\\wse03.local\WSE\Projects\MA\DCAMM\Medfield State Hospital\CAD\3_SPD Phase IV Status Report\Figure 6 - Feb and March 2020 PCE Results.dwg

CHARLES RIVER

24-INCH GAS LINE

TOWN OF MEDFIELD PROPERTY

DCAMM PROPERTY

PROPERTY LINE

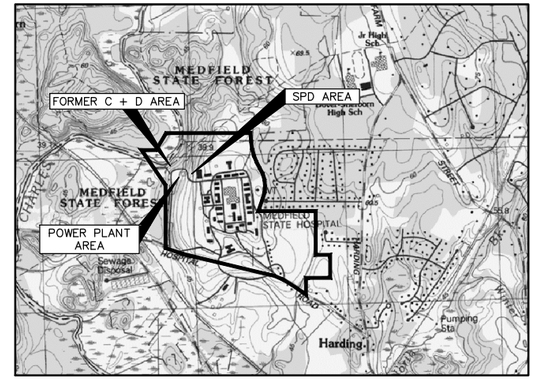
STONE WALL

POTENTIALLY PRODUCTIVE AQUIFER BOUNDARY/GW-1 BOUNDARY

LOCATION OF FORMER POWER PLANT BUILDING (NOW DEMOLISHED)

GRAVEL PARKING LOT

SPD-MW-505 (113.71)
SPD-MW-504R (118.91)
SPD-MW-803
SPD-MW-508
SPD-MW-402 (114.85)
SPD-MW-503
SPD-MW-802 (160.77)
SPD-MW-502 (141.84)
SPD-MW-704 (146.33)
SPD-MW-705
SPD-MW-400d
SPD-MW-801 (175.43)
SPD-MW-703
SPD-IW-3
SPD-MW-501 (173.56)
SPD-IW-104 (152.41)
SPD-IW-9
SPD-IW-14
SPD-IW-11
SPD-MW-601 (177.13)
SPD-MW-602 (183.27)
SPD-IW-101 (DRY)
SPD-MW-507
SPD-IW-17
SPD-MW-702
SPD-MW-401s (175.02)
SPD-MW-401d (174.38)
SPD-IW-32 (155.17)
SPD-MW-603 (188.16)
SPD-MW-600 (178.18)
SPD-MW-500 (173.75)
SPD-MW-700 (180.28)
SPD-MW-804 (DRY)
SPD-MW-800 (DRY)
CC-MW-105
CD-MW-505 (115.99)
CD-MW-504 (116.72)
CD-MW-503 (117.21)
CD-MW-502 (117.20)
CD-MW-6
CD-MW-501 (116.96)
CD-MW-102
CD-MW-500 (116.59)
D4
D5
E3
E5
E6
F6
G5
G6
F10
C11



LOCUS MAP
NOT TO SCALE

N

LEGEND:

- GW MONITORING WELL
- GW MONITORING WELL (INSTALLED JUNE 2019/DELINEATION PROGRAM)
- GW MONITORING WELL (NOT SAMPLED AS PART OF THE FEBRUARY 2020 EVENT)
- WETLAND BOUNDARY
- 68 GROUNDWATER CONTOUR ELEVATION
- GROUNDWATER FLOW DIRECTION
- (188.16) GROUNDWATER ELEVATION

NOTES:

1. GROUNDWATER DATA ELEVATION COLLECTED NOVEMBER 18, 2019.
2. GROUNDWATER CONTOURS ARE BASED ON INTERPOLATION OF SHALLOW GROUNDWATER WELL ELEVATION DATA. DEEP GROUNDWATER WELL DATA SUCH AS SPD-MW-401d ARE NOT INCLUDED IN GROUNDWATER CONTOURS.
3. LOCATIONS FOR TEMPORARY GROUNDWATER MONITORING AND GROUNDWATER MONITORING WELLS INSTALLED DURING THE DELINEATION PROGRAM IN JUNE 2019 ARE APPROXIMATE. A SURVEY WILL BE CONDUCTED AFTER ONGOING DELINEATION ACTIVITIES ARE COMPLETED.

80 40 0 80 160
SCALE: 1"=80'

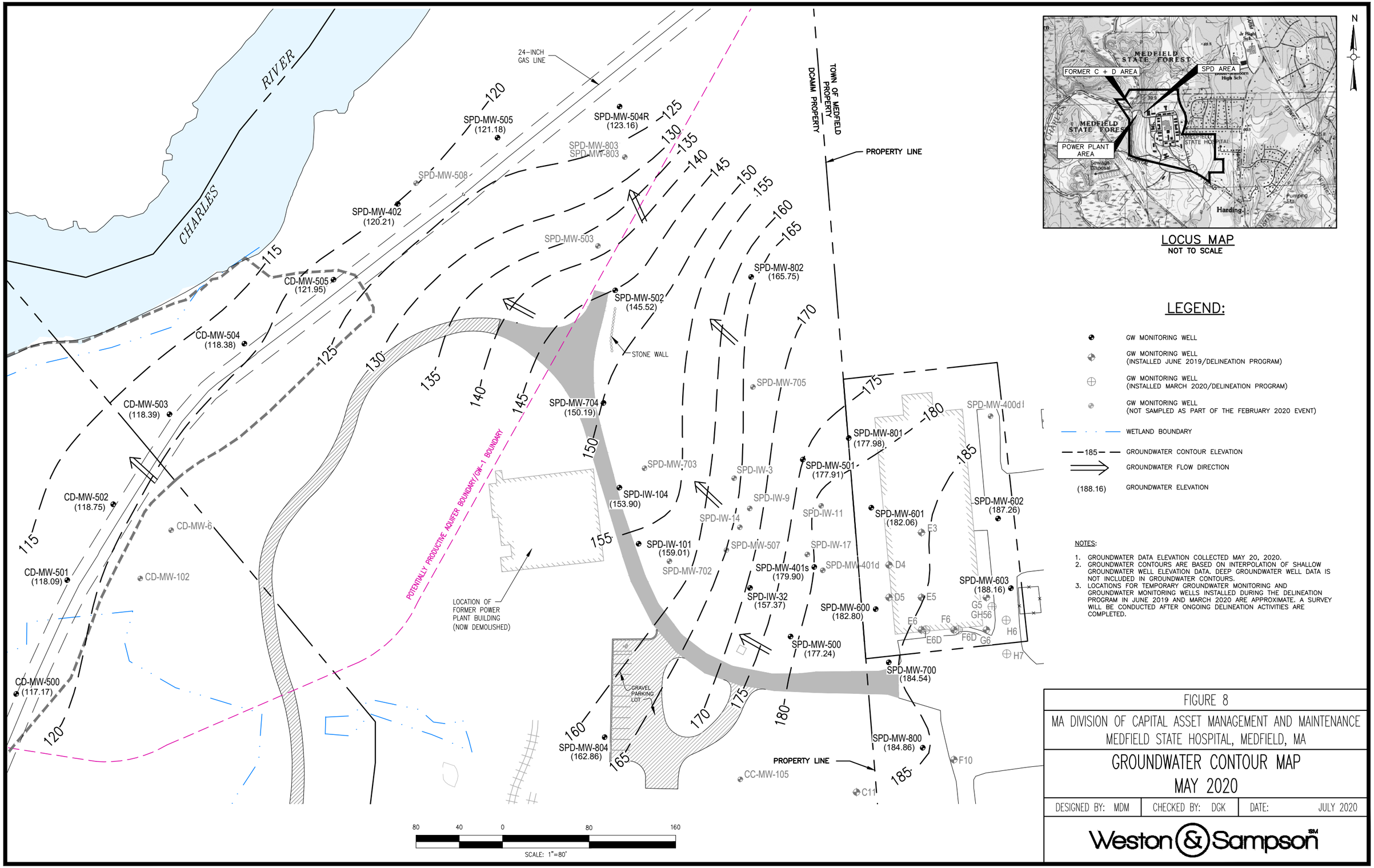
FIGURE 7

MA DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE
MEDFIELD STATE HOSPITAL, MEDFIELD, MA

GROUNDWATER CONTOUR MAP NOVEMBER 2019

DESIGNED BY: MDM	CHECKED BY: DGK	DATE: JULY 2020

Weston & Sampson℠



LOCUS MAP
NOT TO SCALE

LEGEND:

- GW MONITORING WELL
- GW MONITORING WELL (INSTALLED JUNE 2019/DELINEATION PROGRAM)
- GW MONITORING WELL (INSTALLED MARCH 2020/DELINEATION PROGRAM)
- GW MONITORING WELL (NOT SAMPLED AS PART OF THE FEBRUARY 2020 EVENT)
- WETLAND BOUNDARY
- 185 GROUNDWATER CONTOUR ELEVATION
- GROUNDWATER FLOW DIRECTION
- (188.16) GROUNDWATER ELEVATION

NOTES:

1. GROUNDWATER DATA ELEVATION COLLECTED MAY 20, 2020.
2. GROUNDWATER CONTOURS ARE BASED ON INTERPOLATION OF SHALLOW GROUNDWATER WELL ELEVATION DATA. DEEP GROUNDWATER WELL DATA IS NOT INCLUDED IN GROUNDWATER CONTOURS.
3. LOCATIONS FOR TEMPORARY GROUNDWATER MONITORING AND GROUNDWATER MONITORING WELLS INSTALLED DURING THE DELINEATION PROGRAM IN JUNE 2019 AND MARCH 2020 ARE APPROXIMATE. A SURVEY WILL BE CONDUCTED AFTER ONGOING DELINEATION ACTIVITIES ARE COMPLETED.

FIGURE 8

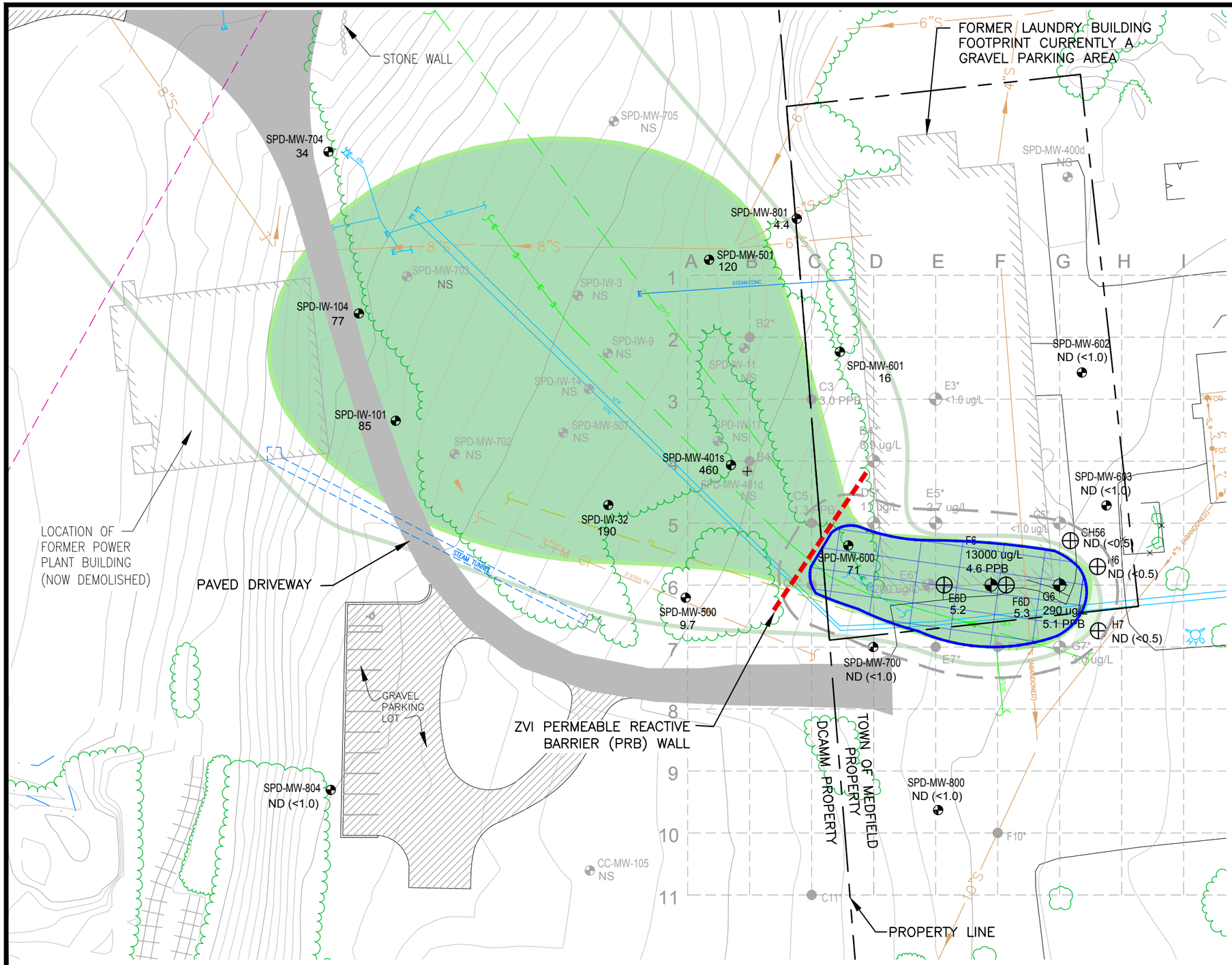
MA DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE
MEDFIELD STATE HOSPITAL, MEDFIELD, MA

GROUNDWATER CONTOUR MAP
MAY 2020

DESIGNED BY: MDM	CHECKED BY: DGK	DATE: JULY 2020

Weston & Sampson℠

\\wse03.local\WSE\Projects\MA\DCAMM\Medfield State Hospital\CAD\3_SPD Phase IV Status Report\Figure 8 – May 2020 GW Flow.dwg



LEGEND:

- GW MONITORING WELL
- GW MONITORING WELL (INSTALLED JUNE 2019/DELINEATION PROGRAM)
- GW MONITORING WELL (INSTALLED MARCH 2020/DELINEATION PROGRAM)
- SOIL BORING (INSTALLED JUNE 2019/DELINEATION PROGRAM)
- GW MONITORING WELL (NOT SAMPLED AS PART OF THE FEBRUARY OR MARCH 2020 EVENT)
- WETLAND BOUNDARY
- PCE CONCENTRATIONS > GW-1 (5-49 ug/L)
- PCE CONCENTRATIONS > GW-2 (>50 ug/L)
- 190 — FEBRUARY/MARCH 2020 RESULTS (ug/L PCE) IN GROUNDWATER
- 2.7 ug/L <1.1 PPB — JUNE 2019 PCE RESULT IN GROUNDWATER (MICROGRAMS PER LITER) AND SOIL (PARTS PER BILLION)
- * — JUNE 2019 PCE RESULT IN SOIL WAS NON-DETECT
- SOURCE AREA SOIL REMOVAL AREA
- UNSATURATED ZONE SOIL EXCAVATION
- ZVI PERMEABLE REACTIVE BARRIER (PRB) WALL
- WATER LINE
- DRAIN LINE
- GAS LINE
- SEWER LINE
- STEAM LINE
- PROPERTY LINE
- ELEVATION CONTOUR
- TREE LINE

NOTES:

1. GROUNDWATER DATA COLLECTED FEBRUARY 18-21 AND MARCH 10-16, 2020. IN AREAS OF LIMITED 2020 DATA, 2019 DATA WAS USED TO SUPPLEMENT THE ISOCONTOUR DEVELOPMENT.
2. PCE IS TETRACHLOROETHYLENE.
3. ISO CONTOURS ARE BASED ON INTERPOLATION OF AVERAGED DATA.
4. ND = NON-DETECT
5. NS = NO SAMPLE TAKEN
6. LOCATIONS FOR GROUNDWATER MONITORING WELL INSTALLED DURING THE DELINEATION PROGRAM IN MARCH 2020 WERE LOCATED USING GPS.

FIGURE 9

MA DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE
MEDFIELD STATE HOSPITAL, MEDFIELD, MA

SPD AREA REMEDIATION PLAN

DESIGNED BY: NWA	CHECKED BY: DGK	DATE: AUGUST 2020

Weston & Sampson

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SPD-IW-3
NS
SPD-IW-9
NS
SPD-IW-14
NS
SPD-MW-507
NS
SPD-IW-11
NS
SPD-IW-17
NS
SPD-MW-401d
NS
SPD-MW-401s
460
SPD-IW-32
190
SPD-MW-601
16
SPD-MW-602
ND (<1.0)
SPD-MW-603
ND (<1.0)
SPD-MW-600
71
SPD-MW-500
9.7
SPD-MW-700
ND (<1.0)
SPD-MW-800
ND (<1.0)
CH56
ND (<0.5)
N6
ND (<0.5)
H7
ND (<0.5)
C3
3.0 PPB
C5
1.3 PPB
E3*
<1.0 ug/L
B4*
8.9 ug/L
D5*
11 ug/L
E5*
2.7 ug/L
F5*
<1.0 ug/L
F6
13000 ug/L
4.6 PPB
E6D
5.2
F6D
5.3
G6
290 ug/L
5.1 PPB
G7*
2.0 ug/L
E7*
F10*
B2*
B4*
STEAM-CONC.
12"D.I.
10"W
3"G
3"FM-CI
3" STEEL FM
4"S (ABANDONED)
3"D.I.C.
CB-6
FCO
ZVI PERMEABLE REACTIVE BARRIER (PRB) WALL
TOWN OF MEDFIELD PROPERTY
DCAMM PROPERTY

LEGEND:

- GW MONITORING WELL
- GW MONITORING WELL (INSTALLED JUNE 2019/DELINEATION PROGRAM)
- GW MONITORING WELL (INSTALLED MARCH 2020/DELINEATION PROGRAM)
- SOIL BORING (INSTALLED JUNE 2019/DELINEATION PROGRAM)
- GW MONITORING WELL (NOT SAMPLED AS PART OF THE FEBRUARY OR MARCH 2020 EVENT)
- WETLAND BOUNDARY
- PCE CONCENTRATIONS > GW-1 (5-49 ug/L)
- PCE CONCENTRATIONS > GW-2 (>50 ug/L)
- 190 — FEBRUARY/MARCH 2020 RESULTS (ug/L PCE) IN GROUNDWATER
- 2.7 ug/L <1.1 PPB — JUNE 2019 PCE RESULT IN GROUNDWATER (MICROGRAMS PER LITER) AND SOIL (PARTS PER BILLION)
- * — JUNE 2019 PCE RESULT IN SOIL WAS NON-DETECT
- SOURCE SOIL AREA REMOVAL AREA
- UNSATURATED ZONE SOIL EXCAVATION
- ZVI PERMEABLE REACTIVE BARRIER (PRB) WALL
- WATER LINE
- DRAIN LINE
- GAS LINE
- SEWER LINE
- STEAM LINE
- PROPERTY LINE
- ELEVATION CONTOUR
- TREE LINE
- PROPOSED REPLACEMENT MONITORING WELL LOCATIONS POST-REMEDIATION

NOTES:

1. GROUNDWATER DATA COLLECTED FEBRUARY 18-21 AND MARCH 10-16, 2020. IN AREAS OF LIMITED 2020 DATA, 2019 DATA WAS USED TO SUPPLEMENT THE ISOCONTOUR DEVELOPMENT.
2. PCE IS TETRACHLOROETHYLENE.
3. ISO CONTOURS ARE BASED ON INTERPOLATION OF AVERAGED DATA.
4. ND = NON-DETECT
5. NS = NO SAMPLE TAKEN
6. LOCATIONS FOR GROUNDWATER MONITORING WELL INSTALLED DURING THE DELINEATION PROGRAM IN MARCH 2020 WERE LOCATED USING GPS.

50 25 0 50 100
SCALE: 1"=50'

NOT FOR CONSTRUCTION

FIGURE 10

MA DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE
MEDFIELD STATE HOSPITAL, MEDFIELD, MA

SPD AREA REMEDIATION PLAN
DETAILED VIEW

DESIGNED BY: NWA	CHECKED BY: DGK	DATE: AUGUST 2020

Weston & Sampson℠

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TABLES

Table 1
Groundwater Elevations
DCAMM - Medfield State Hospital - All Areas
Medfield, Massachusetts
May 15, 2017 through May 20, 2020

Location/ Monitoring Well	Well Diameter (inches)	Well Depth (feet)	Elevation of Measuring Point - Top of PVC (feet) or River Bottom (feet)	GW Elevation (ft amsl)	Depth to Water (ft)	GW Elevation (ft amsl)	Depth to Water (ft)	GW Elevation (ft amsl)	Depth to Water (ft)	GW Elevation (ft amsl)	Depth to Water (ft)	GW Elevation (ft amsl)	Depth to Water (ft)	GW Elevation (ft amsl)	Depth to Water (ft)	GW Elevation (ft amsl)	Depth to Water (ft)	GW Elevation (ft amsl)	Depth to Water (ft)	GW Elevation (ft amsl)
				5/15/2017	8/29/2017	8/29/2017	12/4/2017	12/4/2017	12/3/2018	12/3/2018	5/28/2019	5/28/2019	8/28/2019	8/28/2019	11/18/2019	11/18/2019	2/18/2020	2/18/2020	5/20/2020	5/20/2020
C&D Area																				
CD-MW-6	2	19.03	131.35	122.03	11.32	120.03	9.06	122.29	-	-	--	--	--	--	--		--		--	
CD-MW-102	2	18.15	129.07	121.17	10.03	119.04	9.3	119.77	-	-	--	--	--	--	--		--		--	
CD-MW-500	2	11.08	120.49	117.14	7.63	112.86	4.66	115.83	2.95	117.54	3.40	117.09	3.70	116.79	3.90	116.59	3.51	116.98	3.32	117.17
CD-MW-501	2	15.50	124.69	117.92	8.68	116.01	7.87	116.82	6.6	118.09	6.90	117.79	7.01	117.68	7.73	116.96	6.97	117.72	6.60	118.09
CD-MW-502	2	17.52	127.92	118.90	11.43	116.49	10.72	117.20	7.84	120.08	9.50	118.42	10.01	117.91	10.72	117.20	9.49	118.43	9.17	118.75
CD-MW-503	2	17.18	129.15	117.85	12.09	117.06	11.94	117.21	9.83	119.32	11.20	117.95	11.70	117.45	11.94	117.21	11.30	117.85	10.76	118.39
CD-MW-504	2	17.64	126.43	117.99	9.74	116.69	10.03	116.40	7.03	119.40	8.50	117.93	8.97	117.46	9.71	116.72	8.61	117.82	8.05	118.38
CD-MW-505	2	14.17	125.55	122.59	9.27	116.28	9.68	115.87	1.2	124.35	4.18	121.37	7.39	118.16	9.56	115.99	5.04	120.51	3.60	121.95
Staff Gauge	N/A	N/A	110.00	-	-	-	-	-	-	-		--	--	--	--	--	--	--	--	--
SPD Area																				
SPD-MW-400(D)	2	17.60	196.05	191.45	11.78	184.27	11.17	184.88	obstructed	-	--	--	--	--		196.05	--	--	--	--
SPD-MW-401(D)	2	30.73	189.60	179.87	14.08	175.52	14.2	175.40	-	-	--	--	--	--	15.22	174.38	--	--	--	--
SPD-MW-401(S)	2	18.72	190.30	180.69	14.04	176.26	14.09	176.21	8.48	181.82	11.10	179.20	14.20	176.10	15.28	175.02	10.80	179.50	10.40	179.90
SPD-MW-402	2	16.61	125.28	120.42	10.12	115.16	10.59	114.69	2.96	122.32	5.60	119.68	8.86	116.42	10.43	114.85	6.42	118.86	5.07	120.21
SPD-MW-500	2	17.89	189.82	177.85	15.75	174.07	15.76	174.06	10.82	179.00	13.20	176.62	14.68	175.14	16.07	173.75	12.92	176.90	12.58	177.24
SPD-MW-501	2	16.50	186.59	178.85	12.39	174.20	12.43	174.16	6.03	180.56	9.55	177.04	11.71	174.88	13.03	173.56	8.96	177.63	8.68	177.91
SPD-MW-502	2	14.12	149.02	145.82	5.98	143.04	6.57	142.45	2.45	146.57	3.95	145.07	5.48	143.54	7.18	141.84	3.89	145.13	3.50	145.52
SPD-MW-503	2	20.26	145.19	135.44	13.81	131.38	14.2	130.99	-	-	--	--	10.16	--	--	--	--	--	--	--
SPD-MW-504	2	23.36	136.56	-	obstructed	-	obstructed	-	destroyed	-	--	--	--	--	--	--	--	--	--	--
SPD-MW-504R	2	20.35	136.38	122.97	16.63	119.75	16.52	119.86	9.2	127.18	15.10	121.28	16.76	119.62	17.47	118.91	14.09	122.29	13.22	123.16
SPD-MW-505	2	14.13	124.86	121.38	11.76	113.10	11.53	113.33	2.9	121.96	4.05	120.81	10.09	114.77	11.15	113.71	4.19	120.67	3.68	121.18
SPD-MW-507	1	22.21	183.38	-	17.07	-	obstructed	-	obstructed	-	--	--	--	--	--	--	--	--	--	--
SPD-MW-508	2	14.24	123.92	120.45	9.04	114.88	9.22	114.70	2.56	121.36	--	--	7.90	--	--	--	--	--	--	--
SPD-MW-600	2	21.65	195.77	183.82	17.75	178.02	17.89	177.88	11.24	184.53	14.00	181.77	16.43	179.34	17.59	178.18	13.51	182.26	12.97	182.80
SPD-MW-601	2	19.30	192.52	183.63	14.59	177.93	14.97	177.55	7.71	184.81	11.35	181.17	13.66	178.86	15.39	177.13	10.99	181.53	10.46	182.06
SPD-MW-602	2	18.10	197.80	190.89	14.86	182.94	14.76	183.04	-	-	9.55	188.25	13.36	184.44	14.53	183.27	9.23	188.57	10.54	187.26
SPD-MW-603	2	17.39	198.89	189.37	17.14	181.75	17.41	181.48	6.24	-	--	--	15.46	--	16.98	181.91	11.35	187.54	10.73	188.16
SPD-MW-700	2	22.02	198.61	185.84	18.8	179.81	18.7	179.91	11.76	186.85	14.60	184.01	17.09	181.52	18.33	180.28	14.27	184.34	14.07	184.54
SPD-MW-702	2	18.90	180.16	-	obstructed	-	obstructed	-	-	-	--	--	DRY	--	--	--	--	--	--	--
SPD-MW-703	2	19.90	174.26	156.70	18.59	155.67	DRY	-	-	-	--	--	--	--	--	--	--	--	--	--
SPD-MW-704	2	19.91	161.00	149.82	14.06	146.94	14.68	146.32	7.46	153.54	11.91	149.09	13.21	147.79	14.67	146.33	11.76	149.24	10.81	150.19
SPD-MW-705	2	22.51	180.00	170.50	12.56	167.44	12.89	167.11	12.89	167.11	--	--	--	--	--	--	--	--	--	--
SPD-MW-800	2	15.76	196.42	186.11	DRY	-	15.46	180.96	9	187.42	12.55	183.87	14.68	181.74	DRY	--	12.37	184.05	11.56	184.86
SPD-MW-801	2	21.86	190.06	179.00	14.27	175.79	14.34	175.72	9.48	180.58	12.94	177.12	13.65	176.41	14.63	175.43	12.20	177.86	12.08	177.98
SPD-MW-802	2	19.20	174.51	165.71	9.43	165.08	10.79	163.72	7.78	166.73	9.11	165.40	9.78	164.73	13.74	160.77	8.85	165.66	8.76	165.75
SPD-MW-803	2	18.06	139.41	132.20	10.4	129.01	10.51	128.90	-	-	--	--	--	--	--	--	--	--	--	--
SPD-MW-804	2	22.11	183.14	163.33	21.64	161.50	22	161.14	18.35	164.79	20.80	162.34	21.36	161.78	DRY	-	21.15	161.99	20.28	162.86
SPD-IW-3	2	15.80	167.31	156.81	14.31	153.00	14.28	153.03	-	-	--	--	--	--	--	--	--	--	--	--
SPD-IW-9	2	16.00	169.40	161.78	11.96	157.44	11.57	157.83	-	-	--	--	--	--	--	--	--	--	--	--
SPD-IW-11	2	17.31	170.21	164.97	9.58	160.63	9.72	160.49	-	-	--	--	--	--	--	--	--	--	--	--
SPD-IW-14	2	16.21	168.82	158.23	14.55	154.27	14.56	154.26	-	-	--	--	--	--	--	--	--	--	--	--
SPD-IW-17	2	13.20	172.52	164.94	11.40	161.12	11.46	161.06	-	-	--	--	--	--	--	--	--	--	--	--
SPD-IW-32	2	17.09	169.67	157.86	14.60	155.07	14.26	155.41	9.86	159.81	13.35	156.32	14.21	155.46	14.50	155.17	12.52	157.15	12.30	157.37
SPD-IW-101	2	18.94	174.91	158.38	DRY	-	destroyed	-	destroyed	-	--	--	--	--	DRY	-	17.80	157.11	15.90	159.01
SPD-IW-104	2	20.64	168.85	152.61	17.20	151.65	destroyed	-	destroyed	-	--	--	15.51	153.34	16.44	152.41	15.24	153.61	14.95	153.90
F6[1]	1	17.90											14.13		16.19		10.66		9.85	
G6[1]	1	20.06															10.34		9.50	
H6[1]	2																		11.13	
H7[1]	2																		13.32	
GH56[1]	2																		10.74	
E6D[1]	2																		9.91	
F6D[1]	2																		10.57	
Clay Containment Area																				
CC-MW-105	1	19.38	183.72	173.48	13.75	169.97	13.99	169.73	13.99	169.73	--		--		--		--		--	

Notes: Elevations in feet above mean sea level (amsl).
Well depth measured from top of PVC.
DCAMM = Division of Capital Asset Management & Maintenance.
PP-MW-1, PP-MW-5, PP-MW-6 and PP-MW-7 were not able to be located.
"*" = Groundwater elevations are based on gauging data collected on 5/31/2011 and 7/13/2011.
"-" = Not Measured
1. Survey data is currently unavailable for groundwater monitoring wells installed during the 2019 and 2020 delineation program.

Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-2 Area							GW-2 Area					GW-2 Area						
					SPD-IW-32							SPD-IW-101					SPD-IW-104						
		GW-1	GW-2	GW-3	5/29/2019	8/29/2019	11/19/2019	2/21/2020	5/21/2020	8/21/2020	11/16/2020	11/19/2019	2/21/2020	5/22/2020	8/21/2020	11/16/2020	8/29/2019	11/19/2019	2/21/2020	2/21/2020 DUP-1	5/22/2020	8/21/2020	11/17/2020
Metals																							
Sodium	mg/l	~	~	~	**37**	**40**	**42**	**40**	NA	DRY	DRY	DRY	**52**	NA	DRY	DRY	**51**	**52**	**51**	**51**	NA	NA	NA
Hardness	mg/l	~	~	~	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
CAM 14 Metals																							
Antimony	µg/L	6	~	8000	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Arsenic	µg/L	10	~	900	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Barium	µg/L	2000	~	50000	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Beryllium	µg/L	4	~	200	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Cadmium	µg/L	5	~	4	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Chromium (Total)	µg/L	100	~	300	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Lead	µg/L	15	~	10	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/L	0.002	~	0.02	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Nickel	µg/L	100	~	200	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Thallium	µg/L	2	~	3000	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Vanadium	µg/L	30	~	4000	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Zinc	µg/L	5000	~	900	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Solids																							
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Alkalinity	mg/l	~	~	~	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Organics																							
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry																							
Sulfate	mg/l	~	~	~	**33**	**31**	**23**	**40**	NA	DRY	DRY	DRY	**30**	NA	DRY	DRY	**31**	**30**	**28**	**29**	NA	NA	NA
Nitrate	~	~	~	~	NA	NA	NA	NA	NA	DRY	DRY	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
VOC 8260**																							
Acetone	µg/L	6300	50000	50000	<10	<10	<10	<10	<10	DRY	DRY	DRY	**11**	<20	DRY	DRY	<10	<20	<10	<10	<10	<20	<10
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<0.50	<0.50	<0.50	<0.50	<0.50	DRY	DRY	DRY	< 0.50	<1.0	DRY	DRY	<0.50	<1.0	<0.5	<0.5	<0.50	<1.0	<0.50
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	DRY	DRY	< 1.0	<2.0	DRY	DRY	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0
Bromomethane	µg/L	10	7	800	<2.0	<5.0	<5.0	<5.0	<2.0	DRY	DRY	DRY	< 2.0	<4.0	DRY	DRY	<2.0	<10	<2.0	<2.0	<2.0	<4.0	<5.0
2-Butanone MEK	µg/L	4000	50000	50000	<10	<10.0	<10	<10	<10	DRY	DRY	DRY	< 10	<20	DRY	DRY	<10	<20	<10	<10	<10	<20	<10
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	DRY	DRY	< 1.0	<2.0	DRY	DRY	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	<0.50	<0.50	<0.50	DRY	DRY	DRY	< 0.50	<1.0	DRY	DRY	<0.50	<1.0	<0.50	<0.50	<0.50	<1.0	<0.50
Chloroethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	DRY	DRY	< 2.0	<4.0	DRY	DRY	<2.0	<4.0	<2.0	<2.0	<2.0	<4.0	<2.0
Chloromethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	DRY	DRY	< 2.0	<4.0	DRY	DRY	<2.0	<4.0	<2.0	<2.0	<2.0	<4.0	<2.0
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	DRY	DRY	< 1.0	<2.0	DRY	DRY	<1.0	<2.0	<1.0	<1.0	< 1.0	<2.0	< 1.0
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	DRY	DRY	< 1.0	<2.0	DRY	DRY	**1.2**	<2.0	<1.0	<1.0	**1.6**	<2.0	**1.8**
Naphthalene	µg/L	140	700	20000	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	DRY	DRY	< 2.0	<4.0	DRY	DRY	<2.0	<4.0	<2.0	<2.0	< 2.0	<4.0	< 2.0
Tetrachloroethylene	µg/L	5	50	30000	**100**	**110**	**110**	**190**	**150**	DRY	DRY	DRY	**85**	**140**	DRY	DRY	**110**	**62**	**75**	**77**	**120**	**130**	**43**
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	DRY	DRY	< 2.0	<4.0	DRY	DRY	<2.0	<4.0	<2.0	<2.0	<2.0	<4.0	<2.0
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	DRY	DRY	< 1.0	<2.0	DRY	DRY	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<1.0
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	DRY	DRY	< 1.0	<2.0	DRY	DRY	<1.0	<2.0	<1.0	<1.0	< 1.0	<2.0	< 1.0
Vinyl Chloride	µg/L	2	2	50000	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	DRY	DRY	< 2.0	<4.0*	DRY	DRY	<2.0	<4.0	<2.0	<2.0	< 2.0	<4.0 *	< 2.0

QC by RM-H 12.15.20

Abbreviations:

CAM = Compendium of Analytical Methods
VOC = Volatile Organic Compound
SVOC = Semi Volatile Organic Compounds
ug/L = microgram per liter
mg/L = milligrams per liter
~ = No Standard
NA = Not Analyzed
< = parameters not detected above laboratory method detection limit shown.

BOLD Exceeds lab method detection limit.
BOLD Exceeds applicable MCP standards.

Notes:

- Analytical results compared to the Massachusetts Contingency Plan (MCP) Method 1 Cleanup Standards 310 CMR 40.0000, revised January 2015.
*- wells are compared to GW-1 or GW-2, as noted in the header. All wells compared to GW-3
- An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
**Compounds not shown have no exceedances of the MCP Method 1 Criteria and/or laboratory method detection limit
Samples collected prior to 2019 are provided in previous Phase IV Status Reports.
Sodium and sulfate were removed from the sampling plan in May 2020 as parameters were within 10% of the baseline

Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-2 Area		GW-2 Area											GW-1 Area						
					SPD-MW-401D		SPD-MW-401S											SPD-MW-402						
		GW-1	GW-2	GW-3	8/28/2019	11/19/2019	5/28/2019	8/29/2019	11/19/2019 DUP-1	11/19/2019	2/21/2020	5/21/2020	5/21/2020 DUP-1	8/21/2020	8/21/2020 DUP-1	11/18/2020	11/18/2020 DUP-1	5/30/2019	8/29/2019	11/20/2019	2/18/2020	5/22/2020	8/21/2020	11/16/2020
Metals																								
Sodium	mg/l	~	~	~	NA	NA	**29**	**36**	**49**	**50**	**29**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hardness	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	**41**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAM 14 Metals																								
Antimony	µg/L	6	~	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	µg/L	10	~	900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	µg/L	2000	~	50000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	µg/L	4	~	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	µg/L	5	~	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (Total)	µg/L	100	~	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	µg/L	15	~	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/L	0.002	~	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	µg/L	100	~	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	µg/L	2	~	3000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	µg/L	30	~	4000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	µg/L	5000	~	900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Solids																								
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	**160**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	**59**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organics																								
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	**1.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry																								
Sulfate	mg/l	~	~	~	NA	NA	**21**	**20**	**18**	**18**	**18**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate		~	~	~	NA	NA	NA	NA	NA	NA	**1.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOC 8260**																								
Acetone	µg/L	6300	50000	50000	<10	<10	<20	<50	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<1.0	<0.50	<1.0	<2.5	<0.50	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<0.50	<0.50
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	<2.0	<5.0 *	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	µg/L	10	7	800	<2.0	<5.0	<10	<25 *	<5.0	<10	<10	<4.0	<4.0	<5.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<5.0
2-Butanone MEK	µg/L	4000	50000	50000	<10	<10	<20	<50	<10	<20	<20	<20	<20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	<2.0	<5.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	<1.0	<2.5 *	<0.50	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane	µg/L	~	~	~	<2.0	<2.0	<4.0	<10	<2.0	<4.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloromethane	µg/L	~	~	~	<2.0	<2.0	<4.0	<10	<2.0	<4.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	<2.0	<5.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	< 1.0	< 1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1.0
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	<2.0	<5.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	**2.4**	**3.6**	<1.0	**1.3**	**5.2**	**4.1**
Naphthalene	µg/L	140	700	20000	<5.0	<2.0	<4.0	<10	<2.0	<4.0	<4.0	<4.0	<4.0	<2.0	<2.0	< 2.0	< 2.0	<2.0	<2.0	<5.0	<5.0	<2.0	<2.0	< 2.0
Tetrachloroethylene	µg/L	5	50	30000	<1.0	<1.0	**210**	**130**	**130**	**130**	**460**	**190**	**190**	**51**	**51**	**27**	**27**	**62**	**58**	**39**	**31**	**27**	**47**	**26**
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	<4.0	<10	<2.0	<4.0	<4.0	<4.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	<2.0	<5.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	<2.0	<5.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	< 1.0	< 1.0	**1.5**	**3.6**	**5.2**	**1.7**	**4.0**	**5.4**	**5.3**
Vinyl Chloride	µg/L	2	2	50000	<2.0	<2.0	< 2.0	<10 *	<2.0	<4.0	<4.0	<4.0*	<4.0*	<2.0	<2.0	< 2.0	< 2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 2.0

QC by RM-H 12.15.20

Abbreviations:

CAM = Compendium of Analytical Methods
VOC = Volatile Organic Compound
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ug/L = microgram per liter
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BOLD Exceeds lab method detection limit.
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Notes:

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*- wells are compared to GW-1 or GW-2, as noted in the header. All wells compared to GW-3
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**Compounds not shown have no exceedances of the MCP Method 1 Criteria and/or laboratory method detection limit
Samples collected prior to 2019 are provided in previous Phase IV Status Reports.
Sodium and sulfate were removed from the sampling plan in May 2020 as parameters were within 10% of the baseline

Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-2 Area								GW-2 Area						
					SPD-MW-500								SPD-MW-501						
		GW-1	GW-2	GW-3	5/29/2019	8/29/2019	8/29/2019 (DUP-1)	11/20/2019	2/21/2020	5/21/2020	8/21/2020	11/18/2020	5/29/2019	8/29/2019	11/20/2019	2/21/2020	5/21/2020	8/21/2020	11/16/2020
Metals																			
Sodium	mg/l	~	~	~	**20**	**24**	**24**	**30**	**23**	NA	DRY	NA	**37**	**38**	**48**	**31**	NA	NA	DRY
Hardness	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
CAM 14 Metals																			
Antimony	µg/L	6	~	8000	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Arsenic	µg/L	10	~	900	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Barium	µg/L	2000	~	50000	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Beryllium	µg/L	4	~	200	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Cadmium	µg/L	5	~	4	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Chromium (Total)	µg/L	100	~	300	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Lead	µg/L	15	~	10	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Mercury	mg/L	0.002	~	0.02	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Nickel	µg/L	100	~	200	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Thallium	µg/L	2	~	3000	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Vanadium	µg/L	30	~	4000	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Zinc	µg/L	5000	~	900	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Solids																			
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Alkalinity	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Organics																			
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
Wet Chemistry																			
Sulfate	mg/l	~	~	~	**15**	**17**	**17**	**17**	**14**	NA	DRY	NA	**21**	**18**	**5.9**	**22**	NA	NA	DRY
Nitrate		~	~	~	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY
VOC 8260**																			
Acetone	µg/L	6300	50000	50000	<10	<10	<10	<10	<10	<10	DRY	<10	<10	<10	<10	<10	<20	<20	DRY
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	DRY	<0.50	<0.50	<0.50	<1.0	<0.50	<1.0	<1.0	DRY
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	DRY
Bromomethane	µg/L	10	7	800	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<5.0	<2.0	<2.0	<2.0	<2.0	<4.0	<4.0	DRY
2-Butanone MEK	µg/L	4000	50000	50000	<10	<10	<10	<10	<10	<10	DRY	<10	<10	<10	<10	<10	<20	<20	DRY
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	DRY
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	DRY	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	DRY
Chloroethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<4.0	DRY
Chloromethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<4.0	DRY
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	DRY
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	DRY
Naphthalene	µg/L	140	700	20000	<2.0	**2.7**	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<5.0	<5.0	<4.0	<4.0	DRY
Tetrachloroethylene	µg/L	5	50	30000	**5.6**	**3.9**	**3.3**	**25**	**9.7**	**47**	DRY	**18**	**170**	**45**	**35**	**120**	**99**	**95**	DRY
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<4.0	DRY
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	DRY
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	DRY
Vinyl Chloride	µg/L	2	2	50000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0*	<4.0 *	DRY
SVOC 8270																			
Benzo(a)pyrene (low)	µg/L	0.2	~	500	NA	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	DRY

QC by RM-H 12.15.20

Abbreviations:
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BOLD Exceeds lab method detection limit.
BOLD Exceeds applicable MCP standards.

Notes:
- Analytical results compared to the Massachusetts Contingency Plan (MCP) Method 1 Cleanup Standards 310 CMR 40.0000, revised January 2015.
*- wells are compared to GW-1 or GW-2, as noted in the header. All wells compared to GW-3
- An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
**Compounds not shown have no exceedances of the MCP Method 1 Criteria and/or laboratory method detection limit
Samples collected prior to 2019 are provided in previous Phase IV Status Reports.
Sodium and sulfate were removed from the sampling plan in May 2020 as parameters were within 10% of the baseline

Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-2 Area							GW-1 Area						
					SPD-MW-502							SPD-MW-504R						
		GW-1	GW-2	GW-3	5/29/2019	8/29/2019	11/21/2019	2/19/2020	5/22/2020	8/21/2020	11/16/2020	5/29/2019	8/29/2019	11/20/2019	2/21/2020	5/22/2020	8/21/2020	11/17/2020
Metals																		
Sodium	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hardness	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAM 14 Metals																		
Antimony	µg/L	6	~	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	µg/L	10	~	900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	µg/L	2000	~	50000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	µg/L	4	~	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	µg/L	5	~	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (Total)	µg/L	100	~	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	µg/L	15	~	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/L	0.002	~	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	µg/L	100	~	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	µg/L	2	~	3000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	µg/L	30	~	4000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	µg/L	5000	~	900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Solids																		
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organics																		
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry																		
Sulfate	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate		~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOC 8260**																		
Acetone	µg/L	6300	50000	50000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<0.50	<0.50	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	µg/L	10	7	800	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<5.0
2-Butanone MEK	µg/L	4000	50000	50000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloromethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	µg/L	140	700	20000	<2.0	<2.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethylene	µg/L	5	50	30000	**32**	**9.0**	**8.2**	**8.2**	**15**	**9.1**	**7.1**	**3.8**	**3.3**	**5.4**	**3.9**	**3.3**	**3.4**	**4.3**
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	µg/L	2	2	50000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
SVOC 8270																		
Benzo(a)pyrene (low)	µg/L	0.2	~	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

QC by RM-H 12.15.20

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Samples collected prior to 2019 are provided in previous Phase IV Status Reports.
Sodium and sulfate were removed from the sampling plan in May 2020 as parameters were within 10% of the baseline

Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-1 Area							GW-2 Area							
					SPD-MW-505							SPD-MW-600							
		GW-1	GW-2	GW-3	5/30/2019	8/29/2019	11/21/2019	2/18/2020	5/22/2020	8/20/2020	11/17/2020	5/29/2019	5/29/2019 (Dup-1)	8/28/2019	11/19/2019	2/19/2020	5/21/2020	8/21/2020	11/18/2020
Metals																			
Sodium	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	**35**	**35**	**28**	**28**	**38**	NA	DRY	NA
Hardness	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**32**	NA	DRY	NA
CAM 14 Metals																			
Antimony	µg/L	6	~	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Arsenic	µg/L	10	~	900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Barium	µg/L	2000	~	50000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Beryllium	µg/L	4	~	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Cadmium	µg/L	5	~	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Chromium (Total)	µg/L	100	~	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Lead	µg/L	15	~	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Mercury	mg/L	0.002	~	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Nickel	µg/L	100	~	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Thallium	µg/L	2	~	3000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Vanadium	µg/L	30	~	4000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Zinc	µg/L	5000	~	900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Solids																			
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**150**	NA	DRY	NA
Alkalinity	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**55**	NA	DRY	NA
Organics																			
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0	NA	DRY	NA
Wet Chemistry																			
Sulfate	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	**26**	**24**	**14**	**15**	**24**	NA	DRY	NA
Nitrate		~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.5**	NA	DRY	NA
VOC 8260**																			
Acetone	µg/L	6300	50000	50000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	DRY	<10
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<0.50	<0.50	<1.0	<1.0	<.50	<0.50	<0.50	<5.0	<5.0	<1.0	<1.0	<1.0	<0.50	DRY	<0.50
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
Bromomethane	µg/L	10	7	800	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<5.0
2-Butanone MEK	µg/L	4000	50000	50000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	DRY	<10
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	DRY	<0.50
Chloroethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0
Chloromethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	3.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
Naphthalene	µg/L	140	700	20000	<2.0	<2.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	DRY	<2.0
Tetrachloroethylene	µg/L	5	50	30000	<1.0	**5.2**	**36**	<1.0	<1.0	**1.9**	**2.3**	**640**	**710**	**75**	**62**	**71**	**690**	DRY	**290**
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	<1.0	<1.0	<1.0	**6.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	**5.5**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
Vinyl Chloride	µg/L	2	2	50000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0
SVOC 8270																			
Benzo(a)pyrene (low)	µg/L	0.2	~	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA

QC by RM-H 12.15.20

Abbreviations:

CAM = Compendium of Analytical Methods
VOC = Volatile Organic Compound
SVOC = Semi Volatile Organic Compounds
ug/L = microgram per liter
mg/L = milligrams per liter
~ = No Standard
NA = Not Analyzed
< = parameters not detected above laboratory method detection limit shown.

BOLD Exceeds lab method detection limit.
BOLD Exceeds applicable MCP standards.

Notes:

- Analytical results compared to the Massachusetts Contingency Plan (MCP) Method 1 Cleanup Standards 310 CMR 40.0000, revised January 2015.
*- wells are compared to GW-1 or GW-2, as noted in the header. All wells compared to GW-3
- An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
**Compounds not shown have no exceedances of the MCP Method 1 Criteria and/or laboratory method detection limit
Samples collected prior to 2019 are provided in previous Phase IV Status Reports.
Sodium and sulfate were removed from the sampling plan in May 2020 as parameters were within 10% of the baseline

Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-2 Area							GW-2 Area						
					SPD-MW-601							SPD-MW-602						
		GW-1	GW-2	GW-3	5/29/2019	8/28/2019	11/18/2019	2/21/2020	5/21/2020	8/21/2020	11/18/2020	5/30/2019	8/28/2019	11/19/2019	2/21/2020	5/20/2020	8/21/2020	11/17/2020
Metals																		
Sodium	mg/l	~	~	~	NA	**36**	**33**	**31**	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Hardness	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**18**	NA	DRY	NA
CAM 14 Metals																		
Antimony	µg/L	6	~	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Arsenic	µg/L	10	~	900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Barium	µg/L	2000	~	50000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Beryllium	µg/L	4	~	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Cadmium	µg/L	5	~	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Chromium (Total)	µg/L	100	~	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Lead	µg/L	15	~	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Mercury	mg/L	0.002	~	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Nickel	µg/L	100	~	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Thallium	µg/L	2	~	3000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Vanadium	µg/L	30	~	4000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Zinc	µg/L	5000	~	900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA
Solids																		
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**110**	NA	DRY	NA
Alkalinity	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**39**	NA	DRY	NA
Organics																		
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0	NA	DRY	NA
Wet Chemistry																		
Sulfate	mg/l	~	~	~	**19**	**17**	**17**	**20**	NA	NA	NA	NA	NA	NA	**7.9**	NA	DRY	NA
Nitrate		~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.61**	NA	DRY	NA
VOC 8260**																		
Acetone	µg/L	6300	50000	50000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	DRY	<10
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<0.50	DRY	<0.50
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
Bromomethane	µg/L	10	7	800	<2.0	<2.0	<5.0	<5.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<5.0
2-Butanone MEK	µg/L	4000	50000	50000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	DRY	<10
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	DRY	<0.50
Chloroethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0
Chloromethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
Naphthalene	µg/L	140	700	20000	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	DRY	<2.0
Tetrachloroethylene	µg/L	5	50	30000	**6.8**	**4.6**	**8.2**	**16**	**6.9**	**33**	**6.2**	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0
Vinyl Chloride	µg/L	2	2	50000	< 2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0
SVOC 8270																		
Benzo(a)pyrene (low)	µg/L	0.2	~	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	DRY	NA

QC by RM-H 12.15.20

Abbreviations:

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SVOC = Semi Volatile Organic Compounds
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- An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
**Compounds not shown have no exceedances of the MCP Method 1 Criteria and/or laboratory method detection limit
Samples collected prior to 2019 are provided in previous Phase IV Status Reports.
Sodium and sulfate were removed from the sampling plan in May 2020 as parameters were within 10% of the baseline

Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-2 Area						GW-2 Area							GW-2 Area						
					SPD-MW-603						SPD-MW-700							SPD-MW-704						
		GW-1	GW-2	GW-3	8/28/2019	11/19/2019	2/21/2020	5/21/2020	8/21/2020	11/16/2020	5/30/2019	8/29/2019	11/19/2019	2/21/2020	5/21/2020	8/21/2020	11/18/2020	5/29/2019	8/28/2019	11/19/2019	2/21/2020	5/22/2020	8/21/2020	11/16/2020
Metals																								
Sodium	mg/l	~	~	~	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Hardness	mg/l	~	~	~	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
CAM 14 Metals																								
Antimony	µg/L	6	~	8000	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	µg/L	10	~	900	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Barium	µg/L	2000	~	50000	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	µg/L	4	~	200	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	µg/L	5	~	4	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (Total)	µg/L	100	~	300	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Lead	µg/L	15	~	10	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/L	0.002	~	0.02	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	µg/L	100	~	200	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	µg/L	2	~	3000	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	µg/L	30	~	4000	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	µg/L	5000	~	900	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Solids																								
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity	mg/l	~	~	~	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Organics																								
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry																								
Sulfate	mg/l	~	~	~	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate		~	~	~	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA
VOC 8260**																								
Acetone	µg/L	6300	50000	50000	<10	<10	<10	<10	DRY	DRY	<10	<10	<10	<10	<10	DRY	<10	<10	<10	<10	<10	<10	<10	<10
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<1.0	<0.50	<0.50	<0.50	DRY	DRY	<0.50	<0.50	<0.50	<0.50	<2.0	DRY	<0.50	<0.50	<1.0	<0.50	<0.50	<2.0	<0.50	<0.50
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	µg/L	10	7	800	<2.0	<5.0	<5.0	<2.0	DRY	DRY	<2.0	<5.0	<5.0	<5.0	<5.0	DRY	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0
2-Butanone MEK	µg/L	4000	50000	50000	<10	<10	<10	<10	DRY	DRY	<10	<10	<10	<10	<10	DRY	<10	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	<0.50	<0.50	DRY	DRY	<0.50	<0.50	<0.50	<0.50	<0.50	DRY	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloromethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	µg/L	140	700	20000	<5.0	<2.0	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethylene	µg/L	5	50	30000	<1.0	**1.8**	<1.0	<1.0	DRY	DRY	<1.0	<1.0	**3.3**	<1.0	<1.0	DRY	**12**	**66**	**56**	**35**	**34**	**52**	**66**	**31**
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	µg/L	2	2	50000	<2.0	<2.0	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
SVOC 8270																								
Benzo(a)pyrene (low)	µg/L	0.2	~	500	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	

QC by RM-H 12.15.20

Abbreviations:

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BOLD Exceeds lab method detection limit.
BOLD Exceeds applicable MCP standards.

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*- wells are compared to GW-1 or GW-2, as noted in the header. All wells compared to GW-3
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**Compounds not shown have no exceedances of the MCP Method 1 Criteria and/or laboratory method detection limit
Samples collected prior to 2019 are provided in previous Phase IV Status Reports.
Sodium and sulfate were removed from the sampling plan in May 2020 as parameters were within 10% of the baseline

Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-2 Area							GW-2 Area						
					SPD-MW-800							SPD-MW-801						
		GW-1	GW-2	GW-3	5/30/2019	8/29/2019	11/19/2019	2/19/2020	5/21/2020	8/21/2020	11/16/2020	5/29/2019	8/28/2019	11/19/2019	2/21/2020	5/21/2020	8/21/2020	11/18/2020
Metals																		
Sodium	mg/l	~	~	~	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Hardness	mg/l	~	~	~	NA	NA	NA	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
CAM 14 Metals																		
Antimony	µg/L	6	~	8000	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Arsenic	µg/L	10	~	900	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Barium	µg/L	2000	~	50000	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Beryllium	µg/L	4	~	200	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Cadmium	µg/L	5	~	4	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Chromium (Total)	µg/L	100	~	300	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Lead	µg/L	15	~	10	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/L	0.002	~	0.02	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Nickel	µg/L	100	~	200	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Thallium	µg/L	2	~	3000	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Vanadium	µg/L	30	~	4000	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Zinc	µg/L	5000	~	900	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Solids																		
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Alkalinity	mg/l	~	~	~	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Organics																		
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry																		
Sulfate	mg/l	~	~	~	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
Nitrate	mg/l	~	~	~	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA
VOC 8260**																		
Acetone	µg/L	6300	50000	50000	<10	<10	DRY	<10	<10	DRY	DRY	<10	<10	<10	<10	<10	<10	<10
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<0.50	<0.50	DRY	<1.0	<0.50	DRY	DRY	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	µg/L	10	7	800	<2.0	<5.0	DRY	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0
2-Butanone MEK	µg/L	4000	50000	50000	<10	<10	DRY	<10	<10	DRY	DRY	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	DRY	<0.50	<0.50	DRY	DRY	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane	µg/L	~	~	~	<2.0	<2.0	DRY	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloromethane	µg/L	~	~	~	<2.0	<2.0	DRY	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	µg/L	140	700	20000	<2.0	<2.0	DRY	<2.0	<2.0	DRY	DRY	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethylene	µg/L	5	50	30000	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY	**5.3**	**4.7**	**4.0**	**4.4**	**4.1**	**5.5**	**3.3**
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	DRY	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	µg/L	2	2	50000	<2.0	<2.0	DRY	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
SVOC 8270																		
Benzo(a)pyrene (low)	µg/L	0.2	~	500	NA	NA	DRY	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA

QC by RM-H 12.15.20

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**Compounds not shown have no exceedances of the MCP Method 1 Criteria and/or laboratory method detection limit
Samples collected prior to 2019 are provided in previous Phase IV Status Reports.
Sodium and sulfate were removed from the sampling plan in May 2020 as parameters were within 10% of the baseline

Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-2 Area							GW-2 Area						
					SPD-MW-802							SPD-MW-804						
		GW-1	GW-2	GW-3	5/29/2019	8/29/2019	11/21/2019	2/19/2020	5/21/2020	8/20/2020	11/16/2020	5/30/2019	8/29/2019	11/19/2019	2/21/2020	5/22/2020	8/21/2020	11/16/2020
Metals																		
Sodium	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Hardness	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
CAM 14 Metals																		
Antimony	µg/L	6	~	8000	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Arsenic	µg/L	10	~	900	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Barium	µg/L	2000	~	50000	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Beryllium	µg/L	4	~	200	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Cadmium	µg/L	5	~	4	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Chromium (Total)	µg/L	100	~	300	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Lead	µg/L	15	~	10	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Mercury	mg/L	0.002	~	0.02	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Nickel	µg/L	100	~	200	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Thallium	µg/L	2	~	3000	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Vanadium	µg/L	30	~	4000	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Zinc	µg/L	5000	~	900	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Solids																		
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Alkalinity	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Organics																		
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Wet Chemistry																		
Sulfate	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
Nitrate	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY
VOC 8260**																		
Acetone	µg/L	6300	50000	50000	<10	<10	<10	<10	<10	<10	DRY	<10	<10	DRY	<10	<10	DRY	DRY
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<0.50	<0.50	<1.0	<1.0	<0.50	<0.50	DRY	<0.50	<0.50	DRY	<0.50	<0.50	DRY	DRY
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY
Bromomethane	µg/L	10	7	800	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<5.0	DRY	<2.0	<2.0	DRY	DRY
2-Butanone MEK	µg/L	4000	50000	50000	<10	<10	<10	<10	<10	<10	DRY	<10	<10	DRY	<10	<10	DRY	DRY
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	DRY	<0.50	<0.50	DRY	<0.50	<0.50	DRY	DRY
Chloroethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	DRY	<2.0	<2.0	DRY	DRY
Chloromethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	DRY	<2.0	<2.0	DRY	DRY
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY
Naphthalene	µg/L	140	700	20000	<2.0	<2.0	<5.0	<5.0	<2.0	<2.0	DRY	<2.0	<2.0	DRY	<2.0	<2.0	DRY	DRY
Tetrachloroethylene	µg/L	5	50	30000	**2.5**	**2.2**	**3.5**	**3.9**	**2.9**	**2.6**	DRY	<1.0	<1.0	DRY	<1.0	**2.0**	DRY	DRY
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	DRY	<2.0	<2.0	DRY	DRY
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	DRY	<1.0	<1.0	DRY	<1.0	<1.0	DRY	DRY
Vinyl Chloride	µg/L	2	2	50000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	DRY	<2.0	<2.0	DRY	<2.0	<2.0	DRY	DRY
SVOC 8270																		
Benzo(a)pyrene (low)	µg/L	0.2	~	500	NA	NA	NA	NA	NA	NA	DRY	NA	NA	DRY	NA	NA	DRY	DRY

QC by RM-H 12.15.20

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Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-2 Area						GW-2 Area				GW-2 Area			
					F6						G6				H6			
		GW-1	GW-2	GW-3	8/29/2019	11/20/2019	2/19/2020	5/20/2020	8/21/2020	11/16/2020	2/19/2020	5/20/2020	8/21/2020	11/17/2020	3/10/2020	5/20/2020	8/21/2020	11/16/2020
Metals																		
Sodium	mg/l	~	~	~	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Hardness	mg/l	~	~	~	NA	NA	**58**	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
CAM 14 Metals																		
Antimony	µg/L	6	~	8000	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Arsenic	µg/L	10	~	900	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Barium	µg/L	2000	~	50000	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Beryllium	µg/L	4	~	200	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Cadmium	µg/L	5	~	4	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Chromium (Total)	µg/L	100	~	300	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Lead	µg/L	15	~	10	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Mercury	mg/L	0.002	~	0.02	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Nickel	µg/L	100	~	200	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Thallium	µg/L	2	~	3000	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Vanadium	µg/L	30	~	4000	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Zinc	µg/L	5000	~	900	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Solids																		
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	**170**	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Alkalinity	mg/l	~	~	~	NA	NA	**70**	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Organics																		
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	**1.7**	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Wet Chemistry																		
Sulfate	mg/l	~	~	~	NA	NA	**20**	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
Nitrate	mg/l	~	~	~	NA	NA	**1.4**	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY
VOC 8260**																		
Acetone	µg/L	6300	50000	50000	<400	<10	<500	<1000	DRY	DRY	<50	<10	DRY	<20	<10	<10	DRY	DRY
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<20	<0.50	<50	<50	DRY	DRY	<5.0	<0.50	DRY	<1.0	<0.50	<0.50	DRY	DRY
Bromodichloromethane	µg/L	3	6	50000	<40 *	<1.0	<50	<100*	DRY	DRY	<5.0	<1.0	DRY	<2.0	<1.0	<1.0	DRY	DRY
Bromomethane	µg/L	10	7	800	<80 *	<2.0	<50	<200*	DRY	DRY	<10	<2.0	DRY	<10*	<2.0	<2.0	DRY	DRY
2-Butanone MEK	µg/L	4000	50000	50000	<400	<10	<500	<1000	DRY	DRY	<50	<10	DRY	<20	<10	<10	DRY	DRY
Chlorobenzene	µg/L	100	200	1000	<40	<1.0	<50	<100	DRY	DRY	<5.0	<1.0	DRY	<2.0	<1.0	<1.0	DRY	DRY
Chlorodibromomethane	µg/L	2	20	50000	<20 *	<0.50	<25	<50*	DRY	DRY	<2.5	<0.50	DRY	<1.0	<0.50	<0.50	DRY	DRY
Chloroethane	µg/L	~	~	~	<80	<2.0	<100	<200	DRY	DRY	<10	<2.0	DRY	<4.0	<2.0	<2.0	DRY	DRY
Chloromethane	µg/L	~	~	~	<80	<2.0	<100	<200	DRY	DRY	<10	<2.0	DRY	<4.0	<2.0	<2.0	DRY	DRY
1,2-Dichlorobenzene	µg/L	600	8000	2000	<40	<1.0	<50	<100	DRY	DRY	<5.0	<1.0	DRY	<2.0	<1.0	<1.0	DRY	DRY
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<40 *	<1.0	<50	<100*	DRY	DRY	<5.0	<1.0	DRY	**2.5**	<1.0	<1.0	DRY	DRY
Naphthalene	µg/L	140	700	20000	<2.0	<2.0	<250	<200*	DRY	DRY	<25	<2.0	DRY	<4.0	<2.0	<2.0	DRY	DRY
Tetrachloroethylene	µg/L	5	50	30000	**2500**	**3800**	**13000**	**7400**	DRY	DRY	**290**	**120**	DRY	**3600**	<1.0	<1.0	DRY	DRY
Tetrahydrofuran	µg/L	~	~	~	<80	<2.0	<100	<200	DRY	DRY	<10	<2.0	DRY	<4.0	<2.0	<2.0	DRY	DRY
Toluene	µg/L	1000	50000	40000	<40	<1.0	<50	<100	DRY	DRY	<5.0	<1.0	DRY	<2.0	<1.0	<1.0	DRY	DRY
Trichloroethylene	µg/L	5	5	5000	<40 *	**1.3**	<50	<100*	DRY	DRY	<1.0	<1.0	DRY	**3.2**	<1.0	<1.0	DRY	DRY
Vinyl Chloride	µg/L	2	2	50000	<80 *	<2.0	<100	<200*	DRY	DRY	<10	<2.0	DRY	<4.0*	<2.0	<2.0	DRY	DRY
SVOC 8270																		
Benzo(a)pyrene (low)	µg/L	0.2	~	500	NA	NA	NA	NA	DRY	DRY	NA	NA	DRY	NA	NA	NA	DRY	DRY

QC by RM-H 12.15.20

Abbreviations:

CAM = Compendium of Analytical Methods
VOC = Volatile Organic Compound
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ug/L = microgram per liter
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BOLD Exceeds lab method detection limit.
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Notes:

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- An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
**Compounds not shown have no exceedances of the MCP Method 1 Criteria and/or laboratory method detection limit
Samples collected prior to 2019 are provided in previous Phase IV Status Reports.
Sodium and sulfate were removed from the sampling plan in May 2020 as parameters were within 10% of the baseline

Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-2 Area				GW-2 Area					GW-2 Area				
					H7				F6D (Shallow)	F6D (Deep)	F6D			E6D (Shallow)	E6D (Deep)	E6D		
		GW-1	GW-2	GW-3	3/11/2020	5/21/2020	8/21/2020	11/16/2020	3/16/2020	3/16/2020	5/20/2020	8/21/2020	11/18/2020	3/16/2020	3/16/2020	5/20/2020	8/21/2020	11/18/2020
Metals																		
Sodium	mg/l	~	~	~	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hardness	mg/l	~	~	~	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAM 14 Metals																		
Antimony	µg/L	6	~	8000	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	µg/L	10	~	900	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	µg/L	2000	~	50000	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	µg/L	4	~	200	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	µg/L	5	~	4	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (Total)	µg/L	100	~	300	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	µg/L	15	~	10	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/L	0.002	~	0.02	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	µg/L	100	~	200	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	µg/L	2	~	3000	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	µg/L	30	~	4000	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	µg/L	5000	~	900	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Solids																		
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity	mg/l	~	~	~	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organics																		
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry																		
Sulfate	mg/l	~	~	~	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate	mg/l	~	~	~	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOC 8260**																		
Acetone	µg/L	6300	50000	50000	**130**	<10	DRY	DRY	**90**	**110**	<10	<10	<10	**90**	**77**	<10	<10	<10
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<0.50	<0.50	DRY	DRY	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	µg/L	10	7	800	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<5.0
2-Butanone MEK	µg/L	4000	50000	50000	**17**	<10	DRY	DRY	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	DRY	DRY	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane	µg/L	~	~	~	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloromethane	µg/L	~	~	~	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	µg/L	140	700	20000	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethylene	µg/L	5	50	30000	<1.0	**2.0**	DRY	DRY	**5.3**	**4.8**	**2.8**	**40**	**12**	**5.2**	**5**	**8.5**	<1.0	**2.8**
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	DRY	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	µg/L	2	2	50000	<2.0	<2.0	DRY	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
SVOC 8270																		
Benzo(a)pyrene (low)	µg/L	0.2	~	500	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

QC by RM-H 12.15.20

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Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-2 Area				GW-1 Area							GW-1 Area							
					GH56				CD-MW-500							CD-MW-501							
		GW-1	GW-2	GW-3	3/11/2020	5/20/2020	8/21/2020	11/18/2020	5/30/2019	8/28/2019	11/21/2019	2/18/2020	5/22/2020	8/20/2020	11/17/2020	5/30/2019	8/29/2019	8/29/2019 (DUP-2)	11/21/2019	2/18/2020	5/22/2020	8/20/2020	11/17/2020
Metals																							
Sodium	mg/l	~	~	~	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hardness	mg/l	~	~	~	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAM 14 Metals																							
Antimony	µg/L	6	~	8000	NA	NA	DRY	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.5**	**1.4**	**1.4**	**1**	<1.0	**1.2**	<1.0	<1.0
Arsenic	µg/L	10	~	900	NA	NA	DRY	NA	<0.80	**1.5**	<0.80	1.5	<0.80	**2.9**	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Barium	µg/L	2000	~	50000	NA	NA	DRY	NA	**38**	**35**	**36**	**27**	**28**	**36**	**160**	**45**	**63**	**62**	**61**	**53**	**49**	**47**	**39**
Beryllium	µg/L	4	~	200	NA	NA	DRY	NA	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Cadmium	µg/L	5	~	4	NA	NA	DRY	NA	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**2.9**	**3.2**	**3.2**	**3**	**2.8**	**2.5**	**2.5**	**1.9**
Chromium (Total)	µg/L	100	~	300	NA	NA	DRY	NA	<1.0	<1.0	<1.0	<1.0	<1.0	**1.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Lead	µg/L	15	~	10	NA	NA	DRY	NA	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**11**	**19**	**19**	**12**	**13**	**14**	**3.4**	**6.3**
Mercury	mg/L	0.002	~	0.02	NA	NA	DRY	NA	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	**0.00011**	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Nickel	µg/L	100	~	200	NA	NA	DRY	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**5.2**	**47**	**50**	**50**	**50**	**45**	**46**	**38**	**35**
Thallium	µg/L	2	~	3000	NA	NA	DRY	NA	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium	µg/L	30	~	4000	NA	NA	DRY	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Zinc	µg/L	5000	~	900	NA	NA	DRY	NA	<10	<10	<10	<10	<10	<10	<10	**3000**	**2700**	**2800**	**2800**	**2900**	**2400**	**2500**	**2200**
Solids																							
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity	mg/l	~	~	~	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organics																							
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry																							
Sulfate	mg/l	~	~	~	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate	mg/l	~	~	~	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOC 8260**																							
Acetone	µg/L	6300	50000	50000	<10	<10	DRY	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<0.50	<0.50	DRY	<0.50	<0.50	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<0.50	<0.50
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	µg/L	10	7	800	<2.0	<2.0	DRY	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0
2-Butanone MEK	µg/L	4000	50000	50000	<10	<10	DRY	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	DRY	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane	µg/L	~	~	~	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloromethane	µg/L	~	~	~	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	µg/L	140	700	20000	<2.0	<2.0	DRY	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<2.0
Tetrachloroethylene	µg/L	5	50	30000	<1.0	**1.1**	DRY	**6.8**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	DRY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	µg/L	2	2	50000	<2.0	<2.0	DRY	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
SVOC 8270																							
Benzo(a)pyrene (low)	µg/L	0.2	~	500	NA	NA	DRY	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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**Compounds not shown have no exceedances of the MCP Method 1 Criteria and/or laboratory method detection limit
Samples collected prior to 2019 are provided in previous Phase IV Status Reports.
Sodium and sulfate were removed from the sampling plan in May 2020 as parameters were within 10% of the baseline

Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-1 Area								GW-1 Area									
					CD-MW-502								CD-MW-503									
		GW-1	GW-2	GW-3	5/30/2019	8/29/2019	11/21/2019	2/18/2020	5/22/2020	5/22/2020 DUP-2	8/20/2020	11/17/2020	5/30/2019	5/30/2019 (Dup-2)	8/29/2019	11/21/2019	2/18/2020	2/18/2020 DUP-2	5/22/2020	8/20/2020	8/20/2020 DUP-2	11/17/2020	11/17/2020 DUP-2
Metals																						
Sodium	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hardness	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAM 14 Metals																						
Antimony	µg/L	6	~	8000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	µg/L	10	~	900	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	**0.85**	**0.89**	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Barium	µg/L	2000	~	50000	**27**	**36**	**75**	**55**	**44**	**43**	**110**	**110**	**150**	**150**	**130**	**150**	**140**	**140**	**100**	**160**	**160**	**160**	**160**
Beryllium	µg/L	4	~	200	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Cadmium	µg/L	5	~	4	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.24**	<0.20	<0.20	<0.20	<0.20
Chromium (Total)	µg/L	100	~	300	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.0**	**1.0**
Lead	µg/L	15	~	10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**2.4**	**1.7**	**2.6**	**1.2**	**0.67**	**0.68**	**0.69**	<0.50	<0.50	<0.50	<0.50
Mercury	mg/L	0.002	~	0.02	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Nickel	µg/L	100	~	200	**18**	**21**	**16**	**15**	**14**	**14**	**9.4**	**8.0**	**6.5**	**5.9**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Thallium	µg/L	2	~	3000	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium	µg/L	30	~	4000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Zinc	µg/L	5000	~	900	**16**	**19**	**18**	**13**	<10	<10	**11**	<10	**88**	**88**	**33**	<10	**96**	**97**	**300**	**12**	<10	**18**	**18**
Solids																							
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organics																							
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry																							
Sulfate	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOC 8260**																							
Acetone	µg/L	6300	50000	50000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	µg/L	10	7	800	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0
2-Butanone MEK	µg/L	4000	50000	50000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloromethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	**1.1**	**1.1**	**1.2**	**1.4**	**1.4**
Naphthalene	µg/L	140	700	20000	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethylene	µg/L	5	50	30000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.3**	**1.4**	**1.3**	**1.1**	<1.0	<1.0	<1.0	<1.0	<1.0	**1.2**	**1.0**
Vinyl Chloride	µg/L	2	2	50000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
SVOC 8270																							
Benzo(a)pyrene (low)	µg/L	0.2	~	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

QC by RM-H 12.15.20

Abbreviations:
CAM = Compendium of Analytical Methods
VOC = Volatile Organic Compound
SVOC = Semi Volatile Organic Compounds
ug/L = microgram per liter
mg/L = milligrams per liter
~ = No Standard
NA = Not Analyzed
< = parameters not detected above laboratory method detection limit shown.

BOLD Exceeds lab method detection limit.
BOLD Exceeds applicable MCP standards.

Notes:
- Analytical results compared to the Massachusetts Contingency Plan (MCP) Method 1 Cleanup Standards 310 CMR 40.0000, revised January 2015.
*- wells are compared to GW-1 or GW-2, as noted in the header. All wells are compared to GW-3
- An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
**Compounds not shown have no exceedances of the MCP Method 1 Criteria and/or laboratory method detection limit
Samples collected prior to 2019 are provided in previous Phase IV Status Reports.
Sodium and sulfate were removed from the sampling plan in May 2020 as parameters were within 10% of the baseline

Table 2
Groundwater Analytical Results SPD Area Monitoring Network
DCAMM - Medfield State Hospital
Medfield, Massachusetts

Parameter	Units	MCP Standards			GW-1 Area							GW-1 Area							
					CD-MW-504							CD-MW-505							
		GW-1	GW-2	GW-3	5/30/2019	9/4/2019	11/21/2019	2/18/2020	5/22/2020	8/20/2020	11/17/2020	5/30/2019	9/4/2019	11/20/2019	11/20/19 DUP-2	2/18/2020	5/22/2020	8/20/2020	11/17/2020
Metals																			
Sodium	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hardness	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAM 14 Metals																			
Antimony	µg/L	6	~	8000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	µg/L	10	~	900	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Barium	µg/L	2000	~	50000	**48**	**69**	**70**	**54**	**41**	**42**	**46**	**26**	**35**	**45**	**43**	**28**	**26**	**40**	**41**
Beryllium	µg/L	4	~	200	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Cadmium	µg/L	5	~	4	**0.81**	**0.90**	**0.80**	**0.82**	**0.55**	**0.91**	**0.81**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chromium (Total)	µg/L	100	~	300	<1.0	<1.0	<1.0	<1.0	<1.0	**1.2**	**1.6**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Lead	µg/L	15	~	10	**35**	**52**	**50**	**39**	**30**	**38**	**29**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Mercury	mg/L	0.002	~	0.02	<0.00010	**0.00017**	<0.00010	<0.00010	0.00011	0.00011	<0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Nickel	µg/L	100	~	200	**6.5**	**8.3**	**9.1**	**6.5**	**5.8**	**7.0**	**6.1**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Thallium	µg/L	2	~	3000	<0.20	**0.25**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium	µg/L	30	~	4000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Zinc	µg/L	5000	~	900	**150**	**150**	**180**	**150**	**97**	**98**	**92**	<10	<10	<10	<10	<10	<10	<10	<10
Solids																			
Total Dissolved Solids (TDS)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organics																			
Total Organic Carbons (TOC)	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry																			
Sulfate	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate	mg/l	~	~	~	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOC 8260**																			
Acetone	µg/L	6300	50000	50000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
tert-Amyl Methyl Ether TAME	µg/L	~	~	~	<0.50	<0.50	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<0.50
Bromodichloromethane	µg/L	3	6	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	µg/L	10	7	800	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0
2-Butanone MEK	µg/L	4000	50000	50000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chlorobenzene	µg/L	100	200	1000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.1**
Chlorodibromomethane	µg/L	2	20	50000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloromethane	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene	µg/L	600	8000	2000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethylene	µg/L	70	20	50000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**9.2**	**4**	**3.5**	**3.7**	**5.9**	**3.2**	**3.9**	**5.6**
Naphthalene	µg/L	140	700	20000	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethylene	µg/L	5	50	30000	**2.0**	**1.5**	**1.2**	**1.2**	**1.3**	**1.4**	**1.5**	**12**	**5.7**	**10**	**10**	**4.4**	**16**	**7.7**	**6.6**
Tetrahydrofuran	µg/L	~	~	~	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Toluene	µg/L	1000	50000	40000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	µg/L	5	5	5000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.0**	**13**	**6.6**	**5.3**	**5.1**	**5.0**	**3.5**	**4.9**	**4.1**
Vinyl Chloride	µg/L	2	2	50000	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	**7.3**	**2.2**	<2.0	<2.0	**6.6**	<2.0	<2.0	<2.0
SVOC 8270																			
Benzo(a)pyrene (low)	µg/L	0.2	~	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

QC by RM-H 12.15.20

Abbreviations:
CAM = Compendium of Analytical Methods
VOC = Volatile Organic Compound
SVOC = Semi Volatile Organic Compounds
ug/L = microgram per liter
mg/L = milligrams per liter
~ = No Standard
NA = Not Analyzed
< = parameters not detected above laboratory method detection limit shown.

BOLD Exceeds lab method detection limit.
BOLD Exceeds applicable MCP standards.

Notes:
- Analytical results compared to the Massachusetts Contingency Plan (MCP) Method 1 Cleanup Standards 310 CMR 40.0000, revised January 2015.
*- wells are compared to GW-1 or GW-2, as noted in the header. All wells are compared to GW-3
- An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
**Compounds not shown have no exceedances of the MCP Method 1 Criteria and/or laboratory method detection limit
Samples collected prior to 2019 are provided in previous Phase IV Status Reports.
Sodium and sulfate were removed from the sampling plan in May 2020 as parameters were within 10% of the baseline

Table 3 - Summary of PCE Soil Analytical Results
SPD Area
DCAMM - Medfield State Hospital
Medfield, Massachusetts

VOCs 8260C			Tetrachloroethylene (PCE)
			mg/Kg
MCP - Method 1 Cleanup Standards		**S-1/GW-2**	10
SAMPLING LOCATION	**Date**	**Depth (ft.)**	
SB-B2 (0-2.5)	6/3/2019	0-2.5	<0.0015
SB-B2 (15-18)		15-18	<0.0010
SB-B4 (20-21)		20-21	<0.0014
SB-C3 (0-2.5)	6/4/2019	0-2.5	**0.003**
SB-C3 (15-16.5)		15-16.5	<0.0012
SB-C3 (16.5-18)		16.5-18	<0.0012
SB-C5 (0-2.5)		0-2.5	**0.0013**
SB-C5 (15-17.5)		15-17.5	<0.0012
SB-C5 (17.5-20)		17.5-20	<0.0011
SB-C6 (15-18)		15-18	<0.0013
SB-C6 (18-20)		18-20	<0.0012
SB-C11 (19-20)	6/6/2019	19-20	<0.0012
SB-D4 (19-20)		19-20	<0.0010
SB-D5 (16-20)	6/5/2019	16-20	<0.0016
SB-E3 (19-20)	6/6/2019	19-20	<0.0010
SB-E5 (19-20)	6/5/2019	19-20	<0.0011
SB-E6 (10-12)	6/7/2019	10-12	**0.0016**
SB-E6 (18-20)		18-20	<0.0012
SB-E6D (29-30)	3/12/2020	29-30	**0.0044**
SB-E7 (20-21.5)	6/3/2019	20-21.5	<0.0013
SB-F6 (10-12)	6/5/2019	10-12	**0.0046**
SB-F6 (18-20)		18-20	**0.0027**
SB-F6D(25-26)	3/16/2020	25-26	**0.0064**
SB-F7 (14-16)	6/7/2019	14-16	<0.0011
SB-F7 (17-18)		17-18	<0.0011
SB-F10 (19-20)	6/6/2019	19-20	<0.0012
SB-G5 (19-20)	6/7/2019	19-20	<0.0013
SB-G6 (10-15')	9/24/2019	10-15	**5.1**
SB-G6 (15-20')		15-20	<0.0010
SB-G7 (13-15)	6/5/2019	13-15	<0.0017
SB-G7 (17-18)		17-18	<0.0018
SB-GH56 (15-17)	3/10/2020	15-17	<0.0019
SB-H6 (14-16)	3/9/2020	14-16	<0.00087
SB-H6 (16-18)		16-18	<0.00094
SB-H7 (15-15.5)	3/10/2020	15-15.5	<0.0021

Abbreviations:
VOCs = Volatile Organic Compounds
mg/Kg = milligrams per kilogram
< = parameters not detected above laboratory method detection limit shown.
BOLD Exceeds lab method detection limit.

Notes:

- Analytical results compared to the Massachusetts Contingency Plan (MCP) Method 1 Cleanup Standards 310 CMR 40.0000, revised January 2015.

Table 4
Summary of Soil Parameters
DCAMM - Medfield State Hospital
Medfield, Massachusetts

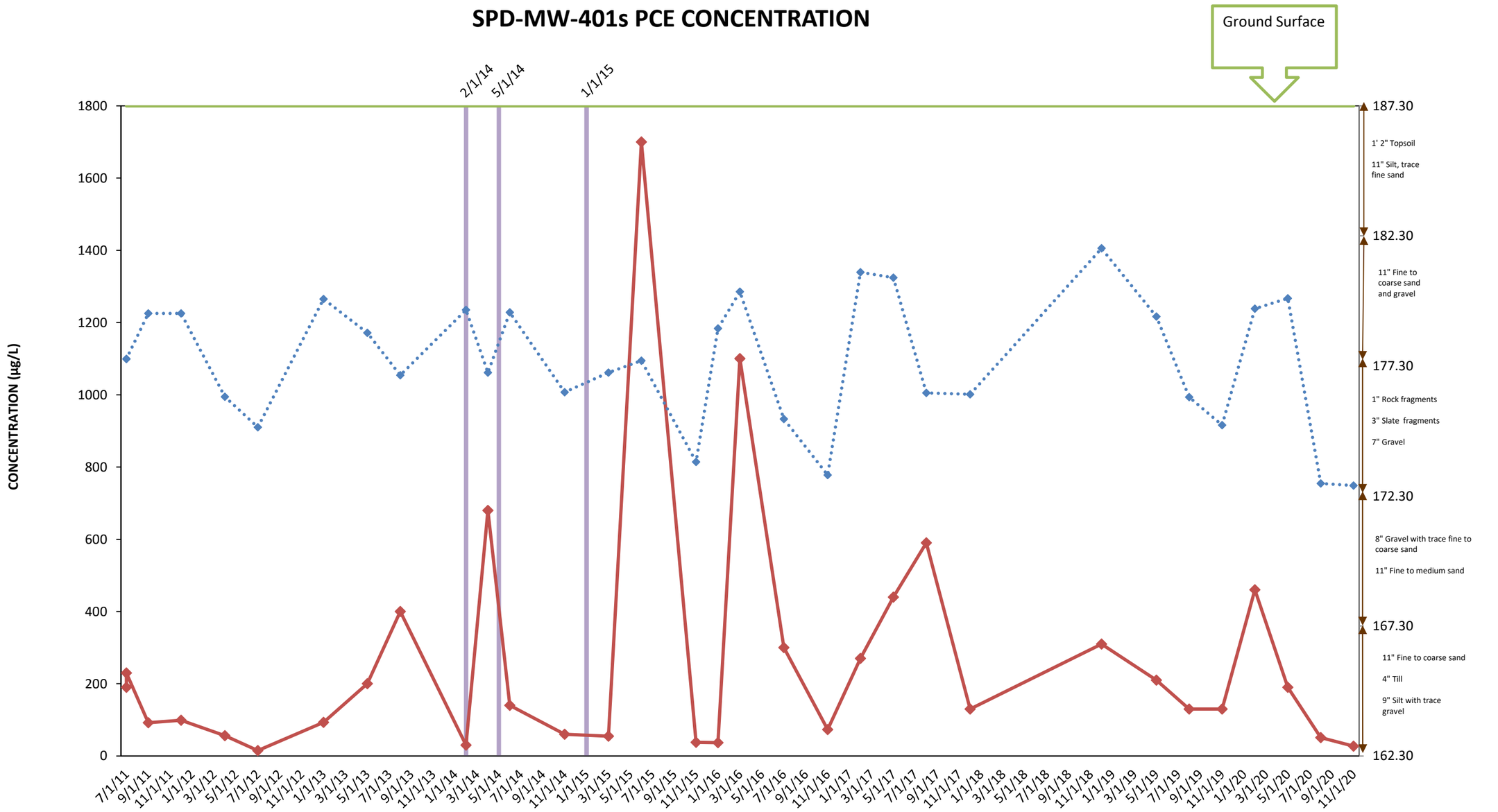
Parameter	Units	SAMPLING LOCATION	
		SB-E6D (14-18)	SB-F6D (10-14)
		3/11/2020 2:00:00 PM	3/13/2020 1:30:00 PM
		14-18 Feet	10-14 Feet
Silica Analysis by 6010B			
Dissolved Silica	mg/kg	**67.8**	**35**
Total Silica	%	**62.7**	**68.8**
SM 21-22 4500 P E Modified			
Total Phosphorous	mg/Kg	**3.1**	**4.3**
SW-846 6010D			
Manganese	mg/Kg	**180**	**210**
% Solids			
Percent Solid	%	**91.2**	**88.9**

Abbreviations:
mg/Kg = milligrams per kilogram
BOLD Exceeds lab method detection limit.

APPENDIX A

Trend Graphs

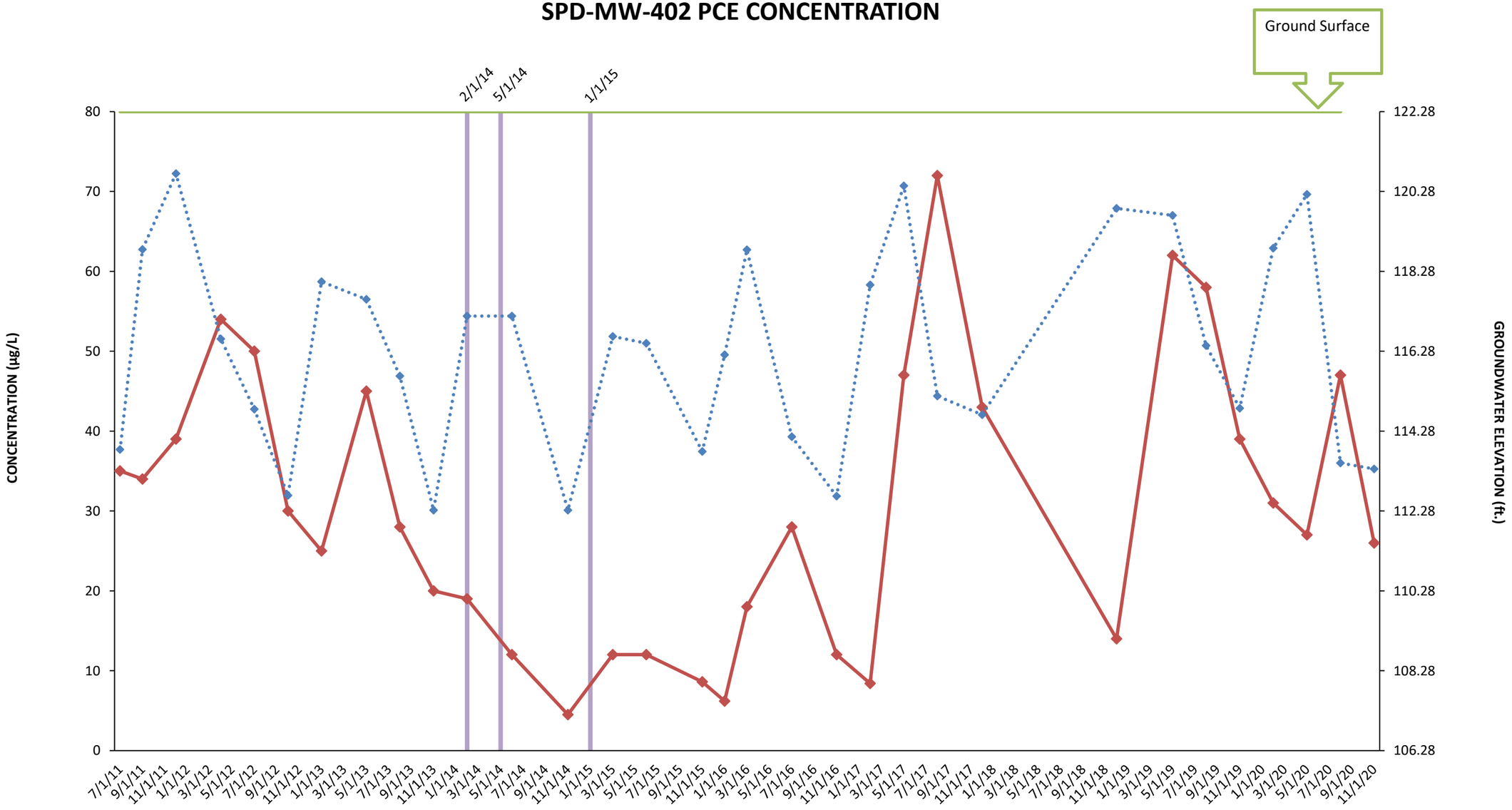
SPD-MW-401s PCE CONCENTRATION



Date	3/5/15	6/15/15	11/12/15	1/12/16	3/28/16	7/12/16	11/14/16	2/6/17	5/16/17	8/29/17	12/4/17	12/3/18	5/28/19	8/28/19	11/19/19	2/19/20	5/22/20	8/21/20	11/16/20	Post-ISCO Avg
PCE Conc.	55	1700	38	37	1100	300	73	270	440	590	130	310	210	130	130	460	190	51	27	328.47
GW Elevation	177.04	177.50	173.61	178.74	180.15	175.26	173.10	180.90	180.69	176.26	176.21	181.82	179.20	176.10	175.02	179.50	179.90	172.78	172.70	177.18

Injection Event — PCE Conc. — GW Elevation — Ground Surface

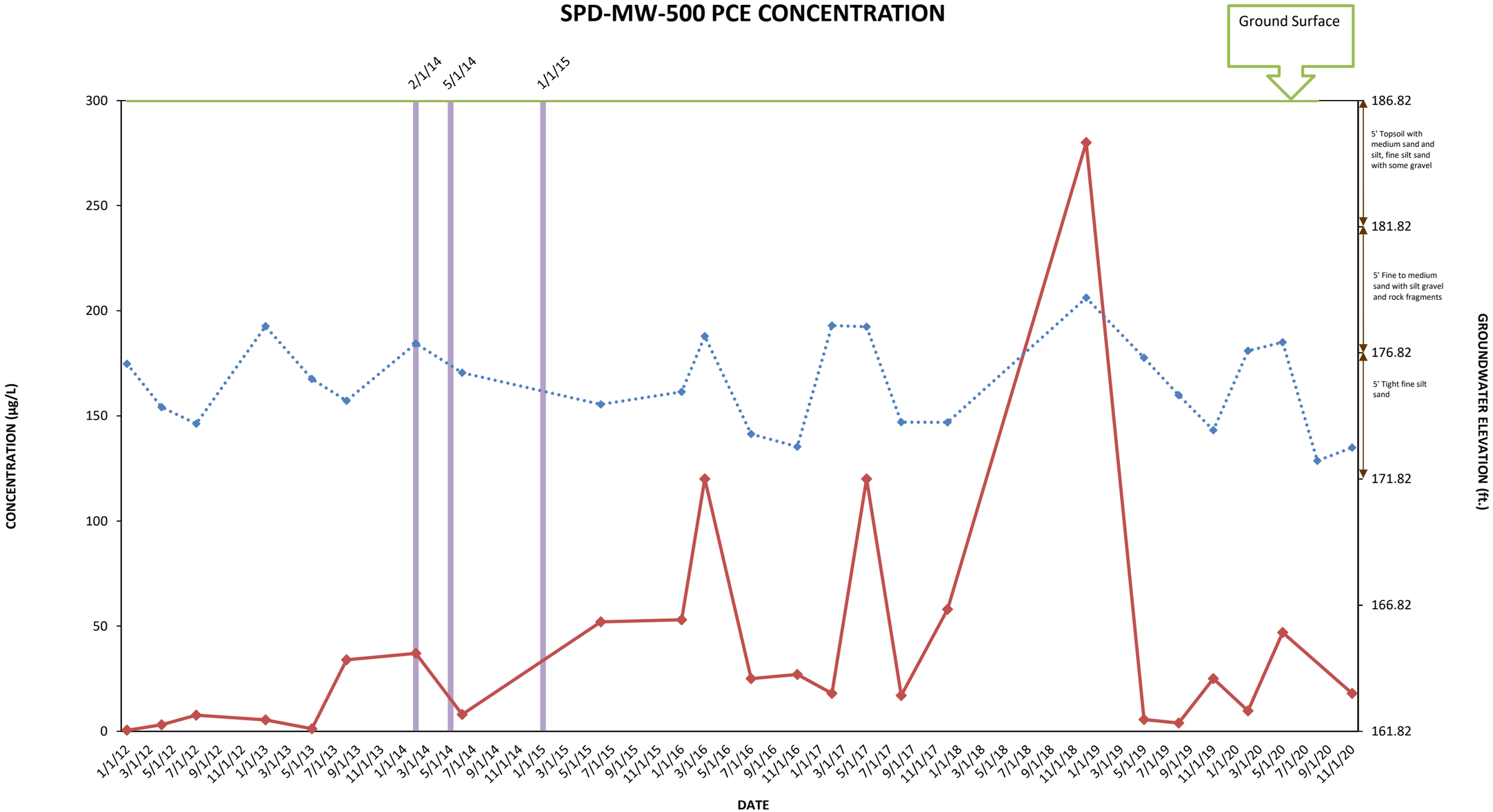
SPD-MW-402 PCE CONCENTRATION



Date	3/5/15	6/15/15	11/12/15	1/13/16	3/30/16	7/13/16	11/14/16	2/6/17	5/16/17	8/31/17	12/6/17	12/5/18	5/30/19	8/28/19	11/20/19	2/18/20	5/22/20	8/21/20	11/16/20	Post-ISCO Avg
PCE Conc.	12	12	8.6	6.2	18	28	12	8.4	47	72	43	14	62	58	39	31	27	47	26	30.06
GW Elevation	116.65	116.48	113.77	116.19	118.8	114.14	112.65	117.94	120.42	115.16	114.69	119.86	119.68	116.42	114.85	118.86	120.21	113.48	113.33	116.51

Injection Event PCE Conc. GW Elevation Ground Surface

SPD-MW-500 PCE CONCENTRATION

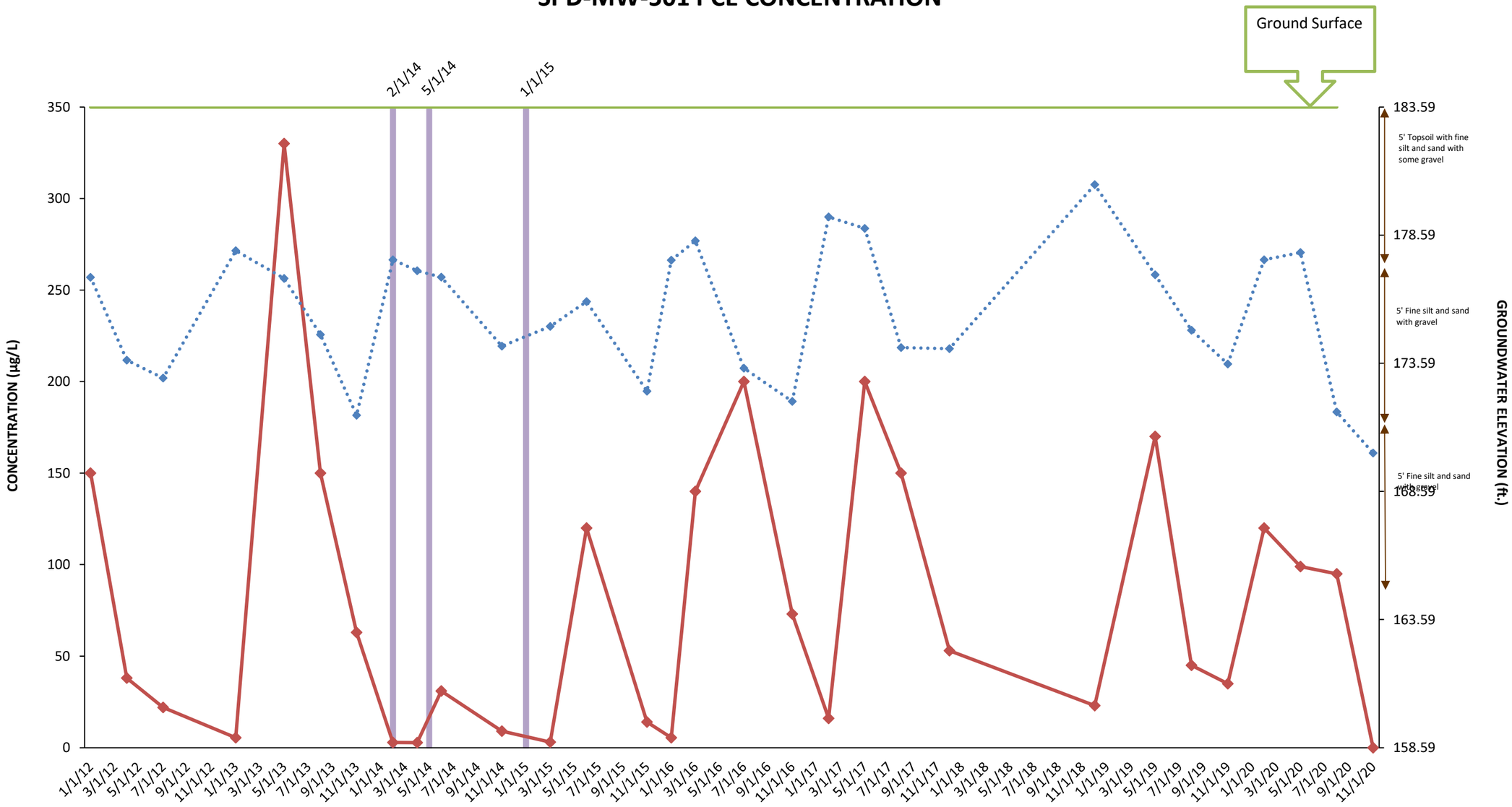


Date	6/16/15	1/12/16	3/29/16	7/13/16	11/14/16	2/8/17	5/16/17	8/29/17	12/7/17	12/3/18	5/29/19	8/28/19	11/20/19	2/19/20	5/21/20	8/21/20	11/16/20	Post-ISCO Avg
PCE Conc.	52	53	120	25	27	18	120	17	58	280	5.6	3.9	25	9.7	47	NS	18	54.95
GW Elevation	174.77	175.27	177.48	173.6	173.1	177.9	177.85	174.07	174.06	179	176.62	175.14	173.75	176.9	177.24	172.54	173.06	175.43

Notes:
1. No sample was collected during the August 2020 due to poor recharge within well.

Injection Event | PCE Conc. | GW Elevation | Ground Surface

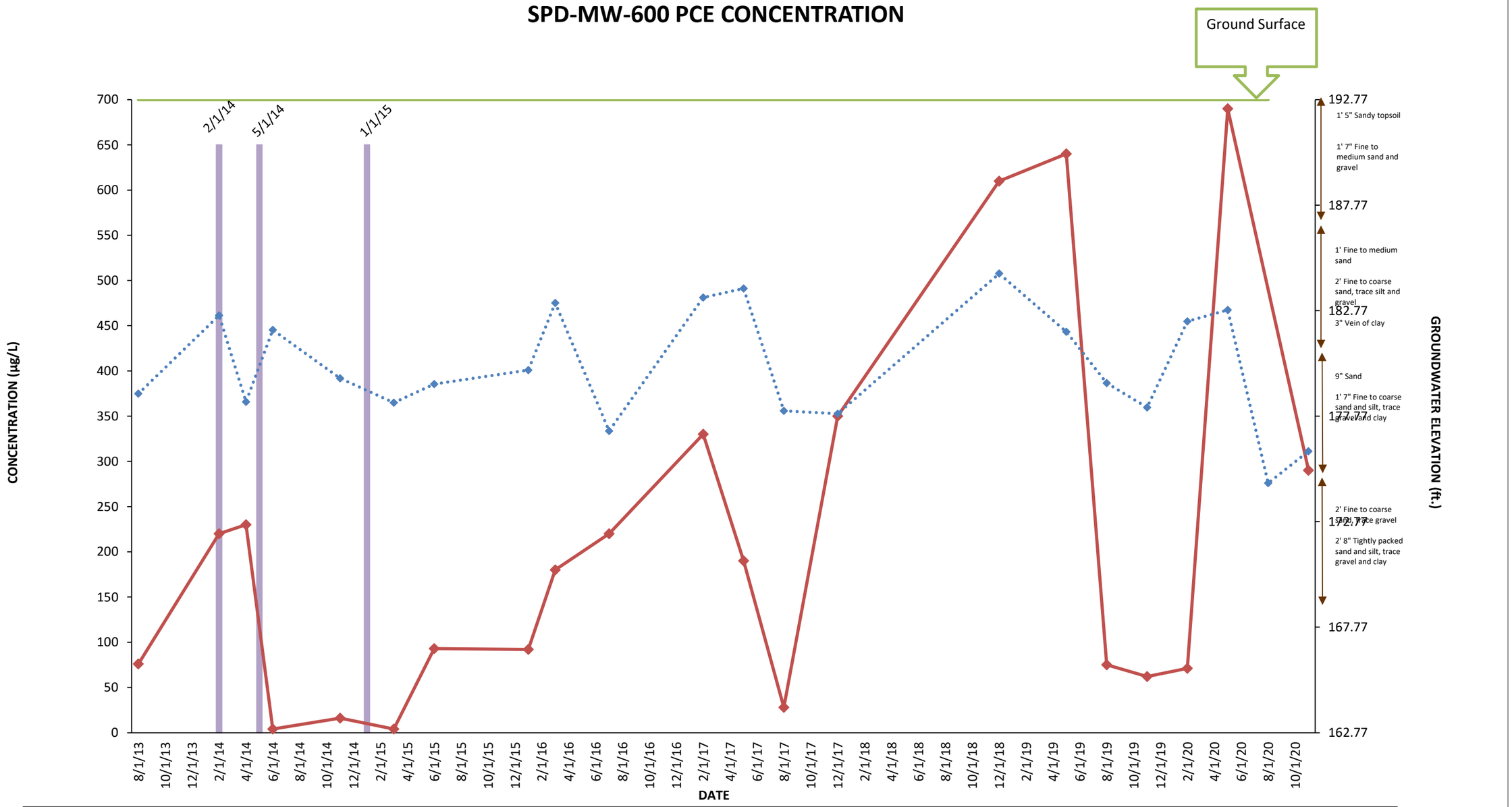
SPD-MW-501 PCE CONCENTRATION



Date	3/4/15	6/15/15	11/12/15	1/14/16	3/26/16	7/13/16	11/14/16	2/6/17	5/16/17	8/29/17	12/5/17	12/4/18	5/29/19	8/28/19	11/20/19	2/19/20	5/21/20	8/21/20	11/16/20	Post-ISCO Avg
PCE Conc.	3.1	120	14	5.4	140	200	73	16	200	150	53	23	170	45	35	120	99	95	NS	86.75
GW Elevation	175.03	176	172.5	177.61	178.37	173.4	172.1	179.3	178.85	174.2	174.16	180.56	177.04	174.88	173.56	177.63	177.91	171.69	170.09	175.52

Injection Event — PCE Conc. — GW Elevation — Ground Surface

SPD-MW-600 PCE CONCENTRATION

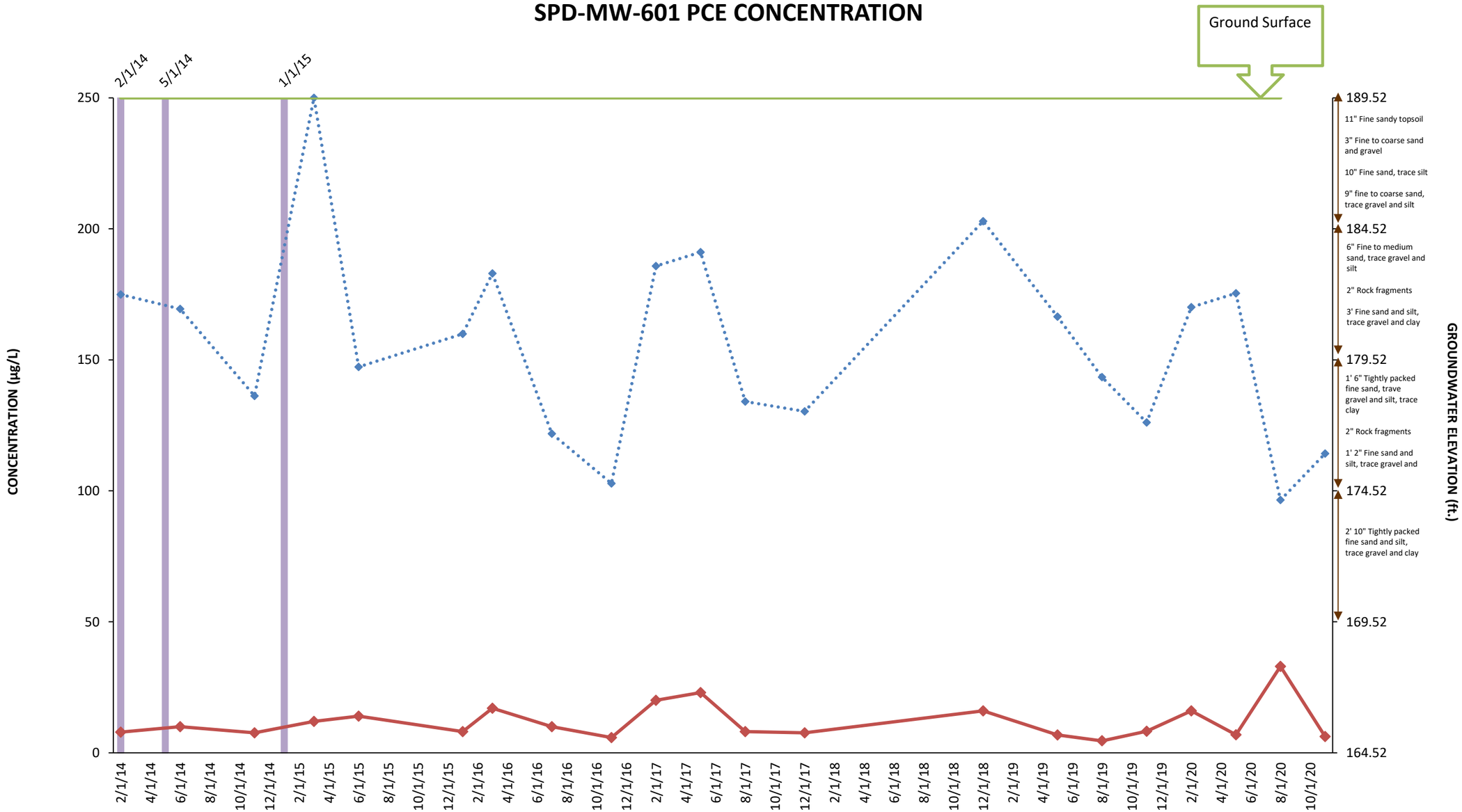


Date	3/5/15	6/15/15	1/12/16	3/29/16	7/12/16	2/6/17	5/15/17	8/29/17	12/5/17	12/3/18	5/29/19	8/28/19	11/19/19	2/19/20	5/21/20	8/21/20	11/16/20	Post-ISCO Avg
PCE Conc.	4	93	92	180	220	330	190	28	350	610	640	75	62	71	690	NS	290	242.33
GW Elevation	178.41	179.29	179.95	183.13	177.07	183.39	183.82	178.02	177.88	184.53	181.77	179.34	178.18	182.26	182.8	174.6	176.11	180.03

Notes:
1. No sample was collected during the August 2020 due to poor recharge within well.

Injection Event — PCE Conc. — GW Elevation — Ground Surface

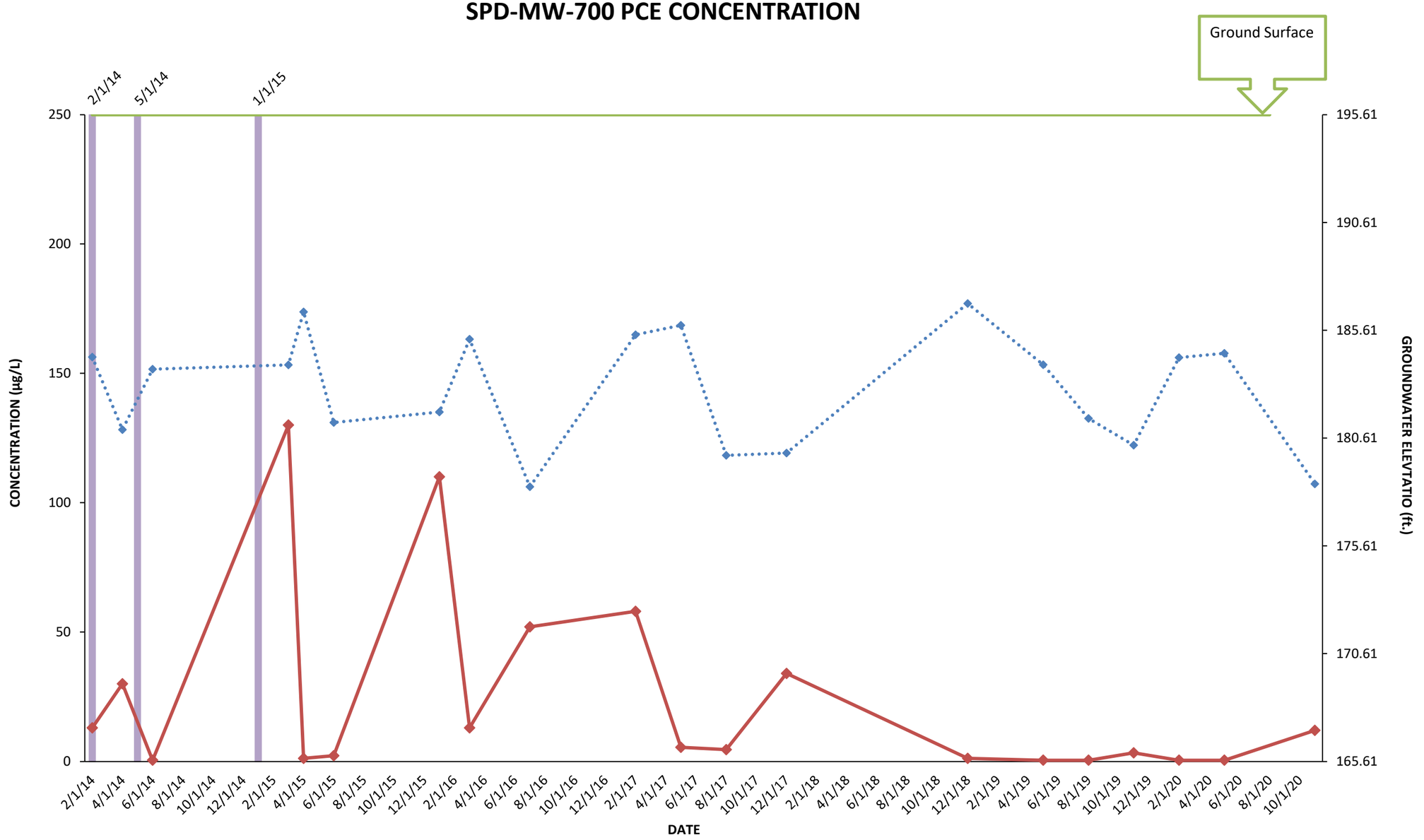
SPD-MW-601 PCE CONCENTRATION



Date	3/5/15	6/15/15	1/12/16	3/29/16	7/12/16	11/14/16	2/6/17	5/15/17	8/29/17	12/4/17	12/3/18	5/29/19	8/28/19	11/19/19	2/19/20	5/22/20	8/21/20	11/16/20	Post-ISCO Avg
PCE Conc.	12	14	8.1	17	10	5.8	20	23	8.1	7.6	16	6.8	4.6	8.2	16	6.9	33	6.2	12.41
GW Elevation	189.52	179.25	180.51	182.82	176.7	174.8	183.1	183.63	177.93	177.55	184.81	181.17	178.86	177.13	181.53	182.06	174.17	175.94	180.08

Injection Event — PCE Conc. — GW Elevation — Ground Surface

SPD-MW-700 PCE CONCENTRATION

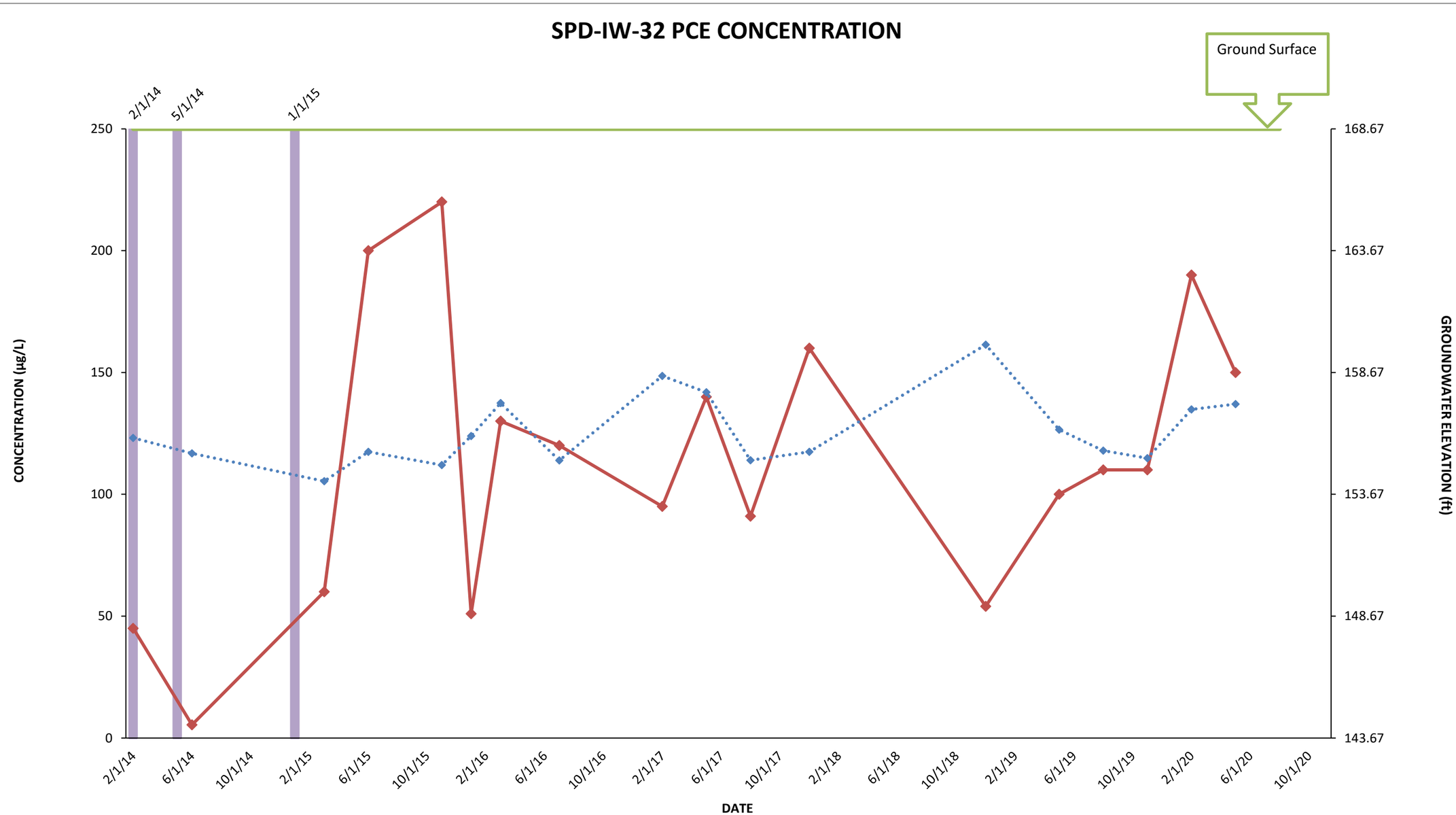


Date	3/5/15	4/8/15	6/16/15	1/12/16	3/28/16	7/13/16	2/6/17	5/15/17	8/29/17	12/5/17	12/3/18	5/29/19	8/28/19	11/19/19	2/19/20	5/22/20	8/21/20	11/16/20	Post-ISCO Avg
PCE Conc.	130	1.2	2.2	110	13	52	58	5.5	4.6	34	1.2	0.5	0.5	3.3	0.5	0.5	NS	12	26.06
GW Elevation	184	186.46	181.33	181.82	185.19	178.35	185.4	185.84	179.81	179.91	186.85	184.01	181.52	180.28	184.34	184.54	DRY	178.48	183.10

Notes:
1. No sample was collected during the August 2020 due to lack of groundwater within the well.

Injection Event PCE Conc. GW Elevation Ground Surface

SPD-IW-32 PCE CONCENTRATION

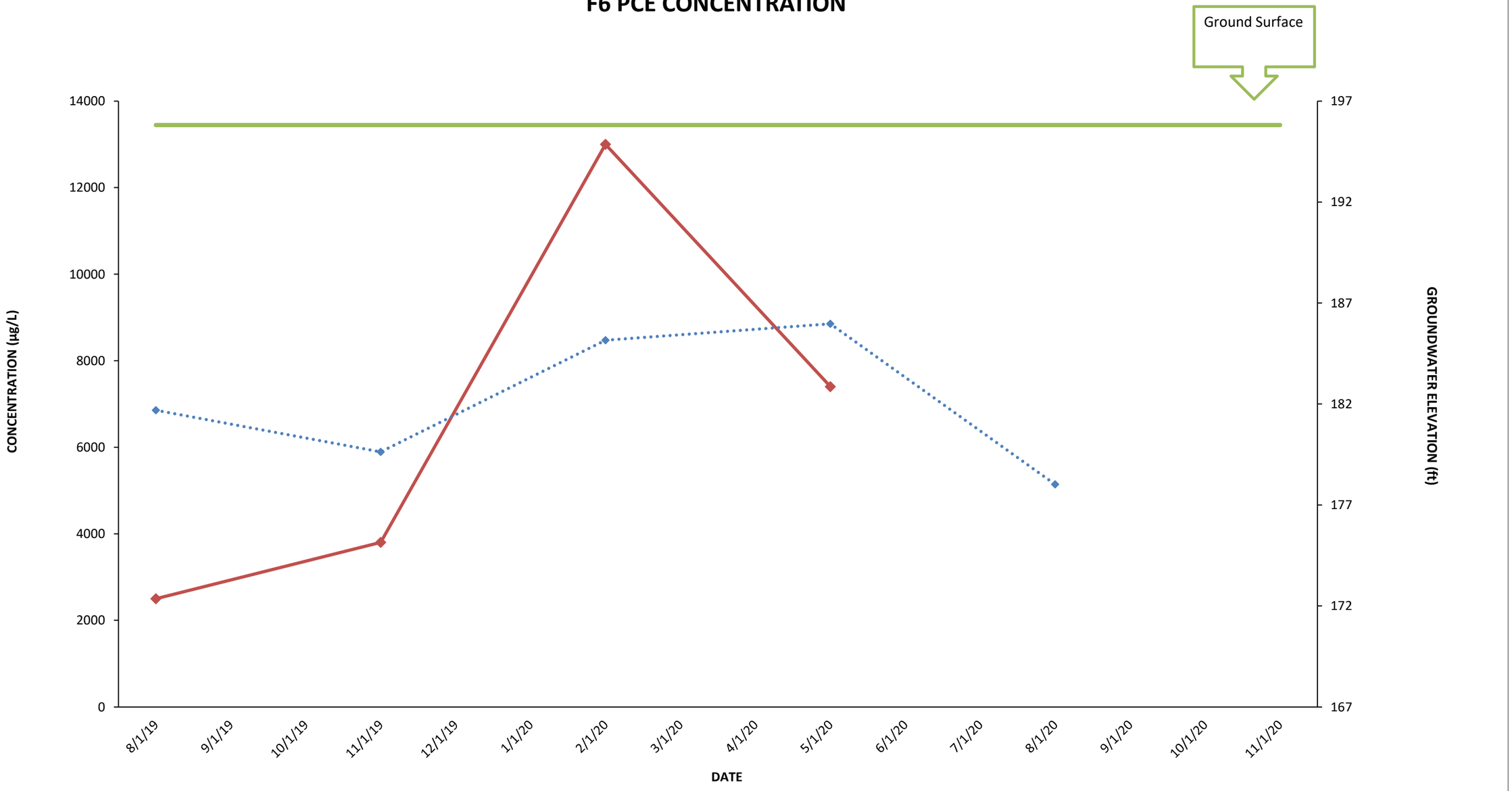


Date	3/5/15	6/16/15	11/12/15	1/12/16	3/29/16	7/13/16	2/6/17	5/16/17	8/31/17	12/5/17	12/3/18	5/29/19	8/28/19	11/19/19	2/19/20	5/21/20	8/21/20	11/16/20	Post-ISCO Avg
PCE Conc.	60	200	220	51	130	120	95	140	91	160	54	100	110	110	190	150	NS	NS	123.81
GW Elevation	154.21	155.41	154.87	156.06	157.41	155.06	158.53	157.86	155.07	155.41	159.81	156.32	155.46	155.15	157.15	156.37	DRY	DRY	156.26

Notes:
1. No sample was collected during the August and November 2020 round due to lack of groundwater within the well.

Injection Event PCE Conc. GW Elevation Ground Surface

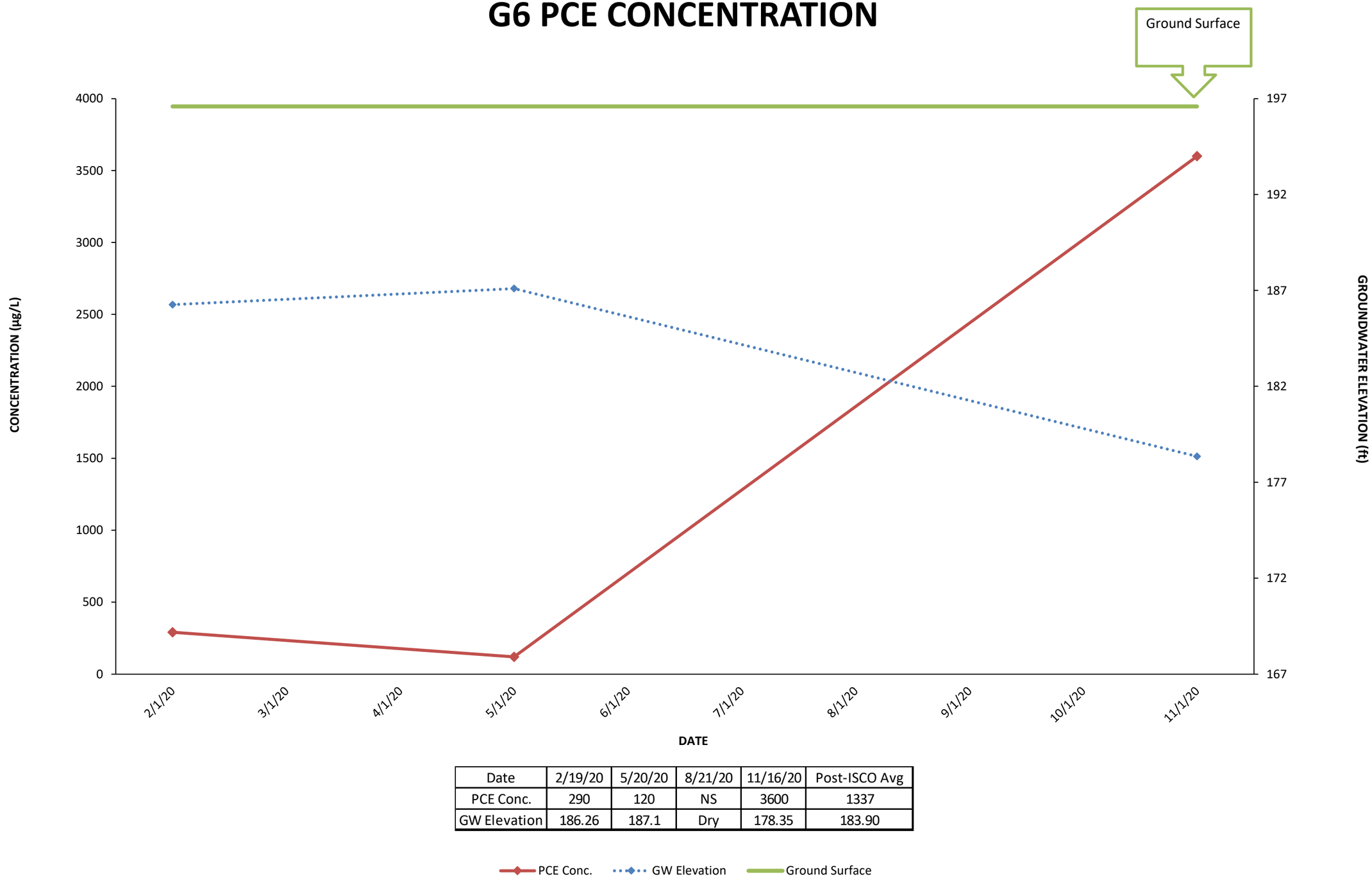
F6 PCE CONCENTRATION



Date	8/28/19	11/19/19	2/19/20	5/20/20	8/21/20	11/16/20	Post-ISCO Avg
PCE Conc.	2500	3800	13000	7400	dry	dry	6675
GW Elevation	181.69	179.63	185.16	185.97	178.02	dry	182.16

PCE Conc. GW Elevation Ground Surface

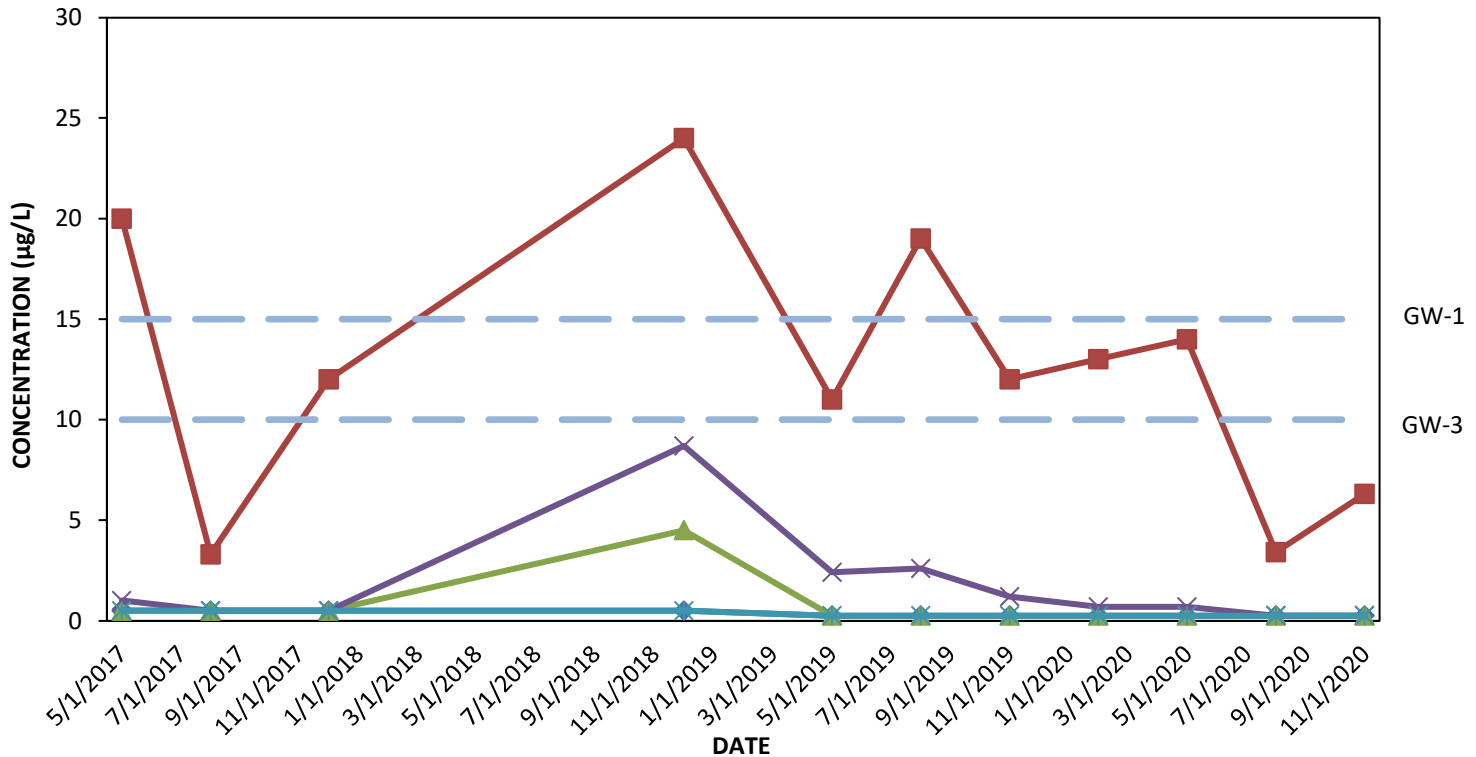
G6 PCE CONCENTRATION



Date	2/19/20	5/20/20	8/21/20	11/16/20	Post-ISCO Avg
PCE Conc.	290	120	NS	3600	1337
GW Elevation	186.26	187.1	Dry	178.35	183.90

PCE Conc. GW Elevation Ground Surface

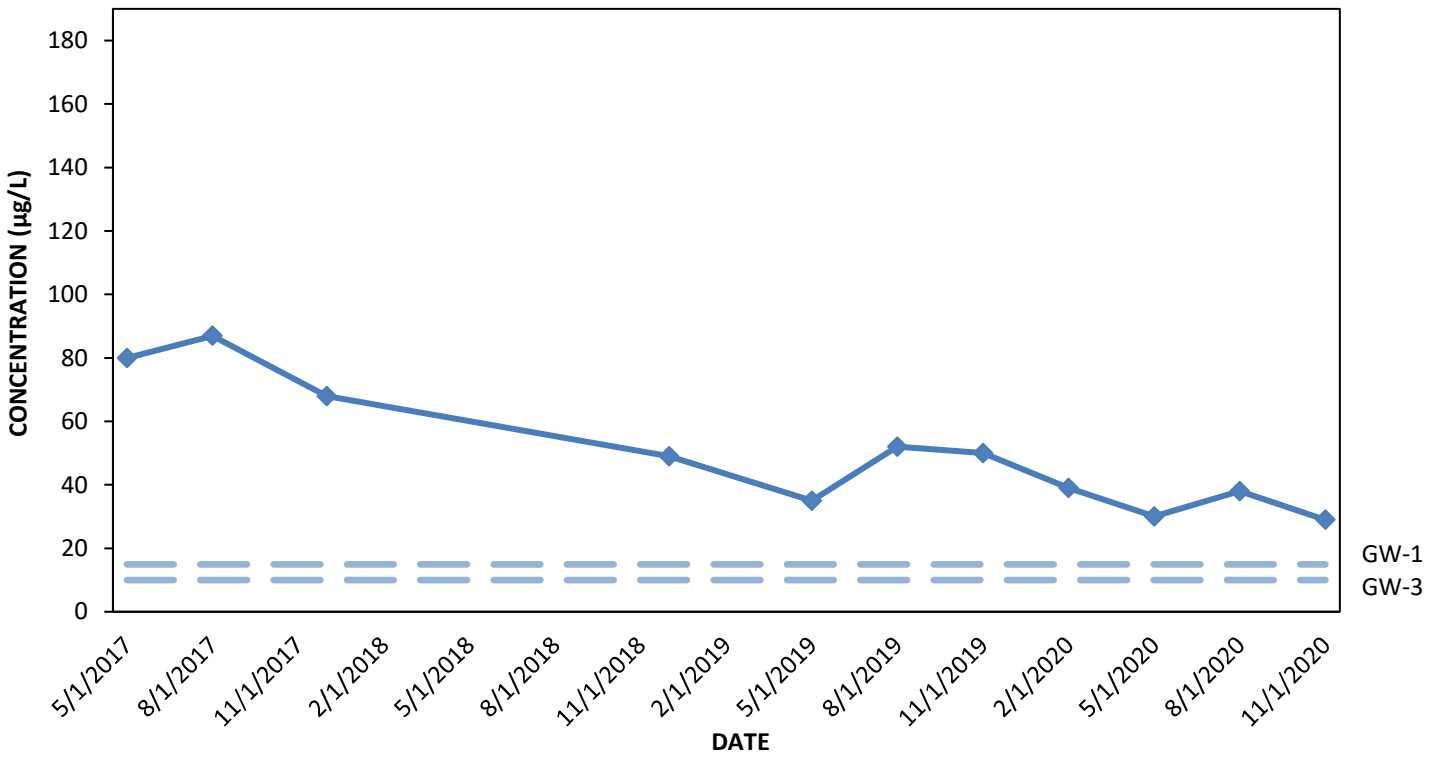
LEAD CONCENTRATIONS IN C&D AREA WELLS



	5/15/2017	8/31/2017	12/7/2017	12/4/2018	5/30/2019	8/28/2019	11/21/2019	2/18/2020	5/22/2020	8/20/2020	11/16/2020
CD-MW-500	0.5	0.5	0.5	0.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25
CD-MW-501	20	3.3	12	24	11	19	12	13	14	3.4	6.3
CD-MW-502	0.5	0.5	0.5	4.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25
CD-MW-503	1	0.5	0.5	8.7	2.4	2.6	1.2	0.68	0.69	0.25	0.25
CD-MW-505	0.5	0.5	0.5	0.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25

Note: Non-detect concentrations are shown as half of the laboratory detection limit

LEAD CONCENTRATIONS IN CD-MW-504

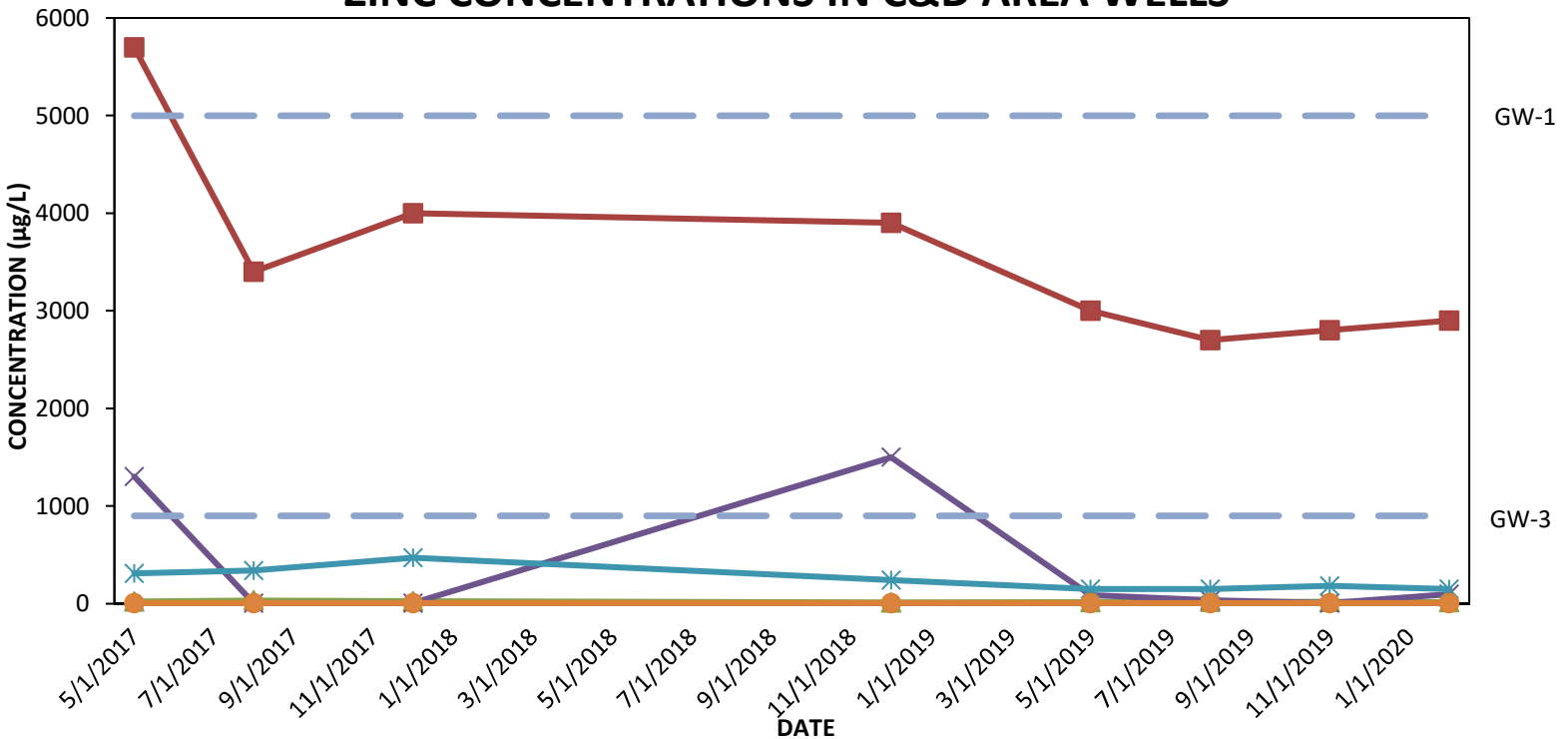


Note: Non-detect concentrations are shown as half of the laboratory detection limit

	5/15/2017	8/31/2017	12/7/2017	12/4/2018	5/30/2019	8/28/2019	11/21/2019	2/18/2020	5/22/2020	8/20/2020	11/16/2020
CD-MW-504	80	87	68	49	35	52	50	39	30	38	29

CD-MW-504

ZINC CONCENTRATIONS IN C&D AREA WELLS



	5/15/2017	8/31/2017	12/7/2017	12/4/2018	5/30/2019	8/28/2019	11/21/2019	2/18/2020	5/22/2020	8/20/2020	11/16/2020
CD-MW-500	5	5	5	5	5	5	5	5	5	5	5
CD-MW-501	5700	3400	4000	3900	3000	2700	2800	2900	2400	2500	2200
CD-MW-502	22	33	26	12	16	19	18	13	5	11	5
CD-MW-503	1300	5	5	1500	88	33	5	97	300	12	18
CD-MW-504	310	340	470	240	150	150	180	150	97	98	92
CD-MW-505	5	5	11	5	5	5	5	5	5	5	5

Note: Non-detect concentrations are shown as half of the laboratory detection limit

APPENDIX B

Soil Boring Logs

Weston & Sampson

PROJECT: SPD Locations

REPORT OF BORING No. SPD-SB-300

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN Hayes

WSE GEOLOGIST: EBF

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 12/21/10 DATE END 12/21/10

SAMPLER: Geoprobe

CASING: 1"

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			60/50	0-5		1.7	0-5" Black asphalt		
							5-12" Brown fine to medium SAND and GRAVEL		
							12-15" Gray rock fragments		
5							15-22" Brown fine SAND and SILT trace GRAVEL		
							22-26" Gray rock fragments		
							26-39" Brown - light brown fine SAND		damp
							39-44" Gray powder/rock fragment		
10							44-50" Brown fine SAND and SILT		very tight
			60/60	5-10		1.4	0-4" Brown medium SAND		damp
							4-60" Brown fine SAND and SILT trace GRAVEL		
			60/44	10-15		1.2	0-11" Dark brown SILT and fine SAND trace coarse SAND		
15							11-44" Brown SILT and fine SAND trace GRAVEL		slightly damp
			60/35	15-20		1.7	0-24" Brown fine to coarse SAND		very wet
							24-30" Brown fine SAND and SILT		
20							30-35" Gray rock fragments and brown SILT		dry
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

(1) Wet at 10.3' bgs

(2) Sample at 10' bgs and 15' bgs for VOC 8260.

SPD-SB-300 observation well installed at this location

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-300

Weston & Sampson

PROJECT: SPD Locations

REPORT OF BORING No. SPD-SB-301

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN Hayes

WSE GEOLOGIST: EBF

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 12/21/10 DATE END 12/21/10

SAMPLER: Geoprobe

CASING: 1"

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			60/30	0-5		0.4	0-9" Dark gray-black fine to medium SAND		
							9-10" Rust-colored coarse SAND		
							10-19" Black FILL medium to coarse SAND and GRAVEL		
5							19-30" Tan fine to medium SAND trace GRAVEL		
			60/28	5-10		0.4	0-4" Black FILL (medium to coarse SAND and GRAVEL)		
10							4-28" Brown-orange fine SAND little SILT trace GRAVEL		Damp Very tight
			60/42	10-15		0.3	0-5" Dark brown fine SAND and SILT some GRAVEL; mottling observed	(1)	
							5-42" Tan SILT and CLAY trace GRAVEL		Damp
15			60/26	15-20		1.4	0-10" Brown SILT and CLAY with black GRAVEL (likely fill) some mottling		Damp
							10-14" Brown GRAVEL		
							14-26" Brown fine SAND and SILT		
			60/24	20-25		1.3	0-24" Brown SILT and fine SAND trace GRAVEL		Very tight
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

(1) Location initially drilled to 15' bgs and left; upon return well was dry. Location drilled to 25' bgs.

(2) Water at 13.5' bgs. Sample collected 13.5' and 18.5' bgs for VOC 8260.

SPD-SB-301 observation well installed at this location

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-301

Weston & Sampson

PROJECT: SPD Locations

REPORT OF BORING No. SPD-SB-302

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech | BORING LOCATION See attached plan

FOREMAN Hayes | GROUND SURFACE ELEV. | DATUM

WSE GEOLOGIST: EBF | DATE START 12/21/10 | DATE END 12/21/10

SAMPLER: Geoprobe

CASING: 1"

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			60/38	0-5		2.3	0-9" Topsoil		
							9-14" Tan coarse to medium SAND		
							14-38" Gray ash and rockfragments		
							medium to coarse SAND trace		
5							GRAVEL		
			60/41	5-10		1.3	0-13" Gray ash and rock fragments,		
							medium to coarse SAND trace		
							GRAVEL		
							13-41" Brown coarse SAND and		wet
10			60/38	10-15		4.4	0-13" Brown coarse SAND and GRAVEL		wet
							13-38" Brown fine SAND and SILT little		
							GRAVEL		damp
15									
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

(1) Sample collected 6' and 11' bgs for VOC 8260.

SPD-SB-302 observation well installed at this location

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-302

Weston & Sampson

PROJECT: SPD Locations

REPORT OF BORING No. SPD-SB-303

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN Hayes

WSE GEOLOGIST: EBF

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 12/21/10 DATE END 12/21/10

SAMPLER: Geoprobe

CASING: 1"

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			60/46	0-5		1.3	0-8" Topsoil		
							8-16" Brown fine SAND		
							16-18" Light green rock fragments		
							18-34" Brown fine to coarse SAND and SILT some GRAVEL		
5							34-36" Brown medium SAND		
			60/45	5-10		0.3	0-7" Brown fine SAND and SILT some large GRAVEL		
							7-11" Brown fine to medium SAND		
10							11-33" Brown fine SAND and SILT		
							33-45" Brown fine SAND and SILT trace coarse SAND		
			60/32	10-15		1.6	0-5" Brown SILT little fine SAND		
							5-10" Brown fine SAND and SILT		
15							10-22" Brown fine to coarse SAND trace GRAVEL		damp
							22-32" Brown medium to coarse SAND and GRAVEL		moist
			60/40	15-20		0.8	0-8" Brown medium to coarse SAND trace GRAVEL		wet
20							8-40" Brown fine SAND and SILT trace coarse SAND		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

(1) Wet at 8' bgs.

(2) Sample collected 8' and 13' bgs for VOC 8260.

SPD-SB-303 observation well installed at this location

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-303

Weston & Sampson

PROJECT: SPD Locations

REPORT OF BORING No. SPD-SB-304

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN Steve

WSE GEOLOGIST: EBF

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 12/30/10 DATE END 12/30/10

SAMPLER: Geoprobe

CASING: 1"

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			60/35	0-5		0.4	0-6" Black fill (asphalt-like gravel pieces)		
							6-35" Dark brown SILT trace fine SAND		
							trace GRAVEL		Loose
			60/38	5-10		0.3	0-8" Dark brown SILT some GRAVEL		
5							8-29" Dark brown SILT little GRAVEL		
							trace wood fragments		Moist
							29-38" Brown SILT and fine SAND		
			60/36	10-15		0.4	0-6" Black fill (asphalt-like gravel pieces)		
							likely fall-in		
10							6-25" Brown fine SAND little SILT		
							25-36" Brown SILT trace fine SAND		Dry
			60/43	15-20		0.6	0-4" Brown coarse SAND and GRAVEL		Wet
							4-16" Brown SILT trace GRAVEL		Wet
							16-36" Brown SILT trace GRAVEL		Dry
15							36-43" Brown fine SAND		
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

(1) Wet at 13.45' bgs.

(2) Sample collected 13.5' and 18.5' bgs for VOC 8260.

SPD-SB-304 observation well installed at this location

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-304

Weston & Sampson

PROJECT: SPD Locations

REPORT OF BORING No. SPD-SB-305

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN Steve

WSE GEOLOGIST: EBF

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 12/30/10 DATE END 12/30/10

SAMPLER: Geoprobe

CASING: 1"

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			60/40	0-5		0.1	0-6" Topsoil (brown LOAM)		
							6-21" Black fill (asphalt-like gravel		
							21-30" Dark brown SILT little fine SAND		
							30-40" Tan fine SAND and SILT		Damp (likely perched)
5			60/48	5-10		0.2	0-2" Tan fine SAND and SILT		Damp
							2-7" Black fill (asphalt-like gravel pieces)		
							7-13" Brown GRAVEL and coarse SAND		Dry
							13-28" Brown fine to coarse SAND and GRAVEL		Tight
10							28-48" Brown fine SAND and SILT		
			60/32	10-15		0.1	0-3" Brown fine SAND and SILT		
							3-7" Black fill (likely fall-in)		
							7-19" Brown fine SAND and SILT		
							19-32" Brown fine to medium SAND and SILT trace GRAVEL		
15									
			60/34	15-20		0.1	0-13" Brown SAND and SILT		Wet
							13-21" Brown fine to medium SAND and GRAVEL		Tight
							21-34" Brown fine to medium SAND trace GRAVEL		Wet
20									
25									
30									
35									

GRANULAR SOILS BLOWS/FT	GRANULAR SOILS DENSITY	COHESIVE SOILS BLOWS/FT	COHESIVE SOILS DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

(1) Wet at 13.3' bgs.

(2) Sample collected 13.3' and 18.3' bgs for VOC 8260.

SPD-SB-305 observation well installed at this location

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-305

Weston & Sampson

PROJECT: SPD Locations

REPORT OF BORING No. SPD-SB-306

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN Steve and Hayes

WSE GEOLOGIST: EBF

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 12/30/10 DATE END 12/30/10

SAMPLER: Geoprobe

CASING: 1"

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			60/49	0-5		0.2	0-24" Brown fine SAND		
							24-49" Brown fine SAND and SILT		
			60/50	5-10		0.3	0-21" Brown SILT little GRAVEL trace		
							fine SAND		tight
5							21-49" Brown SILT trace GRAVEL		tight
							49-50" Brown SILT		
			60/60	10-15		0.3	0-14" Brown SILT trace fine SAND		Damp
							14-44" Brown fine SAND and SILT		Wet
							44-60" Brown fine SAND		Wet
10									
15									
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

(1) Wet at 8.5' bgs.

(2) Sample collected 8.8' and 13.8' bgs for VOC 8260.

(3) Measurements from ground surface in basement. Drilling from 1st floor. 1st floor 10' higher than basement.

SPD-SB-306 observation well installed at this location

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-306

Weston & Sampson

PROJECT
Medfield State Hospital
Medfield, MA
(Salvage Yard)

REPORT OF BORING No. SPD-SB-400D
SHEET 1 OF 1
Project No. 2110036.D
CHKD BY

BORING Co. Geosearch
FOREMAN Joe and Artie
WSE GEOLOGIST: Emily Faivre

BORING LOCATION See attached plan
GROUND SURFACE ELEV. DATUM
DATE START 6/28/11 DATE END 6/28/11

SAMPLER: Hollow Stem Augers
CASING:
CASING SIZE: N/A Method Direct push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			24/20	4-6	4-5-7-6	0.3	0-2" Black ASPHALT	(1)	
							2-20" Brown to gray, mottled SILT trace gravel		
							Damp at bottom		
5			24/24	6-8	5-5-10-10	0.2	0-6" Dry, brown, SILT	(2)	
							6"-24" Wet, brown, SILT and fine SAND	(3)	
			24/16	8-10	4-6-7-11	0.6	0-3" Wet, brown very fine SAND, trace gravel		
							3-16" Wet, loose, brown, fine SAND and SILT		
10							trace gravel		
			24/14	10-12	1/12"-11-12	0.4	0-7" Wet, brown, fine to coarse SAND, trace		
							gravel		
							7-10" Wet, brown medium to coarse SAND		
15							10-14" Wet, gray and rust mottled SILT		
							trace gravel		
			24/24	12-14	16-13-13-13	0.2	0-10" Wet, loose, brown fine SAND and SILT		
							trace gravel		
20							10-24" Wet, loose, brown fine SAND, little		
							silt, little gravel		
			24/17	14-16	2-8-12-13	0.1	0-4" Wet, loose, brown fine SAND		
							4-7" Wet, loose, brown fine to medium SAND		
25							7-17" Wet, loose brown fine to medium SAND		
							some gravel		
			24/24	16-18	25-33-32		0-10" Wet, brown medium SAND		
					50/1"		10-19" Wet, brown, SILT and gray ROCK frags	(4)	
30							19-24" Wet. Brown, SILT and ROCK frags		
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
(1) First spoon sampled collected 4-6 ft bgs
(2) Analytical samples collected form 6-8 feet bgs
(3) Groundwater at 7 ft bgs
(4) Weathered/tight. Refusal at 18.5 ft. Monitoring well sceen set at 13.5-18.5 ft bgs

SPD-MW-400D monitoring well installed at this location

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-400D

Weston & Sampson

PROJECT
Medfield State Hospital
Medfield, MA
(Salvage Yard)

REPORT OF BORING No. SPD-SB-401D
SHEET 1 OF 1
Project No. 2110036.D
CHKD BY

BORING Co. Geologic
FOREMAN Dave/Ray & Justin
WSE GEOLOGIST: Emily Faivre & Rebecca Mauser

BORING LOCATION See attached plan
GROUND SURFACE ELEV. DATUM
DATE START 4/21/11 DATE END 4/22/11

SAMPLER: Drive & Wash
CASING:
CASING SIZE: N/A Method Direct push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			24/10	0-2	8 - 7	1.3	0-5" dark brown, dry, topsoil, loamy, silty organic		
					10 - 19		5-10" light brown, rock fragments w/ gravel loam, silt		
5			24/12	4-6	36 - 28	0.1	0-7" light brown, wet*, medium/coarse sand trace gravel		
					36 - 37		7-12" light brown, wet*, medium sand, some gravel		
			24/17	6-8	49 - 82	0.2	0-5" coarse sand & gravel **		
10					94 - 25		5-8" light brown, wet, fine to medium sand little gravel		
							8-14" light brown/orange tint, wet, fine to medium sand, little gravel, trace silt		
							14-17" rock fragment/dust, white/gray		
15			17/15	8-10	32 - 40	0.4	0-9" light brown, wet, medium to coarse sand little gravel		
					100/5"		9-15" light brown, wet, fine to medium sand trace silt & gravel		
			24/15	10-12	21 - 57	0.5	0-15" light brown, wet, medium to coarse sand trace silt & gravel		
20					48 - 35				
			24/22	12-14	43 - 37	1.1	0-10" light brown, wet, medium coarse sand trace silt & gravel		
					50 - 42		10-12" light brown, wet, fine sand & silt		
							12-14" light brown, wet, fine sand, little silt		
25							14-22" light brown, wet, silt, trace sand & gravel		
			8/17	14-16	50 -	4.1	0-5" light brown, wet, silt, trace sand & gravel		
					50/2"		5-17" light brown, wet, till (sand, medium to coarse sand, trace gravel) - losely packed		
			17/16	16-18	54 - 47	1.1	0-17" light brown, wet, till (fine sand & silt, trace gravel) - losely packed		
30					50/5"				
			11/7	18-20	21 -	7.6	0-7" light brown, wet, till (fine sand, trace silt & gravel) - tightly packed		
					50/5"				
			9/9	20-22	43 -	0.6	0-9" light brown, wet, fine to medium sand little silt & gravel		
					50/3"				
			13/7	22-24	14 - 55	0.4	0-4" light brown, wet, fine to medium sand little silt & gravel		
					50/1"				
							4-7" light brown, wet, till (fine sand, trace silt & gravel) - tightly packed		
			9/9	24-26	40 -	1.1	0-9" light brown, wet, till (fine sand, trace silt & gravel) - tightly packed		
					50/3"				
			3/3	26-28	50/3"	0.9	0-3" light brown, wet, till (fine sand, trace silt & gravel) - tightly packed		
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
(1) wet* due to drive & wash technique, not water table
(2) Sample taken at 8-10 ft bgs @ 1300
(3) Bent 2 spoons at 10-12 & 12-14 ft, using larger spoon for remainder of well
(4) At 14-16 ft, drilling using 300lb weight instead of 140lb - counts are at 50 instead of 100
(5) **Drive & Wash Technique introduced a layer of coarse sand & gravel
(6) Set Screen at 23-28 ft
(7) New Driller (Ray) at 24-26 ft
SPD-MW-401D monitoring well installed at this location

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-401D

Weston & Sampson

PROJECT
Medfield State Hospital
Medfield, MA
(Salvage Yard)

REPORT OF BORING No. SPD-SB-401S
SHEET 1 OF 1
Project No. 2110036.D
CHKD BY

BORING Co. Geosearch
FOREMAN Joe and Artie
WSE GEOLOGIST: Emily Faivre

BORING LOCATION See attached plan
GROUND SURFACE ELEV. DATUM
DATE START 6/28/11 DATE END 6/28/11

SAMPLER: Hollow Stem Augers
CASING:
CASING SIZE: N/A Method Direct push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			24/14	0-2	1-1-1-1	0.6	0-14" Dry, loose, dark brown to brown topsoil		
			24/11	2-4	1-2-1-4	0	0-11" Dry, medium brown SILT, trace fine sand		
5			24/13	4-6	6-20-15-19	0	0-2"Dry, dark brown topsoil (fall in) 2-13" Dry, light brown fine to coarse SAND and GRAVEL		
			3/2	6-8	50/3"	0	0-2" Dry, light gray rock dust and frags		
10			24/1	8-10	12-34-24-18	1	0-1" Damp, rock frags, crushed rock dust		
			24/10	10-12	20-22-11-9	0	0-3" Wet, slate rock frags 3-10" Wet, brown GRAVEL	(1) (2)	
15			24/19	12-14	10-9-5-7	0	0-8" Wet, brown, GRAVEL, trace fine to coarse sand 8-12" Wet, brown, fine SAND trace gravel 12-14" Wet brown, medium SAND 14-19' Wet, brown, medium SAND		
20			24/24	14-16	10-25-35-36	0.1	0-11" Wet, brown, fine to coarse SAND 11-15" Wet, brown TILL 15-24" Wet, brown SILT trace gravel		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
(1) Groundwater at 10 ft bgs. No samples collected due to lack of sample volume in spoon
(2) Sample collected form 10-12 ft bgs for VOCs 8260 and % solids @ 1230

SPD-MW-401S monitoring well installed at this location

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-401S

Weston & Sampson

PROJECT: Medfield State Hospital, Medfield, MA (Salvage Yard)

REPORT OF BORING No. SY-SB-100

SHEET 1 OF 1

Project No. 2090511.A

CHKD BY LMD

BORING Co. New England Geotech

FOREMAN Steve

WSE GEOLOGIST: Emily Faivre

BORING LOCATION See attached plan

GROUND SURFACE ELEV. ____ DATUM ____

DATE START 11/12/09 DATE END 11/12/09

SAMPLER: Geoprobe 6620DT Track Rig

CASING: ____

CASING SIZE: N/A Method Direct push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			60/12	0-5		0	0 - 12" Brown to dark brown fine SAND and trace GRAVEL		
			60/0	5-10		0		(1)	
			60/18	10-15		0	0 - 2" Dark brown fine SAND little GRAVEL		
5							2 - 18" Tan fine SAND trace GRAVEL		
			60/36	15-20		0	0 - 6" Dark brown fine SAND	(2)	
							6 - 7" Gray GRAVEL		
							7 - 15" Tan fine SAND little SILT		
							15 - 36" Tan SILT little fine SAND		
10			60/60	20-25		0	0 - 2" Dark brown fine to medium SAND		
							2 - 24" Tan fine SAND trace GRAVEL	(3)	
							24 - 32" Tan SILT little GRAVEL		
							32 - 35" Tan and green SILT some fine SAND		
15							35 - 60" Tan SILT some fine SAND trace GRAVEL		
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

(1) Driller's comment: Concrete blocks limiting quantity of sample collected.

(2) Sample collected 19-21 bgs for CAM-14 metals, asbestos by PLM, PCBs, EPH w/ targets and VPH w/ targets

(3) Refusal at 25'

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. PP-SB-100

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-500

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN

WSE GEOLOGIST: PK & JS

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 1/25/12 DATE END 1/25/12

SAMPLER: Geoprobe 6620DT

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			48/60	0-5		0	0-60" Top soil undrlain by brown fine to medium SAND and SILT underlain by light brown fine SILT SAND with some GRAVEL at 4-5'		
5			50/60	5-10		0	60"-120" Brown to gray fine to medium SAND with SILT GRAVEL and broken ROCK FRAGMENTS underlain by fine SILT and SAND with some GRAVEL		
10			36/60	10-15		0	120"-180" Brown to gray tight fine SILT SAND. Wet at 10'. Saturated at 15'		
15									
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Refusal (with casing) at 15.5'

Well set at 15.5'

Sample taken at 10-15 ft for VOCs 8260

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-500

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-501

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN

WSE GEOLOGIST: PK & JS

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 1/26/12 DATE END 1/26/12

SAMPLER: Geoprobe 6620DT

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			30/60	0-5		0	0-60" Top Soil underlain by light brown fine SILT and SAND with some GRAVEL		
5			30/60	5-10		0.4	60"-120" Light brown to tan fine SILT and SAND with GRAVEL. Wet at 8'-10'.		
10			50/60	10-15		0.2	120"-180" Light brown to gray fine SILT SAND with GRAVEL		
15									
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Refusal (with casing) at 14.5'.
Well set at 14.5'

Sample taken at 10-15 ft for VOCs 8260
DUP-1 taken at 10-15 ft for VOCs 8260

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-501

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-502

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN

WSE GEOLOGIST: PK & JS

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 1/26/12 DATE END 1/26/12

SAMPLER: Geoprobe 6620DT

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			48/60	0-5		0.2	0-6" Top Soil underlain by brown to gray fine SILT and SAND with GRAVEL and broken ROCK FRAGMENTS from 6" to 60" Wet at 2-5'		
5			45/60	5-10		0.1	60"-120" Light brown to gray fine SILT and SAND with GRAVEL and broken ROCK FRAGMENTS. Saturated 4'-9'		
10			55/60	10-15		0.1	120"-144" Light brown fine to medium SAND and GRAVEL. Saturated 144"-156" Light brown fine SILT and SAND underlain by weathered ROCK at 12.5 -13'		
15									
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Refusal (with casing) at 13'.

Well set at 13'

Sample taken at 5-10 ft for VOCs 8260

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-502

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-503

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN

WSE GEOLOGIST: PK & JS

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 1/24/12 DATE END 1/24/12

SAMPLER: Geoprobe 6620DT

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			24/60	0-5		0	0-60" Brown fine to medium SAND with SILT and some GRAVEL		
5			24/60	5-10		0	60"-120" Light brown fine SILT and SAND and broken ROCK FRAGMENTS		
10			30/60	10-15		0	120"-180" Brown to gray fine SILT and SAND with GRAVEL and broken ROCK FRAGMENTS. Wet at 12'		
15			48/60	15-20		0	180"-240" Gray to brown fine to medium SAND and SILT with gravel and broken ROCK FRAGMENTS underlain by fine SILT SAND at 18'-20'. Saturated.		
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Sample taken at 10-15 ft for VOCs 8260

Well set at 20'

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-503

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-504

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN

WSE GEOLOGIST: PK & JS

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 1/24/12 DATE END 1/24/12

SAMPLER: Geoprobe 6620DT

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			40/60	0-5		0	0-60" Top soil undrlain by light brown fine to medium SAND and SILT with GRAVEL and broken ROCK FRAGMENTS		
5			48/60	5-10		0	60"-120" Brown to gray fine to medium SILT and SAND with broken ROCK FRAGMENTS		
10			48/60	10-15		0	120"-180" Brown to gray fine to medium SILT and SAND with GRAVEL and broken ROCK FRAGMENTS Moist to wet at 12' Dry below		
15			30/60	15-20		0	180"-240" Brown to gray till with fine to medium SAND SILT GRAVEL and broken ROCK FRAGMENTS. Moist at 20'. 20'		
20			36/60	20-23		0	240"-276" Hole collapsing.Gray fine to medium SAND with GRAVEL underlain by light brown SILT SAND and GRAVEL moist to wet.		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Refusal at 23'. Well set at 23'

Sample taken at 15-20 ft for VOCs 8260

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-504

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-505

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN

WSE GEOLOGIST: PK & JS

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 1/24/12 DATE END 1/24/12

SAMPLER: Geoprobe 6620DT

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			48/60	0-5		0	0-60" Dark brown fine SILT and SAND underlain by light brown fine SAND and with some GRAVEL and broken ROCK FRAGMENTS. Wet at 3'.		
5			60/60	5-10		0	60"-120" Brown fine SILT and SAND underlain by medium to coarse SAND and GRAVEL underlain by fine brown SAND and SILT. Saturated		
10									
15									
20									
25									
30									
35									

GRANULAR SOILS BLOWS/FT	GRANULAR SOILS DENSITY	COHESIVE SOILS BLOWS/FT	COHESIVE SOILS DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Well set at 12'.

Sample taken at 0-5 ft for VOCs 8260

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-505

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-506

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN

WSE GEOLOGIST: PK & JS

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 1/25/12 DATE END 1/25/12

SAMPLER: Geoprobe 6620DT

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			48/60	0-5		0	0-60" Dark brown to black fine SILT and SAND underlain by light brown SAND and SILT with some GRAVEL underlain by gray SILT and SAND at 5'. Wet at 3'-4'		
5			60/60	5-10		0	60"-120" Brown to orange fine SILT and SAND with some GRAVEL underlain by Gray fine SILT and SAND		
10									
15									
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Well set at 11'.

Sample taken at 0-5 ft for VOCs 8260

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-506

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-507

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN

WSE GEOLOGIST: PK & JS

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 1/25/12 DATE END 1/25/12

SAMPLER: Geoprobe 6620DT

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			40/60	0-5		0	0-60" Dark brown fine to medium SAND and SILT underlain by light brown fine		
							fine SILT and SAND underlain by brown		
							tight SILT and SAND with GRAVEL and		
							broken ROCK FRAGMENTS from 4-5'		
5			30/60	5-10		0.1	60"-120" Light brown fine SILT and SAND		
							with GRAVEL underlain by brown to		
							gray medium to fine SAND SILT GRAVEL		
							GRAVEL and broken ROCK		
							from 8-10'		
10			48/60	10-15		0.1	120"-180" Light brown medium SAND and		
							and GRAVEL with broken ROCK		
							FRAGMENTS		
							wet at 14'		
15			36/60	15-20		0	180"-240" Light brown to gray fine to		
							to medium SAND with GRAVEL SILT		
							and broken ROCK FRAGMENTS		
							Saturated		
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Refusal (with casing) at 14'.

1" well is set at 20'

Sample taken at 10-15 ft for VOCs 8260

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-507

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-508

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN

WSE GEOLOGIST: PK & JS

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 1/24/12 DATE END 1/24/12

SAMPLER: Geoprobe 6620DT

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			40/60	0-5		0	0-60" Dark brown fine SILT and SAND underlain by gray to brown medium to coarse SAND. Wet at 4'.		
5			48/60	5-10		0	60"-120" Brown to tan medium to coarse SAND and SILT with some GRAVEL undrlain by brown fine SILT and SAND Saturated at 6'		
10									
15									
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Well set at 12'.

Sample taken at 5-10 ft for VOCs 8260

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-508

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-509

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN

WSE GEOLOGIST: PK & JS

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 1/25/12 DATE END 1/25/12

SAMPLER: Geoprobe 6620DT

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			48/60	0-5		0.4	0-4" Dark brown fine SILT and SAND with GRAVEL and some organics 4"-8" Coal or coal cinder (black) 8"-60" Light brown fine SILT and SAND Saturated 4'-5'.		
5			24/60	5-10		0	60"-120" Light brown fine SILT and SAND SAND underlain by gray fine to medium SAND SILT and GRAVEL with broken ROCK FRAGMENTS (9'-10').		
10									
15									
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Well set at 12'

Sample taken at 0-5 ft for VOCs 8260

Sample taken at 1-3 ft for EPH with target PAHs and CAM 14 Metals

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-509

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-510

SHEET 1 OF 1

Project No.

CHKD BY

BORING Co. New England Geotech

FOREMAN

WSE GEOLOGIST: PK & JS

BORING LOCATION See attached plan

GROUND SURFACE ELEV. DATUM

DATE START 1/25/12 DATE END 1/25/12

SAMPLER: Geoprobe 6620DT

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			36/36"	0-3		0	0-6" Top soil with dark brown to black GRAVEL and some ORGANIC material 6" to 3' Light brown fine SILT and SAND		
5									
10									
15									
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

End of boring at 3'

Sample taken 1-3' for EPH with target PAHs and Cam14 Metals

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-510

Weston & Sampson	PROJECT	REPORT OF BORING No. SPD-SB-600 SHEET 1 OF 2 Project No. 2110036 CHKD BY

BORING Co.	New England Geotech	BORING LOCATION	See attached plan		
FOREMAN	Hayes	GROUND SURFACE ELEV.	195.7	DATUM	
WSE GEOLOGIST:	Rebecca Mauser	DATE START	7/30/13	DATE END	7/30/13

SAMPLER:

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
7/30/2013		13'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (ft)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
0-5'			5/3			0	0-17" Medium Brown Sandy Topsoil 17-26" Light Brown/Orange Fine-Medium Sand, Trace Gravel 26-36" Light Brown/Grey Fine-Medium Sand & Gravel		
5-10'			5/3.3			0	36-48" Light Brown Fine-Medium Sand, White Rock Fragments 48-71" Medium fine-Coarse Sand, Trace Silt & Gravel 71-74" Small Light Brown Vein of Clay 74-75" Medium fine-Coarse Sand, Trace Silt & Gravel		
10-15'			5/2.8			0.1	75-84" Light Brown Sand with White Rock Fragments. 84-100" Medium Brown Fine-Coarse and silt, Trace Gravel & Clay 100-103" Medium Brown Fine-Coarse Sand & Silt, Trace Gravel, Wet	Wet @ ~13' bgs	
15-20'			5/5			0.1	103-127" Medium Brown Fine-Coarse Sand, Trace Gravel, Wet 127-159" Medium Brown Fine-Coarse Sand & Silt, Trace Gravel & Clay, Tightly Packed, Wet		

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

SPD-MW-600 installed at this location
PID headspace = 0.1
Water Table @ 13'
Sample for VOC 8260 Taken @ 12-13' bgs

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-600

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-601

SHEET 1 OF 1

Project No. 2110036

CHKD BY

BORING Co.	New England Geotech	BORING LOCATION	See attached plan		
FOREMAN	Hayes	GROUND SURFACE ELEV.	191.5	DATUM	
WSE GEOLOGIST:	Rebecca Mauser	DATE START	7/30/13	DATE END	7/30/13

SAMPLER:

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
7/30/2013	9:15	11'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (ft)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			5/3			0.1	0-11" Medium Brown Fine Sandy Topsoil, Trace Silt		
							11-14" Light-Medium Brown Fine-Coarse Sand, Gravel		
							14-24" Light Brown/Orange fine Sand, Trace Silt		
							24-35" Light Brown, Fine-Coarse Sand, Trace Gravel & Silt, Light Grey Rock Fragments		
0-5'									
			5/3.7			0.1	35-41" Light Brown Fine-Medium Sand, Trace Gravel Silt		
							41-43" Rock Fragments		
							43-79" Light Brown Fine Sand & Silt, Trace Gravel & Clay, Tightly Packed	Slightly Wet @ 5ft bgs	
5-10'									
			5/3			0.1	79-97" Light Brown Fine Sand, Trace Gravel & Silt, Trace Clay, Tightly Packed		
							97-99" Rock Fragments		
							99-113" Light Brown Fine Sand & Silt, Trace Gravel, Trace Clay		
10-15'									
			5/3			0.1	113-147" Light Brown Fine Sand & Silt, Trace Gravel & Clay, Tightly Packed, Wet	Wet @ ~11ft bgs	
15-20'									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

SPD-MW-601 installed at this location

PID headspace = 0.1

Water Table @ 11'

Sample for VOC 8260 Taken @ 10-11' bgs. Above H2O Table

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-601

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-602

SHEET 1 OF 2

Project No. 2110036

CHKD BY

BORING Co. New England Geotech

FOREMAN Hayes

WSE GEOLOGIST: Rebecca Mauser

BORING LOCATION See attached plan

GROUND SURFACE ELEV. 197.8 DATUM

DATE START 7/30/13 DATE END 7/30/13

SAMPLER:

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
7/30/2013		13'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (ft)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			5/2.9			0	0-4" Pavement 4-8" Light Brown Fine-Coarse Sand, Trace Gravel 8-12" Light Brown Fine-Medium Sand, Trace Gravel 12-14" Rock Fragments 14-17" Light Brown Fine-Medium Sand, Trace Gravel 17-20" Dark Brown Fine Sand 20-30" Light Brown / Orange Fine Sand Trace Gravel & Silt 30-32" Light Brown Fine-Coarse Sand Trace Gravel		
0-5'			5/3			0	32-65" Light-Medium Brown, Fine-Coarse Sand & Silt, Trace Gravel & Clay, Tightly Packed		
5-10'			5/3			0	65-101" Light-Medium Brown Fine-Coarse Sand & Silt, Trace Gravel & Clay, Tightly Packed, Wet	Wet @ ~13' bgs	
10-15'			5/4.5			0	101-131" Light-Medium Brown, Fine-Coarse Sand & Silt, Trace Gravel & Clay, Tightly Packed, Wet. 131-133" Blue/Gray Rock Fragments 133-148" Light-Medium Brown, Fine-Coarse Sand & Silt, Trace Gravel & Clay 148-151" Blue/Gray Rock Fragments		
15-20'									

GRANULAR SOILS BLOWS/FT	GRANULAR SOILS DENSITY	COHESIVE SOILS BLOWS/FT	COHESIVE SOILS DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

SPD-MW-602 installed at this location

PID headspace = 0.0

Water Table @ 13' bgs

Sample for VOC 8260 Taken @ 12-13'

DUP-1 Taken Here

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-602

Weston & Sampson

PROJECT

REPORT OF BORING No. SPD-SB-603

SHEET 1 OF 1

Project No. 2110036

CHKD BY

BORING Co. New England Geotech

FOREMAN Hayes

WSE GEOLOGIST: Rebecca Mauser

BORING LOCATION See attached plan

GROUND SURFACE ELEV. 198.9 DATUM

DATE START 7/30/13 DATE END 7/30/13

SAMPLER:

CASING:

CASING SIZE: N/A Method

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
7/30/2013		13'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (ft)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			5/3.7			0.1	0-4" Asphalt 4-9" Medium Brown Fine-Coarse Sand, Trace Gravel 9-20" Medium Brown Fine-Medium Sand, Trace Silt 20-24" Grey Rock Fragments, Possible Red Brick Fragments, Medium Brown Fine-Coarse Sand 24-42" Light-Medium Brown Fine-Coarse Sand, Silt, Trace Gravel		
0-5'			5/4			0.1	42-91" Light-medium Brown Fine-Coarse Sand, Silt, Trace Gravel & Clay, Tightly Packed		
5-10'			5/5			0	91-148" Light-Medium Brown Fine-Coarse Sand & Silt, Trace Gravel & Clay, Tightly packed.	Wet @ ~13' bgs	
10-15'			5/2.5			0	148-171" Light-Medium Brown Fine-Coarse Sand & Silt, Trace Gravel & Clay, Tightly Packed. Wet.		
15-20'									

GRANULAR SOILS BLOWS/FT	GRANULAR SOILS DENSITY	COHESIVE SOILS BLOWS/FT	COHESIVE SOILS DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

SPD-MW-603 installed at this location

PID headspace = 0.0

Water Table @ 13' bgs

Sample for VOC 8260 Taken @ 12-13'

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-603

Weston & Sampson	PROJECT: Medfield State Hospital SPD Area	REPORT OF BORING No. SPD-SB-800
		SHEET 1 OF 5
		Project No. 2140030
		CHKD BY

BORING Co.	New England Geotech	BORING LOCATION	See attached plan
FOREMAN	Maynard	GROUND SURFACE ELEV.	DATUM
WSE GEOLOGIST:	SMM & SAR	DATE START 1/31/17	DATE END 1/31/17

SAMPLER: Geoprobe 7822DT track mounted rig
DT 22 Sampler 2.25 inch
CASING: DT 22 2.25 inch PVC liners w/o catcher

CASING SIZE: 2.25 Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			35	0-5		0.1	topsoil, organics, light brown fine to coarse sand, rock fragments (some), some silt, moist at 5'		
5			42	5-10		0.1	light brown fine to coarse sand, silt material, moist		
10			37	10-15		0.5	light brown fine to coarse sand, gravel trace rock fragments, wet, tight material		
15			40	15-20		0.2	refusal at 18', light brown fine to coarse sand, trace gravel, tight material		
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-800

Weston & Sampson	PROJECT: Medfield State Hospital SPD Area	REPORT OF BORING No. SPD-MW-801
		SHEET 2 OF 5
		Project No. 2140030
		CHKD BY

BORING Co.	New England Geotech	BORING LOCATION	See attached plan
FOREMAN	Maynard	GROUND SURFACE ELEV.	DATUM
WSE GEOLOGIST:	SMM & SAR	DATE START 1/31/17	DATE END 1/31/17

SAMPLER: Geoprobe 7822DT track mounted rig
DT 22 Sampler 2.25 inch
CASING: DT 22 2.25 inch PVC liners w/o catcher
CASING SIZE: 2.25 Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			35	0-5		0.3	organics, fine to coarse brown sand, gravel, trace rock fragments, trace brick fragments, coal at 4-5'		
5			35	5-10		0.2	brown to light brown silty fine to coarse sand 5-7 wet at 7' 7-10' silty sand		
10			24	10-15		0.2	light brown fine to coarse sand, silty		
15			-	15-20		-	no sample but drive to 19' for well		
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
set well @ 19
screen 19'-5'
stick up well
14' of screen

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-MW-801

Weston & Sampson

PROJECT
Medfield State Hospital SPD Area

REPORT OF BORING No. SPD-SB-802
SHEET 3 OF 5
Project No. 2140030
CHKD BY

BORING Co. New England Geotech
FOREMAN Maynard
WSE GEOLOGIST: SMM & SAR
BORING LOCATION See attached plan
GROUND SURFACE ELEV. DATUM
DATE START 1/31/17 DATE END 1/31/17

SAMPLER: Geoprobe 7822DT track mounted rig
DT 22 Sampler 2.25 inch
CASING: DT 22 2.25 inch PVC liners w/o catcher
CASING SIZE: 2.25 Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			55	0-5		0.3	brown fine to coarse silty sand, trace gravel		
5			51	5-10		0.3	light brown fine to coarse sand, silty sand wet at ~ 6'		
10			50	10-15		0.2	light brown fine to coarse sand, gravel silty sand, trace rock fragments		
15			54	15-20			15-17' - light brown fine to coarse sand 17-20' - silty sand tight till gravel		
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
set well at 17'
screen 17-4'

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-802

Weston & Sampson

PROJECT: Medfield State Hospital SPD Area

REPORT OF BORING No. SPD-SB-803
SHEET 4 OF 5
Project No. 2140030
CHKD BY

BORING Co. New England Geotech
FOREMAN Maynard
WSE GEOLOGIST: SMM & SAR
BORING LOCATION See attached plan
GROUND SURFACE ELEV. DATUM
DATE START 1/31/17 DATE END 1/31/17

SAMPLER: Geoprobe 7822DT track mounted rig
DT 22 Sampler 2.25 inch
CASING: DT 22 2.25 inch PVC liners w/o catcher
CASING SIZE: 2.25 Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			37	0-5		0	light brown fine to coarse sand, gravel, rock fragments, wet at 5'		
5			35	5-10		0.1	light brown fine to coarse sand, rock, gravel, moist, tight material		
10			26	10-15			refusal at 11' light brown fine to coarse sand, gravel, trace rock fragments, wet		
15			38	15-20			refusal at 19' light brown fine to coarse sand, wet, gravel		
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
well set at 18'
screen 18-8
sample SPD MW 803 (5-10') at 14:45

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-803

Weston & Sampson

PROJECT: Medfield State Hospital SPD Area

REPORT OF BORING No. SPD-SB-804
SHEET 5 OF 5
Project No. 2140030
CHKD BY

BORING Co. New England Geotech
FOREMAN Maynard
WSE GEOLOGIST: SMM & SAR
BORING LOCATION See attached plan
GROUND SURFACE ELEV. DATUM
DATE START 1/31/17 DATE END 1/31/17

SAMPLER: Geoprobe 7822DT track mounted rig
DT 22 Sampler 2.25 inch
CASING: DT 22 2.25 inch PVC liners w/o catcher
CASING SIZE: 2.25 Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	PEN/REC (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			38	0-5		0.4	top 1 foot organics		
							fine to coarse brown silty sand		
							gravel		
5			43	5-10		0.5	light brown fine to coarse silty sand,		
							gravel, trace rock fragments, wet at 5		
							feet		
10							tight material		
			47	10-15		0.5	light brown sand fine to coarse silty		
							sand, trace gravel, trace rock fragments		
15			25	15-20		0.5	light brown fine to coarse silty sand,		
							trace gravel		
							wet at 7'		
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
well set at 20 '
screen 20-10
sample SPD MW 804 (5-20') at 11:30

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SPD-SB-804

Weston & Sampson	PROJECT Medfield State Hospital	REPORT OF BORING No. SB-E7 SHEET 1 OF 1 Project No. 2190387 CHKD BY SMM	

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan		
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A	DATUM	N/A
WSE REP	Taylor Smith	DATE START	6/3/19	DATE END	6/3/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		8'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	35/60	0-5	N/A	0	Dark brown, fine to medium SAND, some gravel		FILL
							Rock		
							Light brown, fine to medium SAND, some gravel, iron staining on water table		SAND
5		S-2	43/60	5-10	N/A	0			
10		S-3	40/60	10-15	N/A	0	Light brown, fine SAND, pockets of blue clay and dark brown medium to coarse sand, rock		
15							Brown medium to coarse SAND		
		S-4	52/60	15-20	N/A	0			
						0	Very dense, brown fine to coarse SAND and GRAVEL (till) Refusal @ 21.5'		TILL
20		S-5	8/60	20-21.5	N/A	0			
							EOB @ 21.5		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

sample 20-21.5' @ 11:15

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-E7

Weston & Sampson

PROJECT: Medfield State Hospital

REPORT OF BORING No. SB-B4

SHEET 1 OF 1

Project No. 2190387

CHKD BY SMM

BORING Co. New England Geotech

FOREMAN Maynor

WSE REP Taylor Smith

BORING LOCATION See attached site plan

GROUND SURFACE ELEV. N/A DATUM N/A

DATE START 6/3/19 DATE END 6/3/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		6'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	36/60	0-5	N/A	0	Dark brown, fine to medium SAND		SAND
							Fractured rock		ROCK
5		S-2	43/60	5-10	N/A	0	Brown, fine to medium SAND, gravel, pockets of clay		
10		S-3	35/60	10-15	N/A	0			SAND
						0	Brown, fine to coarse SAND, gravel		
15		S-4	60/60	15-20	N/A	0			
						0			
20		S-5	2/60	20-21	N/A	0	Very dense, brown, fine to medium SAND Refusal @ 21'		
							EOB @ 21		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Very rocky, some iron staining on water table

sample 20-21 @ 14:15

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-B4

Weston & Sampson	PROJECT: Medfield State Hospital	REPORT OF BORING No. SB-B2
		SHEET 1 OF 1
		Project No. 2190387
		CHKD BY SMM

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A DATUM N/A
WSE REP	Taylor Smith	DATE START 6/3/19	DATE END 6/3/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		7'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	37/60	0-5	N/A	38700	Brown, fine to medium SAND, rock, trace gravel		SAND
5		S-2	57/60	5-10	N/A	0	Brown, fine to coarse SAND, fractured rock and gravel		
10		S-3	48/60	10-15	N/A	103	Brown, fine to medium SAND, trace gravel		
15		S-4	36/36	15-18	N/A	370	Very dense, brown, fine to coarse SAND, trace gravel Refusal @ 20'		
20		S-5	24/24	18-20	N/A	0			
25							EOB @ 20		
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

sample 0-2.5' @ 15:00; sample 15-18' @ 15:45

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-B2

Weston & Sampson

PROJECT	REPORT OF BORING No.	SB-C6
Medfield State Hospital	SHEET 1 OF 1	
	Project No.	2190387
	CHKD BY	SMM

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A DATUM N/A
WSE REP	Taylor Smith	DATE START 6/4/19	DATE END 6/4/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		~8'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	42/60	0-5	N/A	140	Dark brown, fine to medium SAND, some gravel, trace roots		SAND
5		S-2	34/60	5-10	N/A	399	Light brown, fine SAND, trace gravel		
							Fractured rock		ROCK
10		S-3	57/60	10-15	N/A	993	Brown to gray, fine to medium SAND, trace gravel		SAND
15							Brown, fine to coarse SAND, some gravel		
		S-4	36/36	15-18	N/A	3640	Brown, medium to coarse SAND		
20		S-5	--	18-20	N/A	452	Very dense, brown, fine to medium SAND, some gravel Refusal @ 20'		
25							EOB @ 20		
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

sample 18-20' @ 10:10; 15-18' @ 10:45; 8-10' @ 11:00

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-C6

Weston & Sampson

PROJECT: Medfield State Hospital

REPORT OF BORING No. SB-C5

SHEET 1 OF 1

Project No. 2190387

CHKD BY SMM

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A DATUM N/A
WSE REP	Taylor Smith	DATE START 6/11/19	DATE END 6/11/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		7'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	26/60	0-5	N/A	530	Dark brown, fine to medium SAND, some gravel, roots		
						0			
5							Brown, fine to coarse SAND and fractured rock		
		S-2	46/60	5-10	N/A	0	Tan fine to coarse SAND, gravel		
							Fractured rock		
10							Brown, fine SAND, trace gravel		SAND
		S-3	37/60	10-15	N/A	0			
15							Brown, fine to coarse SAND		
		S-4	35/60	15-20	N/A	1539			
						0	Brown fine to medium SAND, gravel, fractured rock		
20									
		S-5	--/36	20-23	N/A	0	Stuck in sleeve, refusal @ 23'		
							EOB @ 23		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

sample 0-2.5' @ 12:00; 15-17.5' @ 12:30; 17.5-20' @ 12:35; 8-10' @ 12:45

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-C5

Weston & Sampson	PROJECT	REPORT OF BORING No.	SB-C3
	Medfield State Hospital	SHEET 1 OF 1	
		Project No.	2190387
		CHKD BY	SMM

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan		
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A	DATUM	N/A
WSE REP	Taylor Smith	DATE START	6/11/19	DATE END	6/11/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		7'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	38/60	0-5	N/A	26300	Brown fine SAND		FILL
							Greenish fine SAND		
						0			
5									
		S-2	25/60	5-10	N/A	1056	Brown fine to medium SAND, fractured rock GW @ 7'		
10									
		S-3	40/60	10-15	N/A	2387			SAND
							Brown, fine to coarse SAND, some gravel		
15						783			
		S-4	--	15-18	N/A				
						280	Very dense, brown fine SAND and GRAVEL		
20							EOB @ 18		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

sample 0-2.5' @ 14:15; 15-16.5' @ 14:45; 16.5-18' @ 14:50

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-C3

Weston & Sampson℠

PROJECT	REPORT OF BORING No.	SB-D5
Medfield State Hospital	SHEET 1 OF 1	
	Project No. 2190387	
	CHKD BY SMM	

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan
FOREMAN	Maynor	GROUND SURFACE ELEV. N/A	DATUM N/A
WSE REP	Taylor Smith	DATE START 6/5/19	DATE END 6/5/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		~11'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	41/60	0-5	N/A	3183	Brown, fine to medium SAND, brick, fractured rock		FILL
						1090	Brown to orange fine SAND		SAND
5		S-2	56/60	5-10	N/A	0	Fractured rock		ROCK
							Brown fine to coarse SAND, trace gravel		SAND
10		S-3	50/60	10-15	N/A	1422			
							Brown fine to medium SAND, some gravel		
15		S-4	48/60	15-20	N/A	31			
						159	Very dense, brown fine to medium SAND, some gravel		
20									
							EOB @ 20		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

GW well set at 20', screened 10-20'

GW sample @ 11:30

GW screened - 0ppb

sample 16-20' @ 09:30

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-D5

Weston & Sampson

PROJECT	REPORT OF BORING No.	SB-E5
Medfield State Hospital	SHEET 1 OF 1	
	Project No.	2190387
	CHKD BY	SMM

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A DATUM N/A
WSE REP	Taylor Smith	DATE START 6/5/19	DATE END 6/5/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		~12'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	32/60	0-5	N/A	6749	Brown fine to coarse SAND, gravel, brick, concrete		FILL
5		S-2	50/60	5-10	N/A	0	Brown fine to coarse SAND, some gravel, fractured rock		
10		S-3	25/60	10-15	N/A	2587	Brown fine to coarse SAND, fractured rock and brick		
15		S-4	35/60	15-20	N/A	99	Brown fine to medium SAND, gravel		SAND
						253			
20							Dense, brown to gray, fine SAND	*	
							EOB @ 20		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
* refusal @ 20'
GW well set at 20', screened 10-20'
GW sample @ 12:45
Screened GW - 0ppb

sample 10-12' @ 10:45; 19-20' @ 10:55

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-E5

Weston & Sampson

PROJECT: Medfield State Hospital

REPORT OF BORING No. SB-F6

SHEET 1 OF 1

Project No. 2190387

CHKD BY SMM

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A DATUM N/A
WSE REP	Taylor Smith	DATE START	6/5/19 DATE END 6/5/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		~12'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	41/60	0-5	N/A	1130	Dark brown fine to medium SAND, brick, fractured rock		FILL
5		S-2	46/60	5-10	N/A	1191	Light brown to orange, fine SAND, gravel		
10		S-3	35/60	10-15	N/A	42000	Brown fine to coarse SAND, gravel, fractured rock		SAND
15		S-4	45/60	15-20	N/A	1626	Brown to gray fine to coarse SAND, gravel		
20						15000	Dense, brown to gray fine SAND, gravel Refusal @ 20'		
25							EOB @ 20		
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

GW well set at 20', screened 10-20'

GW sample @ 13:45

Screened GW - 471ppm

sample 10-12' @ 12:20; 18-20' @ 12:30

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-F6

Weston & Sampson	PROJECT: Medfield State Hospital	REPORT OF BORING No. SB-G7
		SHEET 1 OF 1
		Project No. 2190387
		CHKD BY SMM

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan		
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A	DATUM	N/A
WSE REP	Taylor Smith	DATE START	6/5/19	DATE END	6/6/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		~15'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	39/60	0-5	N/A	595	Brown fine to coarse SAND, gravel		FILL
							Orange to brown fine SAND		
						112	Brown fine to coarse SAND, gravel		SAND
5		S-2	60/60	5-10	N/A	0			
							Brown fine to medium SAND, gravel		
						0			
10		S-3	43/60	10-15	N/A	0			
15							Brown fine to coarse SAND, gravel		
		S-4	36/36	15-18	N/A	112			
							Fractured rock		ROCK
							Dense, brown fine SAND		SAND
20							EOB @ 18		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

GW well set at 20', screened 10-20'

GW sample @ 09:15 on 6/6/19

Screened GW - 441ppm

sample 13-15' @ 14:30; 17-18' @ 14:45

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-G7

Weston & Sampson	PROJECT Medfield State Hospital	REPORT OF BORING No. SB-E10 SHEET 1 OF 1 Project No. 2190387 CHKD BY SMM	

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan		
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A	DATUM	N/A
WSE REP	Taylor Smith	DATE START	6/6/19	DATE END	6/6/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		14'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	50/60	0-5	N/A	0	Asphalt		FILL
							Brown fine to medium SAND, gravel		
							Orange to gray fine SAND, trace gravel		
5									
		S-2	60/60	5-10	N/A	0	Brown fine to medium SAND, some gravel		SAND
10									
		S-3	54/60	10-15	N/A	0	Brown fine to coarse SAND, gravel		
15									
		S-4	53/60	15-20	N/A	57			
							Fractured rock		ROCK
20							Very dense, gray to brown, fine to medium SAND		SAND
							EOB @ 20		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

GW well set at 20', screened 10-20'

GW sample @ 11:15

Screened GW - 0ppb

sample 12-14' @ 09:30; 19-20' @ 09:45

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-E10

Weston & Sampson

PROJECT: Medfield State Hospital

REPORT OF BORING No. SB-C11

SHEET 1 OF 1

Project No. 2190387

CHKD BY SMM

BORING Co. New England Geotech

FOREMAN Maynor

WSE REP Taylor Smith

BORING LOCATION See attached site plan

GROUND SURFACE ELEV. N/A DATUM N/A

DATE START DATE END

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		~9'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	52/60	0-5	N/A	0	Dark brown fine SAND		SAND
							Orange to brown fine SAND		
							Brown fine SAND, fractured rock		
5									
		S-2	50/60	5-10	N/A	0	Brown fine to coarse SAND, fractured rock, gravel		
							Brown fine SAND		
10									
		S-3	48/60	10-15	N/A	18	Brown fine to medium SAND, some gravel		
15									
		S-4	60/60	15-20	N/A	220			
							Very dense, brown fine to medium SAND, gravel; refusal @ 20'		
20									
							EOB @ 20		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

GW well set at 19', screened 9-19'

GW sample @ 12:15

Screened GW - 0ppb

sample 7-9' @ 11:30; 19-20' @ 11:45

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-C11

Weston & Sampson	PROJECT Medfield State Hospital	REPORT OF BORING No. SB-D4 SHEET 1 OF 1 Project No. 2190387 CHKD BY SMM	

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan		
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A	DATUM	N/A
WSE REP	Taylor Smith	DATE START	6/6/19	DATE END	6/6/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		~11'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	0/60	0-5	N/A	--	No recovery, hit foundation or concrete object?		--
5		S-2	38/60	5-10	N/A	374	Concrete		CONCRETE
							Brown fine to medium SAND, trace gravel		SAND
10		S-3	54/60	10-15	N/A	0			
15							Brown fine to coarse SAND, gravel		
		S-4	60/60	15-20	N/A	261			
20							Dense, brown fine to medium SAND, gravel; refusal @ 20'		
							EOB @ 20		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
GW well set at 20', screened 10-20'
GW sample @ 14:00
Screened GW - 367ppb

sample 9-11' @ 12:45; 19-20' @ 13:00

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-D4

Weston & Sampson

PROJECT: Medfield State Hospital

REPORT OF BORING No. SB-E3

SHEET 1 OF 1

Project No. 2190387

CHKD BY SMM

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A DATUM N/A
WSE REP	Taylor Smith	DATE START	6/6/19 DATE END 6/7/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		~7'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	52/60	0-5	N/A	3070	Brown to gray medium SAND & BRICK		FILL
5		S-2	45/60	5-10	N/A	308	Brown fine to medium SAND, some gravel		SAND
10		S-3	52/60	10-15	N/A	0			
15						106	Brown fine to coarse SAND, gravel		
		S-4	36/60	15-20	N/A		Refusal @ 20'		
20									
							EOB @ 20		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

GW well set at 20', screened 5-20'

GW sample on 6/7/19 @ 09:30

Screened GW - 0ppb

sample 5-7' @ 14:15; 19-20' @ 14:30

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-E3

Weston & Sampson

PROJECT: Medfield State Hospital

REPORT OF BORING No. SB-G5

SHEET 1 OF 1

Project No. 2190387

CHKD BY SMM

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A DATUM N/A
WSE REP	Taylor Smith	DATE START 6/7/19	DATE END 6/7/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		15'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	32/60	0-5	N/A	123	Orange to brown fine SAND		
5		S-2	60/60	5-10	N/A	0	Brown fine to medium SAND, gravel, fractured rock		
10		S-3	58/60	10-15	N/A	0			
15		S-4	43/60	15-20	N/A	0	Fine to coarse SAND, some gravel		
20							Very dense, brown to gray, fine to medium SAND; refusal @ 19.5'		
25							EOB @ 19.5		
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

GW well set at 19', screened 9-19'

GW sample @ 11:00

Screened GW - 103ppb

sample 13-15' @ 10:00; 19-20' @ 10:15

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-G5

Weston & Sampson	PROJECT Medfield State Hospital	REPORT OF BORING No. SB-F7 SHEET 1 OF 1 Project No. 2190387 CHKD BY SMM	

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan		
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A	DATUM	N/A
WSE REP	Taylor Smith	DATE START	6/7/19	DATE END	6/7/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		--		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	46/60	0-5	N/A	128	Asphalt		
5							Brown fine to medium SAND, some gravel		FILL
		S-2	51/60	5-10	N/A	72			
10							Brown fine to coarse SAND, some gravel		
		S-3	58/60	10-15	N/A	1206			SAND
15									
		S-4	40/60	15-18	N/A	87	Dark brown fine to medium SAND, gravel Refusal @ 18'		
20							EOB @ 18		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

No groundwater

sample 14-16' @ 11:50; 17-18' @ 11:45

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-F7

Weston & Sampson

PROJECT

Medfield State Hospital

REPORT OF BORING No. SB-E6

SHEET 1 OF 1

Project No. 2190387

CHKD BY SMM

BORING Co.	New England Geotech	BORING LOCATION	See attached site plan		
FOREMAN	Maynor	GROUND SURFACE ELEV.	N/A	DATUM	N/A
WSE REP	Taylor Smith	DATE START	6/7/19	DATE END	6/7/19

SAMPLER: Track-mounted Geoprobe

CASING: 2.25 inch with PVC liners w/o catcher

CASING SIZE: 4.25 inch Method Direct Push

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
		12'		

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
		S-1	42/60	0-5	N/A	723	Asphalt		
							Dark brown fine to medium SAND, concrete, brick		FILL
5									
		S-2	48/60	5-10	N/A	532	Fine to medium SAND, gravel		
10									
		S-3	48/60	10-15	N/A	24000	Brown fine to coarse SAND, some gravel		SAND
15									
		S-4	48/60	15-20	N/A	30000			
							Brown fine to medium Refusal @ 20'		
20									
							EOB @ 20		
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

GW well set at 20', screened 10-20'

GW sample @ 13:00

Screened GW - 23ppm

sample 10-12' @ 12:15; 18-20' @ 12:30

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-E6

Weston & Sampson	PROJECT: Medfield State Hospital	REPORT OF BORING No. SB-F6D; SHEET 1 OF 1; Project No. 2190387; CHKD BY DGK

BORING Co.	TDS	BORING LOCATION	See attached site plan		
FOREMAN	Ari	GROUND SURFACE ELEV.	N/A	DATUM	N/A
WSE REP	Taylor Smith	DATE START	3/13/20	DATE END	3/13/20

SAMPLER: 24" Split Spoon

CASING: Telescoping - to 20'

CASING SIZE: 8" Method Hollow Stem Auger

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			14/24	0-2	5-12-10-7	13	Fine to coarse brown SAND with some gravel		
			12/24	2-4	9-5-9-8	15	Fine to medium brown SAND with trace gravel		
5									FILL
			18/24	5-7	10-16-35-18	33	Fine to medium SAND with trace gravel and silt		
			22/24	7-9	15-20-13-10	7			
10									
			13/24	10-12	14-19-23-30	4,217			
			10/24	12-14	25-14-15-20	710			
15			11/24	14-15.5	21-14-12-28	30	Fine to coarse light brown SAND with trace silt		
							Refusals at 15.5,16, and 19.5		
			14/18	18-19.5	26-31-40--	10			
20									
			7/7	21-21.5	21-60----	112	Brown medium SAND with pockets of weathered bedrock		NATIVE
25							Refusal at 25.5		
			3/3	25-25.2	60------	21			
30									
					-------		Refusal at 30		
35					-------		Refusal at 35; end of boring.		

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
Well set at 35', with screen from 30'-35'.
Sampled 25'-26'.
Sampled groundwater (collected low and high sample from top and bottom of screened interval).
Gathered composite sample for chemical analysis.

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-F6D

Weston & Sampson	PROJECT Medfield State Hospital	REPORT OF BORING No. SB-H6 SHEET 1 OF 1 Project No. 2190387 CHKD BY DGK

BORING Co.	TDS	BORING LOCATION	See attached site plan		
FOREMAN	Ari	GROUND SURFACE ELEV.	N/A	DATUM	N/A
WSE REP	Taylor Smith	DATE START	3/9/20	DATE END	3/9/20

SAMPLER: 24" Split Spoon

CASING:

CASING SIZE: Method Hollow Stem Auger

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			12/24	0-2	10-12-15-19	0	1" asphalt, 3" medium brown SAND, 8" fine light brown SAND with some gravel		FILL
			10/12	2-3	17-19----	0	7" brown fine SAND, 3" light brown fine SAND, refusal at 3'		
5			16/24	5-7	7-4-7-11	0			
			18/24	7-9	12-13-15-19	0	Light brown fine to medium SAND with trace gravel		
10			16/24	10-12	11-19-22-24	0	Dense brown fine to coarse sand with trace gravel		
			13/24	12-14	21-29-24-32	0			NATIVE
15			14/24	14-16	20-15-17-15	0	Very coarse (till) wet, some gravel, pockets of fine sand		
			22/24	16-18	13-31-38-50	0			
			5/24	18-18.5	70------	0			
20			6/24	20-20.5	18------	0			
							Very dense fine to coarse brown SAND		
25			5/24	25-25.5	60------	0			
							END OF BORING @ 25.5'		
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Well set at 25' with screen interval of 10'-25' bgs.
Groundwater screened with PID: 4 ppbv
Groundwater sampled at 1000 on 3/10/20

Soil sampled from 14'-16' bgs at 1045.
Soil sampled from 16'-18' bgs at 1100.

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-H6

Weston & Sampson

PROJECT	REPORT OF BORING No.	SB-E6D
Medfield State Hospital	SHEET 1 OF 1	
	Project No.	2190387
	CHKD BY	DGK

BORING Co.	TDS	BORING LOCATION	See attached site plan
FOREMAN	Ari	GROUND SURFACE ELEV.	N/A DATUM N/A
WSE REP	Taylor Smith	DATE START	3/11/20 DATE END 3/12/20

SAMPLER: 24" Split Spoon

CASING: Telescoping, driven to 20'

CASING SIZE: 8" Method Hollow Stem Auger

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			12/24	0-2	9-15-16-11	0			
			9/18	2-3.5	8-9-35--	0			
5							Fine to coarse brown SAND with some gravel and trace brick		FILL
			14/24	5-7	11-13-13-10	0	Refusal at 3.5' bgs.		
			15/24	7-9	11-11-17-21	0			
10			18/24	9-11	17-19-21-14	111			
			7/24	11-13	16-17-14-?	409			
							Fine to medium brown SAND with some gravel and trace silt		
15			14/24	14-16	10-18-19-31	2,314			
			5/24	16-18	25-19----	232			
20									
			12/12	20-21	34-58----	242			NATIVE
							Dense grey fine to coarse SAND Refusal at 21' bgs.		
25			10/12	24-25	25-31-120---	251			
							Dense tan fine to coarse SAND Refusal at 25' bgs.		
30			2/2	29-29.2	-------	1	Tan fine to coarse SAND (dense till)		
35							Refusal on bedrock at 35' bgs. END OF BORING @ 35'.		

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:

Depth to groundwater: 11.48' bgs
Well set to 35' bgs with screen interval form 30'-35' bgs.
Sand 29'-35', bentonite 27'-29', bentonite grout 1'-27'.
Groundwater sampled on 3/16/20.
Composite sample collected from 14'-18' bgs.
Sampled 24-25' bgs.
Sampled 29-30' bgs.

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-E6D

Weston & Sampson	PROJECT: Medfield State Hospital	REPORT OF BORING No. SB-H7A
		SHEET 1 OF 1
		Project No. 2190387
		CHKD BY DGK

BORING Co.	TDS	BORING LOCATION	See attached site plan		
FOREMAN	Ari	GROUND SURFACE ELEV.	N/A	DATUM	N/A
WSE REP	Taylor Smith	DATE START	3/10/20	DATE END	3/11/20

SAMPLER: 24" Split Spoon

CASING:

CASING SIZE: Method Hollow Stem Auger

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE REC/PEN (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
15							Augered to 15' bgs.		
			15/24	15-16	26-55----	0	Fine to coarse brown SAND with some gravel (till). Refusal at 16'		
20							END OF BORING @ 17' (REFUSAL)		

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
Well set at 17' bgs with screen from 7' to 17'.
Depth to groundwater of 14' bgs.
Purged dry and sampled at 1330.

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-H7A

Weston & Sampson

PROJECT	REPORT OF BORING No.	SB-H7
Medfield State Hospital	SHEET 1 OF 1	
	Project No.	2190387
	CHKD BY	DGK

BORING Co.	TDS	BORING LOCATION	See attached site plan
FOREMAN	Ari	GROUND SURFACE ELEV.	N/A DATUM N/A
WSE REP	Taylor Smith	DATE START 3/10/20	DATE END 3/10/20

SAMPLER: 24" Split Spoon

CASING:

CASING SIZE: Method Hollow Stem Auger

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			16/24	0-2	5-3-34--	0	3" asphalt, 4" brown fine to coarse SAND, 9" brown fine SAND		
			15/24	2-4	8-5-12-50	21	Light brown fine to medium SAND with some gravel		
5			18/24	5-7	9-20-21-29	0			
			22/24	7-9	14-18-39-41	0	Light brown fine to medium SAND with some dense gravel		
10			22/24	10-12	16-18-15-18	0	Light brown fine to medium SAND with some gravel		
			19/24	12-14	14-14-21-27	0	Light brown fine to coarse SAND with some gravel		
15			6/6	15-15.5	120------	0	Light brown fine to coarse SAND with some gravel		
							END OF BORING @ 16' (REFUSAL)		
20									
25									
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
Depth to groundwater: 15'
Sampled 15-15.5' at 1315.

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-H7

Weston & Sampson

PROJECT: Medfield State Hospital

REPORT OF BORING No. SB-GH-56

SHEET 1 OF 1

Project No. 2190387

CHKD BY DGK

BORING Co. TDS

FOREMAN Ari

WSE REP Taylor Smith

BORING LOCATION See attached site plan

GROUND SURFACE ELEV. N/A DATUM N/A

DATE START 3/9/20 DATE END 3/10/20

SAMPLER: 24" Split Spoon

CASING:

CASING SIZE: Method Hollow Stem Auger

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppb)	SAMPLE DESCRIPTION Burmister Classification	NOTES	STRATUM DESCRIPTION
			3/24	0-2	9-18-13-7	121	1" asphalt, 2" brown fine to coarse SAND with some gravel		FILL
			3/24	2-4	7-14-12-12	32	Brown fine to medium SAND with trace gravel		
5			17/24	4-6	5-6-7-12	16	Brown fine to medium SAND with trace gravel		NATIVE
			16/24	6-8	8-17-23-18	0	Light brown fine SAND with trace gravel		
10			21/24	8-10	4-13-22-28	0			
			12/24	10-12	23-120----	0	Brown fine to medium SAND with trace gravel		
			-/24	12-12.5	-------		Refusal at 12.5'		
15			17/24	15-17	3-12-9-8	0	Brown fine to medium SAND with trace gravel		
			22/24	17-19	12-16-23-60	0	Brown fine to medium SAND with some gravel		
20			11/18	19-20.5	17-50-50--	0	Weathered rock (possibly sandstone)		
			7/7	23-23.5	70------	0	Refusal at 23.5'.		
25							END OF BORING @ 25'		
30									
35									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS: Surface asphalt potential source of PID readings at surface.
Well set to 25' bgs with screen from 10'-25' bgs.
Depth to groundwater: 11.18' bgs.
Sampled groundwater on 3/11/20 at 0930.

Collected sample from 15-17' bgs at 0815
Collected sample from 17-19' bgs at 0830

NOTES:
1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. SB-GH-56

APPENDIX C

Bench-scale Study Reports

January 20, 2020 *Via E-Mail* (KurkjianD@wseinc.com)

Mr. Daron Kurkjian, P.E.
Project Manager
Weston & Sampson, Inc.
85 Devonshire Street, 3rd Floor
Boston, MA 02109

RE: Bench Scale Testing Results
Former Medfield State Hospital Site, Medfield, MA
XDD Project No. 19039

Dear Mr. Kurkjian,

XDD ENVIRONMENTAL, LLC (XDD) is pleased to submit this report to Weston & Sampson, Inc. (W&S) summarizing the results of the bench scale testing in support of the proposed remediation activities at the Former Medfield State Hospital Site, located in Medfield, Massachusetts (Site). The bench scale testing was performed in accordance with the scope of work described in XDD's *"Proposed Scope of Work for Bench Scale Testing Services" (Proposal)* dated September 4, 2019. XDD's Proposal included the testing of Zero Valent Iron (ZVI) technology using Ferox Flow ZVI powder, and the optional testing of Ferox PRB Granular ZVI (which was not conducted) for a potential permeable reactive barrier (PRB) installation.

1.0 INTRODUCTION AND BACKGROUND

Delineation efforts conducted by W&S have identified a proposed remediation target area at the Site. The target area covers approximately 11,000 square feet and is between approximately 8 and 20 feet below surface grade (ft bgs). Soils are reportedly glacial till comprised primarily of sand and gravel. The contaminants of concern (COCs) are chlorinated volatile organic compounds (CVOCs), primarily tetrachloroethene (PCE) which is present in this area at up to 5.1 milligrams per kilogram (mg/kg) at soil boring SB-G6-10-15', and up to 2,500 micrograms per Liter (µg/L) in groundwater at soil boring SB-F6.

Excavation of the upper 8 to 10 feet of soils followed by soil blending and addition of chemical oxidants (sodium persulfate or potassium permanganate are being considered) is currently being proposed as the remediation technique. Activated carbon (Plumestop® by Regenesis, Inc.) was also being proposed to be added to the downgradient portion of the target area to form a barrier against migration of any remaining low-level impacts following treatment.

Note that soil blending has not begun and is planned for later in 2020. Based on the improved contact possible through soil blending, XDD recommended that ZVI technology be considered as an alternative to In Situ Chemical Oxidation (ISCO[1]). ZVI has the potential to directly treat the source area impacts while also providing a long-term barrier against migration. ZVI is a proven technology that is very effective for the target COCs and can remain active for years to decades.

1.1 ZERO VALENT IRON TECHNOLOGY REVIEW

ZVI (Fe^0) is considered a chemical reducing agent which can initiate an abiotic oxidation-reduction reaction (or an electron transfer). When PCE, or other ions/molecules like oxygen (i.e., the "oxidizing agent"), comes into contact with ZVI, the ZVI loses electrons and PCE gains electrons. This electron transfer causes the breakdown of PCE[2]. As the ZVI is exposed to target contaminants, as well as other non-target constituents in the groundwater, the ZVI surface will eventually become oxidized (typically forming surficial ferric oxide or ferric oxyhydroxide). This can be seen visually as corrosion or rust formation on the surface of the ZVI. As the iron oxide film forms on the surface of the ZVI particle, it will start to impact the performance of the ZVI. This oxidation-reduction process will lead to the eventual passivation of the ZVI surface, at which point the capacity of the ZVI will be exhausted.

Many other compounds exist within an aquifer besides oxygen and the target contaminant (PCE) which can form precipitates or coatings on the surface of the ZVI. Under certain geochemical conditions within an aquifer, high levels of sulfates, nitrates, carbonates/hardness, organic

1 XDD conducted bench testing (2013) to evaluate sodium persulfate ISCO technologies for application at this Site. Soil oxidant demand and total oxidant demand ranged from 0.3 grams per kilogram (g/Kg) to 8.8 g/Kg depending on the activation methods employed. Carus Corporation (Carus) conducted additional bench testing of permanganate and persulfate technology (2015). Carus determined a similar range of oxidant demands between 1.02 g/Kg and 9.98 g/Kg depending on the technology.

2 PCE is hypothesized to breakdown primarily through a number of intermediate acetylene compounds via the β-elimination pathway, although other reactions may occur (hydrogenolysis and hydrolysis reactions). Hydrogen (H^+) is also released during this reaction which can aid biological activity.

material (such as total organic carbon [TOC] or humic acids), etc. can all exert a demand on the ZVI or coat the surface, resulting in premature passivation or fouling.

The key to successful remediation using ZVI is to ensure that non-target constituents do not prematurely passivate the ZVI, or to provide enough ZVI so that it can satisfy the long-term demand and remain active for many years.

1.2 PRIOR ISCO TREATMENTS AND POTENTIAL EFFECTS ON ZVI PERFORMANCE

According to information provided to XDD, three full-scale ISCO injection events were conducted at the Site (February 2014, May 2014, and November 2014/January 2015). These oxidant treatments were conducted using sodium persulfate ($Na_2S_2O_8$) and sodium hydroxide (NaOH) which is also known as Alkaline Activated Persulfate (AAP) technology. A limited amount of potassium permanganate ($KMnO_4$) was also applied.

These prior full-scale ISCO treatments are noted because it is possible that the residual impacts of these treatments (and/or other naturally occurring geochemical constituents) could have affected the performance of the ZVI in this bench study (discussed later in this report). ISCO treatment will create oxidized constituents within soil and will also release dissolved constituents (such as sulfate) which can interfere with the performance of the ZVI (e.g., promoting premature ZVI passivation, etc.).

This initial bench-scale study did not include a screening review for excessive levels of geochemical constituents that could have interfered with the process; the degree of non-target demands/interferences are typically evaluated empirically as part of the standard testing protocols by testing several dosing levels. A higher than anticipated interference was identified during this study based on incomplete PCE treatment even when using a conservatively high ZVI dosing level (i.e., up to 3% ZVI by weight, which is typically more than adequate to account for normal interferences). Had PCE been fully destroyed in this initial bench-scale study, further non-target constituent evaluation/identification would not be needed or recommended. Therefore, based on the results of this bench testing, Weston & Sampson has recommended that additional soil and groundwater data be collected and reviewed to identify if excessive levels of common constituents that are known to impart non-target demands on ZVI are present. Additional ZVI bench-testing was also recommended to verify that a higher dosing level of ZVI (i.e., greater than 3% ZVI by weight) can overcome these interferences and achieve complete destruction of PCE within a reasonable residence time.

2.0 APPROACH

XDD evaluated the bench scale treatment of PCE using ZVI technology. Specifically, the objective was to determine the required ZVI material loading rate for direct source treatment via soil mixing (and to account for contaminant mass as well as non-target constituents which could passivate the ZVI and reduce long-term efficacy). An optional evaluation of ZVI for installation of a potential Permeable Reactive Barrier (PRB) was also included.

The scope of work (SOW) was as follows:

1. Groundwater and soil samples (collected by others) were received at XDD's in-house laboratory. Soil samples were homogenized prior to testing.
2. The baseline soil and groundwater concentrations were evaluated to determine if PCE levels were representative of Site concentrations, and if too low for testing, spike the soil samples with PCE to create a representative soil sample for testing.
3. Phase 1 testing was conducted to determine the range of ZVI dosing for Phase 2. This was conducted by evaluating the pH and Oxidation Reduction Potential (ORP) within the bench reactors at each ZVI loading level.
4. Phase 2 testing was conducted at the ZVI loading range established during Phase 1 testing. The objective of Phase 2 was to confirm PCE destruction at each ZVI loading range.

A ZVI powder product which is suitable for direct mixing within the source area was evaluated in the Phase 1 and 2 bench testing. A granular ZVI appropriate for a PRB installation, in which the ZVI would be mixed with an engineered backfill and then mixed with impacted groundwater to confirm complete destruction, was evaluated in the Phase 1 testing only after consultation with W&S. Hepure Remediation Products (www.Hepure.com) is a supplier of remediation grade ZVI products that are high quality and purity (95% pure ZVI, free of residual oils, consistent particle size ranges, etc.). The following Hepure ZVI products were used in the bench testing:

1. Ferox Flow ZVI Powder (Ferox Flow):
    a. -100/+325 Mesh ZVI (~125-micron average particle size)
    b. Typically used in treatment of source area soils due to high surface area/activity.
2. Ferox PRB Granular ZVI (Ferox PRB):
    a. -8/+50 Mesh ZVI (~325-micron average particle size)
    b. Typically used in PRB applications.

3.0 BENCH SCALE TESTING

Upon receipt of soil and groundwater samples at XDD's laboratory, the soil was homogenized, and small rocks were removed. This was conducted as efficiently as possible to minimize volatilization of contaminants.

Baseline soil and groundwater samples were submitted to Absolute Resource Associates (ARA) located in Portsmouth, NH for volatile organic compounds (VOCs) analyses using EPA 8260. The baseline data from the soil indicated non-detect levels of PCE compared to historical data (up to 5.1 mg/kg at SB-G6-10-15'), suggesting that the samples were not representative of the COC impacts to be treated. Therefore, after consultation with W&S, it was agreed that XDD would spike the soil that would be used in the Phase 2 tests to achieve similar concentrations of PCE typically detected at the Site. The soil was spiked with PCE using a vapor deposition procedure to target a final soil concentration of approximately 5 mg/kg PCE (after any expected partitioning into groundwater), which is the maximum soil concentration that has been detected within the identified source area of the Site. Soil used in the Phase 1 tests was not spiked since the Phase 1 tests focused on the geochemical interaction of ZVI with the soils, not the contaminant.

The tests were conducted in duplicate in a series of batch reactors (40-milliliter [mL] borosilicate-glass unless otherwise specified) at 70 degrees Fahrenheit (°F). Approximately two pore volumes of groundwater were applied to the soil unless otherwise noted. Identical control reactors were set up in each phase and carried through the same procedures as the test reactors.

- **Phase 1 – Geochemical Testing**: Phase 1 was conducted using three loading ranges of Ferox Flow (0.4%, 1.5%, and 3.0%) and three loadings of Ferox PRB (10%, 15%, and 20%). The pH and ORP of the groundwater/soil reactors were monitored to determine the effect of the ZVI addition. The ZVI loading should be adequate to result in a significant reduction in ORP. Changes in ORP/pH were monitored for 6 days to evaluate aging of the ZVI over time. ORP/pH readings were measured in XDD's laboratory.

- **Phase 2 – Contaminant Destruction Testing**: Following discussions with W&S, it was decided to focus the Phase 2 bench scale testing on Ferox Flow only. Based on the results of the Phase 1 testing and after consultation with W&S, the ZVI dosing in Phase 2 was conducted at 0.4%, 1.5%, and 3.0% of Ferox Flow. After a 3-week reaction time, the reactors were submitted to ARA for the analysis of VOCs in soil and groundwater.

4.0 RESULTS

4.1 PHASE 1 – GEOCHEMICAL TESTING

Phase 1 was conducted at three loadings of Ferox Flow (0.4%, 1.5%, and 3.0%) and three loadings of Ferox PRB (10%, 15%, and 20%). The pH and ORP of the groundwater/soil reactor was monitored to determine the effect of the ZVI addition; results are presented on **Figures 1 and 2**, respectively.

The pH results in **Figure 1** show that for all test conditions, pH gradually increased with time. This was expected, as it is typical for the pH to be alkaline in a ZVI application.

The ORP results in **Figure 2** show that all doses of the Ferox Flow and Ferox PRB achieved significantly reducing conditions. In general, as the dosage rate (% weight) increased, the reduction potential increased (more negative ORP). The results for the Ferox Flow 3% dose were slightly inconsistent in that the ORP was initially less negative as compared to the lower doses of Ferox Flow. However, the ORP eventually achieved the target levels by the end of the 6-day test period. The variability could be due to soil heterogeneity which impacted the kinetics of the reactions.

4.2 PHASE 2 – CONTAMINANT DESTRUCTION TESTING

The Phase 2 contaminant destruction testing was conducted at 0.4%, 1.5%, and 3.0% loadings of Ferox Flow. The analytical results for the soil and groundwater are presented on **Tables 1 through 3**. Laboratory analytical reports are included in **Attachment A**.

- **Controls:** Control reactor vials were monitored to assess potential losses of target VOCs and were compared directly to the treated reactors to evaluate contaminant destruction. The data show higher concentrations of PCE in the spiked control reactors than targeted for soil (7.7 mg/kg [**Table 1**] versus 5 mg/kg). This is attributed to XDD's spiking procedure, in which 1.5 to 2 times the targeted spike concentration is applied to overcome any volatile losses during the spiking procedure and transfer to individual batch reactors. In this case, there were minimal losses and so the actual concentrations were higher than 5 mg/kg. There was also some partitioning from the soil into the aqueous phase, which resulted in 59,000 μg/L of PCE (**Table 2**). This dissolved phase concentration is significantly higher than maximum groundwater concentrations observed at the Site to date.

- **ZVI test conditions:**
  - 0.4% ZVI: Compared to the controls, total VOCs concentrations were reduced by 29% in soil (**Table 1**) and 64% in groundwater (**Table 2**). The total mass of VOCs reduced in soil and groundwater compared to the controls was 52% (**Table 3**). The primary VOC detected in soil and groundwater was PCE. Relatively low levels of trichloroethene (TCE) were detected in soil and groundwater at higher concentrations than the control due to the degradation of PCE to TCE.
  - 1.5% ZVI: Compared to the controls, total VOCs concentrations were reduced by 54% in soil (**Table 1**) and 84% in groundwater (**Table 2**). The total mass of VOCs reduced in soil and groundwater compared to the controls was 74% (**Table 3**). The primary VOC detected in soil and groundwater was PCE. Relatively low levels of TCE were detected in soil and groundwater at higher concentrations than the controls due to the degradation of PCE to TCE.
  - 3% ZVI: Compared to the controls, total VOCs concentrations were reduced by 63% in soil (**Table 1**) and 93% in groundwater (**Table 2**). The total mass of VOCs reduced in soil and groundwater compared to the control was 83% (**Table 3**). The primary VOC detected in soil and groundwater was PCE. TCE was detected in groundwater, but at a concentration lower than the control reactor.

4.3 RESULTS SUMMARY

The ZVI treatment resulted in between 52% and 83% reduction in total VOCs mass (total of dissolved mass within the groundwater and adsorbed mass on the soil) within the batch reactors. The level of total VOCs reduction in each reactor was consistent with the increased dosing levels.

Results Summary: Reduction in Total VOCs vs. ZVI Loading

ZVI Loading	Concentration Reduction in Soil	Concentration Reduction in Groundwater	Total Mass Reduction
(wt. ZVI/wt. Soil)	(%)	(%)	(%)
0.4%	29%	52%	52%
1.5%	54%	84%	74%
3.0%	63%	93%	83%

Overall the ZVI performed well considering that the PCE mass within the batch reactors was higher than the actual PCE levels anywhere at the Site[3].

However, the reductions are generally lower than expected which appears to indicate that the ZVI capacity was nearing exhaustion. There may have been additional interferences with the process which prevented a higher mass reduction result (as discussed in the following section).

5.0 DISCUSSION OF RESULTS

Based on prior experience with ZVI, XDD was anticipating near complete, if not complete, destruction of the target VOCs (PCE) during this testing. The low ZVI dosing of 0.4% is typically adequate assuming that soil mixing/contact is uniform, and adequate residence time is allowed. XDD had recommended the higher dosing levels (1.5% and 3.0%) be evaluated for practical reasons, such as ensuring that the ZVI could destroy the contaminant mass but also provide long-term capacity as a ZVI barrier.

One concern is that the ZVI appears to have become partially exhausted relatively quickly after application, possibly due to non-target constituents within the soil/groundwater samples tested. This is a concern because it may reduce the effectiveness of the ZVI as a long-term barrier. This can possibly be overcome with higher dosing of ZVI or by modified ZVI formulations.

XDD reviewed some of the factors that could have impacted the ZVI performance, as discussed below:

5.1 POTENTIAL FACTORS AFFECTING ZVI PERFORMANCE/LONGEVITY

- **ZVI Loading/Stoichiometric Degradation Ratios**:
  The ZVI dosages applied in the bench scale test were estimated to be on the order of 4 to 20 times greater than the minimum dosing requirement (based on typical stoichiometric degradation ratios for PCE mass to ZVI mass). Additionally, the ZVI to soil ratios used in the study were within the range, or slightly higher than, bench scale and field studies found in the literature. Although the PCE mass within the batch reactors was substantially

3 Baseline PCE concentrations within the batch reactor after spiking were approximately 7.7 mg/Kg on soil and 59,000 μg/L in groundwater. In comparison, the maximum PCE concentrations detected at the Site are in the range of 5.1 mg/Kg on soil and 2,500 μg/L in groundwater based on available data.

higher than the actual field conditions, it is not believed that the PCE mass alone consumed the full capacity of the ZVI based on this analysis.

- **Reaction Kinetics vs. Overall Contact Time:**
  For this bench scale test, the ZVI was allowed to contact the soil and groundwater for three weeks. This was considered a sufficient reaction period based on other studies conducted by XDD and based on the known reaction kinetics.

  Literature values were reviewed and also confirmed degradation half-lives are typically on the order of several hours to a few days for PCE degradation associated with an application of micro-scale ZVI. In addition, higher doses of ZVI are often associated with faster reaction kinetics. Other factors, such as soil desorption rates can impact the overall kinetics. Most importantly, it is well documented that the onset of surface passivation can slow the reaction kinetics (i.e., as the surface of the ZVI gets coated with corrosion by-products, etc.).

  Therefore, XDD believes that additional contact time in the reactors would not likely have increased the overall mass reduction significantly. This suggests that the ZVI capacity was partially exhausted, or the surface had been sufficiently passivated so that the reaction kinetics slowed substantially.

- **Non-Target Constituents/Surface Passivation**: Common, naturally occurring non-target constituents that may be present in soil/groundwater that can react with the ZVI and passivate the surface include oxygen[4], sulfate, nitrate, dissolved solids (carbonates and hardness), and high organic content, etc. For this reason, a safety factor is often incorporated in the ZVI loading. If one or more of these non-target inhibitors is present in unusually high amounts, it could result in premature passivation of the ZVI. The presence of these naturally occurring potential inhibitors was not evaluated during this bench test.

  As noted previously, a **number of full-scale ISCO injections** were also conducted at the site using persulfate and permanganate oxidants. The residual impact of these ISCO processes could also have had an impact on the ZVI performance as follows:

4 Note that XDD minimized any oxygen introduction to the samples during the assembly of the reactors and then the reactors were completely sealed during the entire duration of the testing, so ambient oxygen passivation was not a contributor to the observations.

- Oxidants would oxidize naturally occurring minerals/metals, etc. which could then persist in the soil and potentially react with the ZVI during mixing.
- Permanganate contains manganese and a byproduct of the reaction is the formation of manganese oxides which precipitate in the aquifer and could react with the ZVI during mixing.
- Persulfate releases sulfate which if still present at high levels in the groundwater could react with the ZVI.
- Carus noted a small amount of residual permanganate (4.4 mg/L) detected in the groundwater that they used during their 2015 bench study. It is unlikely that any residual oxidant was present in the water tested by XDD, but this was noted.

Therefore, based on the results, it appears that the performance of the ZVI was impacted by non-target constituents. This could be due to a naturally occurring non-target inhibitor or potentially related to the prior ISCO treatment (to be further evaluated).

6.0 CONCLUSIONS AND RECOMMENDATIONS

The bench scale data support the following conclusions and recommendations:

- The Phase 1 results indicate that Ferox Flow ZVI loadings of 0.4%, 1.5%, and 3% achieved adequate reductions in ORP.
- The Phase 2 results suggest Ferox Flow ZVI powder is a potentially viable technology for direct source treatment of PCE via soil mixing. Up to 83% PCE mass reduction was achieved using the highest dosage of ZVI.
- Another option would be to further increase the full-scale ZVI dosing to ensure higher reductions of PCE and to overcome potential inhibitors. However, there is some risk associated with this option with the unknown source/magnitude of the non-target demands on the ZVI. Further evaluation might be needed to increase certainty of the process, and more importantly, to ensure that the ZVI remains viable for an extended period after installation (i.e., years).

- <u>Recommended next steps</u>:
  - XDD recommends correlating the locations where the ZVI bench study samples were collected with the prior ISCO events to determine if there was direct correlation. Even if this turns out not to be a factor for these specific bench study

samples, this is recommended to be reviewed within the target area of soil mixing since this could very well impact the performance during full-scale.

- If the ZVI study samples can be confirmed to be non-impacted by the ISCO processes, other traditional soil/water analysis data can be reviewed (or collected) to determine the presence of non-target constituents that might be potential passivation mechanisms, such as:
  - Organic carbon, dissolved solids
  - Sulfate, nitrate, etc.
  - Carbonates, hardness, alkalinity
  - Other parameters may be applicable and can be discussed.
- XDD can potentially analyze the residual soils retained from the study for the presence of some of the most likely naturally occurring inhibitors, but we will need to evaluate how much material is available and if the results can be considered representative since the soil/water was collected some time ago.
- Depending on the results from the above data evaluation and non-target demand analyses, the bench test could be repeated at a higher loading and slightly longer reaction periods.

XDD can provide additional assistance on this evaluation if W&S wishes to gain additional certainty in the ZVI design loading before making a final go/no-go decision on ZVI technology.

XDD appreciates the opportunity to be of assistance to W&S on this important project. Please do not hesitate to call me at 603-778-1100 should you have any questions on the contents of this report.

Sincerely,

XDD ENVIRONMENTAL, LLC

Scott C. Crawford, P.E. (Licensed in NH, WV, and NJ)
Sr. Project Manager

Cc: Laurel Crawford, XDD
Mike Marley, XDD
File

FIGURES

Figure 1
Phase 1 pH Results
Former Medfield State Hospital Site
Medfield, Massachusetts

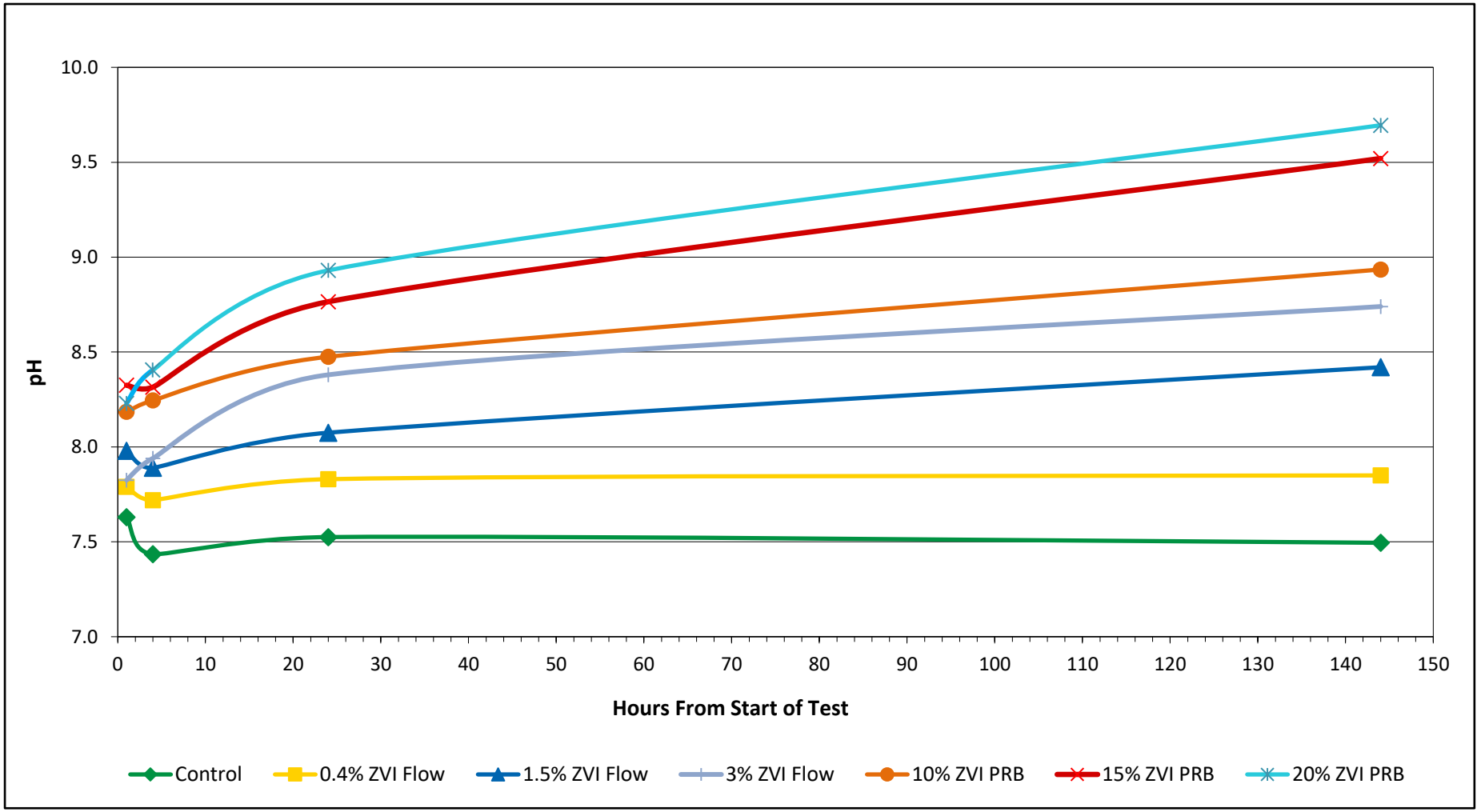
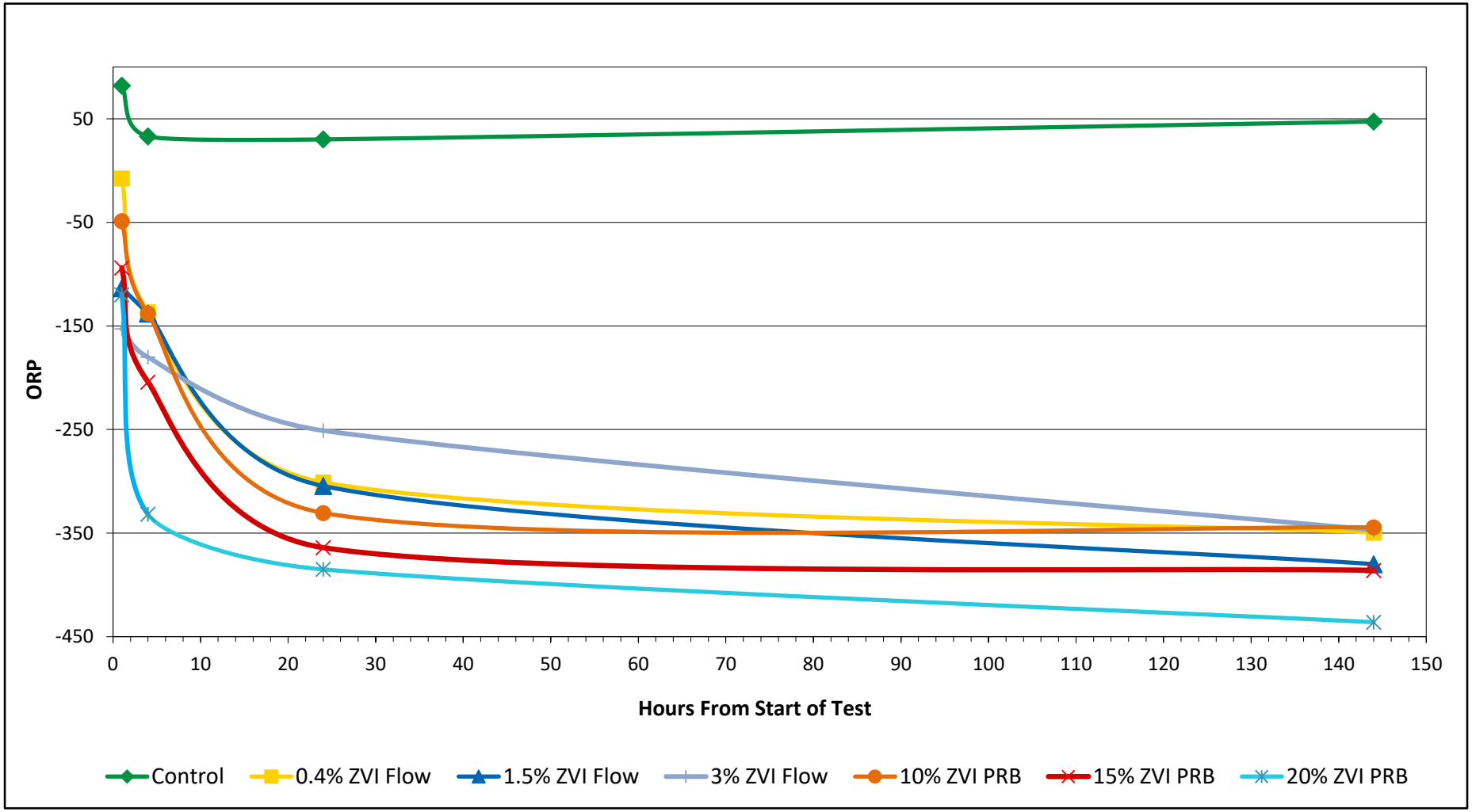


Figure 2
Phase 1 ORP Results
Former Medfield State Hospital Site
Medfield, Massachusetts



TABLES

Table 1
Phase 2 Analytical Results: Soil
Former Medfield State Hospital Site
Medfield, Massachusetts

Analyte	Control	Control Dup	Average	0.4% ZVI	0.4% ZVI Dupe	Average	Percent Reduction[1,2]	1.5% ZVI	1.5% ZVI Dupe	Average	Percent Reduction[1,2]	3% ZVI	3% ZVI Dupe	Average	Percent Reduction[1,2]
VOCs	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(%)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(%)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(%)
cis-1,2-DCE	0.06 U	0.06 U	0.06 U	0.067 U	0.073 U	0.070 U	N/A	0.076 U	0.072 U	0.074 U	N/A	0.081 U	0.077 U	0.079 U	N/A
TCE	0.06 U	0.10	0.08	0.068	0.099	0.084	-4	0.076 U	0.17	0.123	-54	0.081 U	0.077 U	0.079 U	1
PCE	8.0	7.3	7.7	5.6	5.2	5.4	29	2.9	4.0	3.5	55	2.5	3.2	2.9	63
Total Detected VOCs	**8.0**	**7.4**	**7.7**	**5.7**	**5.3**	**5.5**	29	**2.9**	**4.2**	**3.5**	54	**2.5**	**3.2**	**2.9**	63

Notes:
ZVI = Zero Valent Iron (Ferox Flow, Hepure Remdiation Products)
VOCs = volatile organic compounds
mg/kg = milligrams per kilogram
U = not detected at the indicated concentration
cis-1,2-DCE = cis-1,2-dichloroethene
TCE = trichloroethene
PCE = tetrachloroethene
N/A = not applicable; control not detected and treated test reactor either not detected or detected at a concentration below the control reporting limit.
NR = no reduction; indicates an increase in concentration compared to the control, but the sample was not detected at the indicated concentration.
Negative percent reductions indicate an increase in concentration compared to the control.

1. Percent reductions calculated by comparison with the control.
2. For the purposes of this evaluation, the sample reporting limit was used to calculate percent reduction for values that were not detected above the sample reporting limit.
3. Control reactors did not contain the oxidant.
4. Only detected compounds are shown.

Table 2
Phase 2 Analytical Results: Groundwater
Former Medfield State Hospital Site
Medfield, Massachusetts

Analyte	Control	0.4% ZVI	Percent Reduction[1,2]	1.5% ZVI	Percent Reduction[1,2]	3% ZVI	Percent Reduction[1,2]
VOCs	(µg/L)	(µg/L)	(%)	(µg/L)	(%)	(µg/L)	(%)
cis-1,2-DCE	780	200 U	74	100 U	87	20 U	97
TCE	400 U	550	-38	770	-93	230	N/A
PCE	59,000	21,000	64	8,800	85	4,200	93
Total Detected VOCs	**59,780**	**21,550**	64	**9,570**	84	**4,430**	93

Notes:
ZVI = Zero Valent Iron (Ferox Flow, Hepure Remdiation Products)
VOCs = volatile organic compounds
µg/L = micrograms per liter
U = not detected at the indicated concentration
cis-1,2-DCE = cis-1,2-dichloroethene
TCE = trichloroethene
PCE = tetrachloroethene
N/A = not applicable; control not detected and treated test reactor either not detected or detected at a concentration below the control reporting limit.
Negative percent reductions indicate an increase in concentration compared to the control.

1. Percent reductions calculated by comparison with the control.
2. For the purposes of this evaluation, the sample reporting limit was used to calculate percent reduction for values that were not detected above the sample reporting limit.
3. Control reactors did not contain the oxidant.
4. Only detected compounds are shown.
5. In addition to the compounds shown, chloromethane (47 µg/L) and chloroform (28 µg/L) were detected in the 3% ZVI sample. These compounds are common laboratory contaminants and/or by-products known to occur during ISCR processes.

Table 3

Phase 2 Analytical Results: Total Mass Degraded in Soil and Groundwater

Former Medfield State Hospital Site

Medfield, Massachusetts

Test Condition	Total VOCs		Total VOC Mass			Total VOC Mass Degraded			
	Water (µg/L)	Soil (mg/kg)	Water (µg)	Soil (µg)	Water + Soil (µg)	Water (µg)	Soil (µg)	Water + Soil (µg)	% Reduction
Control	59,780	7.7	3,504	1,771	5,275	--	--	--	--
0.4% ZVI	21,550	5.5	1,263	1,261	2,524	2,241	510	2,750	52%
1.5% ZVI	9,570	3.5	561	813	1,374	2,943	958	3,901	74%
3% ZVI	4,430	2.9	260	656	915	3,244	1,116	4,360	83%

Notes:

ZVI = Zero Valent Iron (Ferox Flow, Hepure Remdiation Products)

VOCs = volatile organic compounds

Non-detect compounds were not included in the totals.

Control reactors did not contain the oxidant.

VOCs = volatile organic compounds

mg/kg = milligrams per kilogram

µg/L = micrograms per liter

-- = not applicable

ATTACHMENT A
Laboratory Reports

Laboratory Report

Absolute Resource associates
124 Heritage Avenue Portsmouth NH 03801

Laurel Crawford
Xpert Design & Diagnostics, LLC
22 Marin Way
Unit 3
Stratham, NH 03885

PO Number: None
Job ID: 50551
Date Received: 10/1/19

Project: W&S Medfield 19039

Attached please find results for the analysis of the samples received on the date referenced above.

Unless otherwise noted in the attached report, the analyses performed met the requirements of Absolute Resource Associates' Quality Assurance Plan. The Standard Operating Procedures are based upon USEPA SW-846, USEPA Methods for Chemical Analysis of Water and Wastewater, Standard Methods for the Examination of Water and Wastewater and other recognized methodologies. The results contained in this report pertain only to the samples as indicated on the chain of custody.

Absolute Resource Associates maintains certification with the agencies listed below.

We appreciate the opportunity to provide laboratory services. If you have any questions regarding the enclosed report, please contact the laboratory and we will be glad to assist you.

Sincerely,
Absolute Resource Associates

Jennifer Lowe
Laboratory Manager

Date of Approval: 10/14/2019
Total number of pages: 8

Absolute Resource Associates Certifications

New Hampshire	1732	Massachusetts	M-NH902
Maine	NH903		

Project ID: W&S Medfield 19039
Job ID: 50551
Sample#: 50551-001
Sample ID: Baseline-W
Matrix: Water
Sampled: 9/30/19 13:50

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Analysis Batch	Analysis Date	Analysis Time	Reference
dichlorodifluoromethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
chloromethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
vinyl chloride	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
bromomethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
chloroethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
trichlorofluoromethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
diethyl ether	< 5	5	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
acetone	< 50	50	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,1-dichloroethene	< 1	1	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
methylene chloride	< 5	5	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
carbon disulfide	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
methyl t-butyl ether (MTBE)	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
trans-1,2-dichloroethene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,1-dichloroethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
2-butanone (MEK)	< 10	10	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
2,2-dichloropropane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
cis-1,2-dichloroethene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
chloroform	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
bromochloromethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
tetrahydrofuran (THF)	< 10	10	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,1,1-trichloroethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,1-dichloropropene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
carbon tetrachloride	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,2-dichloroethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
benzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
trichloroethene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,2-dichloropropane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
bromodichloromethane	< 1	1	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
dibromomethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
4-methyl-2-pentanone (MIBK)	< 10	10	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
cis-1,3-dichloropropene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
toluene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
trans-1,3-dichloropropene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
2-hexanone	< 10	10	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,1,2-trichloroethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,3-dichloropropane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
tetrachloroethene	**27**	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
dibromochloromethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,2-dibromoethane (EDB)	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
chlorobenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,1,1,2-tetrachloroethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
ethylbenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
m&p-xylenes	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D

Absolute Resource associates

Project ID: W&S Medfield 19039
Job ID: 50551
Sample#: 50551-001
Sample ID: Baseline-W
Matrix: Water
Sampled: 9/30/19 13:50

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
styrene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
bromoform	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
isopropylbenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,1,2,2-tetrachloroethane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,2,3-trichloropropane	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
n-propylbenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
bromobenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,3,5-trimethylbenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
2-chlorotoluene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
4-chlorotoluene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
tert-butylbenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,2,4-trimethylbenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
sec-butylbenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,3-dichlorobenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
4-isopropyltoluene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,4-dichlorobenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,2-dichlorobenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
n-butylbenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,2-dibromo-3-chloropropane (DBCP)	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,2,4-trichlorobenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
hexachlorobutadiene	< 0.5	0.5	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
naphthalene	< 5	5	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
1,2,3-trichlorobenzene	< 2	2	ug/L	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**96**	78-114	%	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
toluene-D8 SUR	**97**	88-110	%	1	LMM		1902955	10/3/19	14:44	SW5030C8260D
4-bromofluorobenzene SUR	**90**	86-115	%	1	LMM		1902955	10/3/19	14:44	SW5030C8260D

Project ID: W&S Medfield 19039
Job ID: 50551
Sample#: 50551-002
Sample ID: Baseline-S
Matrix: Solid Percent Dry: 90.7% Results expressed on a dry weight basis.
Sampled: 9/30/19 13:55

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
chloromethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
vinyl chloride	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
bromomethane	< 0.30	0.30	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
chloroethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
trichlorofluoromethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
diethyl ether	< 0.59	0.59	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
acetone	< 3.0	3.0	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,1-dichloroethene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
methylene chloride	< 0.30	0.30	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
carbon disulfide	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
trans-1,2-dichloroethene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,1-dichloroethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
2-butanone (MEK)	< 0.36	0.36	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
2,2-dichloropropane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
cis-1,2-dichloroethene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
chloroform	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
bromochloromethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
tetrahydrofuran (THF)	< 0.59	0.59	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,1,1-trichloroethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,1-dichloropropene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
carbon tetrachloride	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,2-dichloroethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
benzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
trichloroethene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,2-dichloropropane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
bromodichloromethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
dibromomethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.54	0.54	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
cis-1,3-dichloropropene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
toluene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
trans-1,3-dichloropropene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
2-hexanone	< 0.59	0.59	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,1,2-trichloroethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,3-dichloropropane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
tetrachloroethene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
dibromochloromethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,2-dibromoethane (EDB)	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
chlorobenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
ethylbenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
m&p-xylenes	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D

Absolute Resource associates

Project ID: W&S Medfield 19039
Job ID: 50551
Sample#: 50551-002
Sample ID: Baseline-S
Matrix: Solid Percent Dry: 90.7% Results expressed on a dry weight basis.
Sampled: 9/30/19 13:55

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
styrene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
bromoform	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
isopropylbenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,2,3-trichloropropane	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
n-propylbenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
bromobenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,3,5-trimethylbenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
2-chlorotoluene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
4-chlorotoluene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
tert-butylbenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,2,4-trimethylbenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
sec-butylbenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,3-dichlorobenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
4-isopropyltoluene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,4-dichlorobenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,2-dichlorobenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
n-butylbenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,2,4-trichlorobenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
hexachlorobutadiene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
naphthalene	< 0.30	0.30	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
1,2,3-trichlorobenzene	< 0.12	0.12	ug/g	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**88**	78-114	%	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
toluene-D8 SUR	**98**	88-110	%	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
4-bromofluorobenzene SUR	**91**	86-115	%	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D
a,a,a-trifluorotoluene SUR	**97**	70-130	%	1	LMM	10/3/19	12072	10/3/19	21:23	SW5035A8260D

Note: This solid sample was preserved in methanol at the lab on 10/1/19.

Project ID: W&S Medfield 19039
Job ID: 50551
Sample#: 50551-003
Sample ID: Baseline Dup-S
Matrix: Solid Percent Dry: 92.3% Results expressed on a dry weight basis.
Sampled: 9/30/19 14:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
chloromethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
vinyl chloride	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
bromomethane	< 0.28	0.28	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
chloroethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
trichlorofluoromethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
diethyl ether	< 0.56	0.56	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
acetone	< 2.8	2.8	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,1-dichloroethene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
methylene chloride	< 0.28	0.28	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
carbon disulfide	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
trans-1,2-dichloroethene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,1-dichloroethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
2-butanone (MEK)	< 0.34	0.34	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
2,2-dichloropropane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
cis-1,2-dichloroethene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
chloroform	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
bromochloromethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
tetrahydrofuran (THF)	< 0.56	0.56	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,1,1-trichloroethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,1-dichloropropene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
carbon tetrachloride	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,2-dichloroethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
benzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
trichloroethene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,2-dichloropropane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
bromodichloromethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
dibromomethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.51	0.51	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
cis-1,3-dichloropropene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
toluene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
trans-1,3-dichloropropene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
2-hexanone	< 0.56	0.56	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,1,2-trichloroethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,3-dichloropropane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
tetrachloroethene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
dibromochloromethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,2-dibromoethane (EDB)	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
chlorobenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
ethylbenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
m&p-xylenes	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D

Absolute Resource associates

Project ID: W&S Medfield 19039
Job ID: 50551
Sample#: 50551-003
Sample ID: Baseline Dup-S
Matrix: Solid Percent Dry: 92.3% Results expressed on a dry weight basis.
Sampled: 9/30/19 14:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
styrene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
bromoform	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
isopropylbenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,2,3-trichloropropane	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
n-propylbenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
bromobenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,3,5-trimethylbenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
2-chlorotoluene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
4-chlorotoluene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
tert-butylbenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,2,4-trimethylbenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
sec-butylbenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,3-dichlorobenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
4-isopropyltoluene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,4-dichlorobenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,2-dichlorobenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
n-butylbenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,2,4-trichlorobenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
hexachlorobutadiene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
naphthalene	< 0.28	0.28	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
1,2,3-trichlorobenzene	< 0.11	0.11	ug/g	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**90**	78-114	%	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
toluene-D8 SUR	**100**	88-110	%	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
4-bromofluorobenzene SUR	**92**	86-115	%	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D
a,a,a-trifluorotoluene SUR	**97**	70-130	%	1	LMM	10/3/19	12072	10/7/19	21:37	SW5035A8260D

Note: This solid sample was preserved in methanol at the lab on 10/1/19.

Absolute Resource associates

Absolute Resource associates
124 Heritage Avenue #10
Portsmouth, NH 03801
603-436-2001
absoluteresourceassociates.com

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

50551

Company Name: XDD Environmental
Company Address: 22 Marin Way, Unit #3 Stratham. NH 03885
Report To: Laurel Crawford
Phone #: 603-778-1100
Invoice To: AP@xdd-llc.com

Project Name: W25 Medfield
Project #: 19039
Project Location: NH MA ME VT Other
Protocol: RCRA SDWA NPDES MCP NHDES OTHER
Reporting Limits: QAPP GW-1 S-1 EPA DW Other
Quote # NH GREE/ODD Fund Pricing
PO #

Lab Sample ID (Lab Use Only)	Field ID	# CONTAINERS	Matrix: WATER	Matrix: SOLID	Matrix: OTHER	Preservation Method: HCl	Preservation Method: HNO_3	Preservation Method: H_2SO_4	Preservation Method: NaOH	Preservation Method: MeOH	Preservation Method: OTHER (Specify)	Sampling: DATE	Sampling: TIME	Sampling: SAMPLER	VOC 8260
50551-01	Baseline-W	2	X			X						9/30/19	13:50	BC	X
-02	Baseline-S	1		X							X	9/30/19	13:55	BC	Y
-03	Baseline Dup-S	1		Y							X	9/30/19	14:00	BC	Y

ANALYSIS REQUEST

VOC 8260 ☐ VOC 8260 NHDES ☐ VOC 8260 MADEP ☐ VOC 624 ☐ VOC BTEX ☐ MBE, only ☐ VOC 8021VT ☐ VPH MADEP ☐ MEGRO ☐ GRO 8015 ☐ VOC 524.2 ☐ VOC 524.2 NH List ☐ Gases-List: ☐ TPH ☐ DRO 8015 ☐ MEDRO ☐ EPH MADEP ☐ TPH Fingerprint ☐ 8270PAH ☐ 8270ABN ☐ 625 ☐ EDB 504.1 ☐ 8082 PCB ☐ 8081 Pesticides ☐ 608 Pest/PCB ☐ O&G 1664 ☐ Mineral O&G SM5520F ☐ pH ☐ BOD ☐ Conductivity ☐ Turbidity ☐ TSS ☐ TDS ☐ TS ☐ TVS ☐ Alkalinity ☐ RCRA Metals ☐ Priority Pollutant Metals ☐ TAL Metals ☐ Total Metals-list: ☐ Dissolved Metals-list. ☐ Ammonia ☐ COD ☐ TKN ☐ TN ☐ TON ☐ T-Phosphorus ☐ Phenols ☐ Bacteria P/A ☐ Bacteria MPN ☐ Cyanide ☐ Sulfide ☐ Nitrate + Nitrite ☐ Ortho P ☐ Nitrate ☐ Nitrite ☐ Chloride ☐ Sulfate ☐ Bromide ☐ Fluoride ☐ Corrosivity ☐ Reactive CN ☐ Reactive S- ☐ Ignitibility/FP ☐ TCLP Metals ☐ TCLP VOC ☐ TCLP SVOC ☐ TCLP Pesticide Subcontract: ☐ TOC ☐ Grain Size ☐ TCLP Herbicides

Grab (G) or Composite (C)

TAT REQUESTED
Priority (24 hr)* ☐
Expedited (48 hr)* ☐
Standard (10 Business Days) ☒
*Date Needed

See absoluteresourceassociates.com for sample acceptance policy and current accreditation lists.

SPECIAL INSTRUCTIONS

REPORTING INSTRUCTIONS ☒ PDF (e-mail address) lcrawford@xdd-llc.com
☐ HARD COPY REQUIRED ☐ FAX (FAX#) ☐ OTHER (specify)

RECEIVED ON ICE ☒ YES ☐ NO
TEMPERATURE 7 °C

CUSTODY RECORD
QSD-01 Revision 12/23/10

	Date	Time		Date	Time
Relinquished by Sampler:	10/1/19	8:03	Received by:		
Relinquished by:			Received by:		
Relinquished by:			Received by Laboratory:	10/1/19	0803
			Way Bill#:		

Laboratory Report

Absolute Resource associates
124 Heritage Avenue Portsmouth NH 03801

Laurel Crawford
Xpert Design & Diagnostics, LLC
22 Marin Way
Unit 3
Stratham, NH 03885

PO Number: 4540
Job ID: 51313
Date Received: 11/22/19

Project: Medfield ZVI 19031

Attached please find results for the analysis of the samples received on the date referenced above.

Unless otherwise noted in the attached report, the analyses performed met the requirements of Absolute Resource Associates' Quality Assurance Plan. The Standard Operating Procedures are based upon USEPA SW-846, USEPA Methods for Chemical Analysis of Water and Wastewater, Standard Methods for the Examination of Water and Wastewater and other recognized methodologies. The results contained in this report pertain only to the samples as indicated on the chain of custody.

Absolute Resource Associates maintains certification with the agencies listed below.

We appreciate the opportunity to provide laboratory services. If you have any questions regarding the enclosed report, please contact the laboratory and we will be glad to assist you.

Sincerely,
Absolute Resource Associates

Jennifer Lowe
Laboratory Manager

Date of Approval: 12/5/2019
Total number of pages: 26

Absolute Resource Associates Certifications

New Hampshire	1732	Massachusetts	M-NH902
Maine	NH903		

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-001
Sample ID: Ctrl
Matrix: Solid Percent Dry: 87.6% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:50

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
chloromethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
vinyl chloride	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
bromomethane	< 0.15	0.15	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
chloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
trichlorofluoromethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
diethyl ether	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
acetone	< 1.5	1.5	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,1-dichloroethene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
methylene chloride	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
carbon disulfide	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
trans-1,2-dichloroethene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
isopropyl ether (DIPE)	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
ethyl t-butyl ether (ETBE)	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,1-dichloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
t-butanol (TBA)	< 1.5	1.5	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
2-butanone (MEK)	< 0.18	0.18	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
2,2-dichloropropane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
cis-1,2-dichloroethene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
chloroform	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
bromochloromethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
tetrahydrofuran (THF)	< 0.30	0.30	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,1,1-trichloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,1-dichloropropene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
t-amyl-methyl ether (TAME)	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
carbon tetrachloride	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,2-dichloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
benzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
trichloroethene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,2-dichloropropane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
bromodichloromethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,4-dioxane	< 1.5	1.5	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
dibromomethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.27	0.27	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
cis-1,3-dichloropropene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
toluene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
trans-1,3-dichloropropene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
2-hexanone	< 0.30	0.30	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,1,2-trichloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,3-dichloropropane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
tetrachloroethene	**8.0**	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
dibromochloromethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-001
Sample ID: Ctrl
Matrix: Solid Percent Dry: 87.6% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:50

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
1,2-dibromoethane (EDB)	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
chlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
ethylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
m&p-xylenes	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
o-xylene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
styrene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
bromoform	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
isopropylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,2,3-trichloropropane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
n-propylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
bromobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,3,5-trimethylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
2-chlorotoluene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
4-chlorotoluene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
tert-butylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,2,4-trimethylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
sec-butylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,3-dichlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
4-isopropyltoluene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,4-dichlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,2-dichlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
n-butylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,2,4-trichlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,3,5-trichlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
hexachlorobutadiene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
naphthalene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
1,2,3-trichlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**101**	78-114	%	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
toluene-D8 SUR	**108**	88-110	%	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
4-bromofluorobenzene SUR	**105**	86-115	%	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D
a,a,a-trifluorotoluene SUR	**114**	70-130	%	1	LMM	11/25/19	12280	12/2/19	18:41	SW5035A8260D

Absolute Resource associates

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-002
Sample ID: Ctrl Dup
Matrix: Solid Percent Dry: 90.6% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:55

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
chloromethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
vinyl chloride	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
bromomethane	< 0.15	0.15	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
chloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
trichlorofluoromethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
diethyl ether	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
acetone	< 1.5	1.5	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,1-dichloroethene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
methylene chloride	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
carbon disulfide	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
trans-1,2-dichloroethene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
isopropyl ether (DIPE)	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
ethyl t-butyl ether (ETBE)	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,1-dichloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
t-butanol (TBA)	< 1.5	1.5	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
2-butanone (MEK)	< 0.18	0.18	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
2,2-dichloropropane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
cis-1,2-dichloroethene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
chloroform	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
bromochloromethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
tetrahydrofuran (THF)	< 0.30	0.30	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,1,1-trichloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,1-dichloropropene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
t-amyl-methyl ether (TAME)	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
carbon tetrachloride	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,2-dichloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
benzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
trichloroethene	**0.10**	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,2-dichloropropane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
bromodichloromethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,4-dioxane	< 1.5	1.5	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
dibromomethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.27	0.27	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
cis-1,3-dichloropropene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
toluene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
trans-1,3-dichloropropene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
2-hexanone	< 0.30	0.30	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,1,2-trichloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,3-dichloropropane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
tetrachloroethene	**7.3**	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
dibromochloromethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-002
Sample ID: Ctrl Dup
Matrix: Solid Percent Dry: 90.6% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:55

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
1,2-dibromoethane (EDB)	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
chlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
ethylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
m&p-xylenes	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
o-xylene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
styrene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
bromoform	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
isopropylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,2,3-trichloropropane	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
n-propylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
bromobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,3,5-trimethylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
2-chlorotoluene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
4-chlorotoluene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
tert-butylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,2,4-trimethylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
sec-butylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,3-dichlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
4-isopropyltoluene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,4-dichlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,2-dichlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
n-butylbenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,2,4-trichlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,3,5-trichlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
hexachlorobutadiene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
naphthalene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
1,2,3-trichlorobenzene	< 0.060	0.060	ug/g	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**98**	78-114	%	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
toluene-D8 SUR	**107**	88-110	%	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
4-bromofluorobenzene SUR	**103**	86-115	%	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D
a,a,a-trifluorotoluene SUR	**102**	70-130	%	1	LMM	11/25/19	12280	12/2/19	19:07	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-003
Sample ID: Low ZVI
Matrix: Solid Percent Dry: 87.5% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:40

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
chloromethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
vinyl chloride	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
bromomethane	< 0.17	0.17	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
chloroethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
trichlorofluoromethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
diethyl ether	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
acetone	< 1.7	1.7	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,1-dichloroethene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
methylene chloride	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
carbon disulfide	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
trans-1,2-dichloroethene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
isopropyl ether (DIPE)	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
ethyl t-butyl ether (ETBE)	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,1-dichloroethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
t-butanol (TBA)	< 1.7	1.7	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
2-butanone (MEK)	< 0.20	0.20	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
2,2-dichloropropane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
cis-1,2-dichloroethene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
chloroform	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
bromochloromethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
tetrahydrofuran (THF)	< 0.34	0.34	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,1,1-trichloroethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,1-dichloropropene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
t-amyl-methyl ether (TAME)	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
carbon tetrachloride	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,2-dichloroethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
benzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
trichloroethene	**0.068**	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,2-dichloropropane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
bromodichloromethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,4-dioxane	< 1.7	1.7	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
dibromomethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.30	0.30	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
cis-1,3-dichloropropene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
toluene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
trans-1,3-dichloropropene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
2-hexanone	< 0.34	0.34	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,1,2-trichloroethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,3-dichloropropane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
tetrachloroethene	**5.6**	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
dibromochloromethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-003
Sample ID: Low ZVI
Matrix: Solid Percent Dry: 87.5% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:40

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
1,2-dibromoethane (EDB)	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
chlorobenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
ethylbenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
m&p-xylenes	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
o-xylene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
styrene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
bromoform	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
isopropylbenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,2,3-trichloropropane	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
n-propylbenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
bromobenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,3,5-trimethylbenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
2-chlorotoluene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
4-chlorotoluene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
tert-butylbenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,2,4-trimethylbenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
sec-butylbenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,3-dichlorobenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
4-isopropyltoluene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,4-dichlorobenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,2-dichlorobenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
n-butylbenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,2,4-trichlorobenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,3,5-trichlorobenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
hexachlorobutadiene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
naphthalene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
1,2,3-trichlorobenzene	< 0.067	0.067	ug/g	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**97**	78-114	%	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
toluene-D8 SUR	**104**	88-110	%	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
4-bromofluorobenzene SUR	**103**	86-115	%	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D
a,a,a-trifluorotoluene SUR	**111**	70-130	%	1	LMM	11/25/19	12280	12/2/19	19:32	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-004
Sample ID: Low ZVI Dup
Matrix: Solid Percent Dry: 85% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:45

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
chloromethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
vinyl chloride	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
bromomethane	< 0.18	0.18	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
chloroethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
trichlorofluoromethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
diethyl ether	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
acetone	< 1.8	1.8	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,1-dichloroethene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
methylene chloride	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
carbon disulfide	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
trans-1,2-dichloroethene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
isopropyl ether (DIPE)	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
ethyl t-butyl ether (ETBE)	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,1-dichloroethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
t-butanol (TBA)	< 1.8	1.8	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
2-butanone (MEK)	< 0.22	0.22	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
2,2-dichloropropane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
cis-1,2-dichloroethene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
chloroform	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
bromochloromethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
tetrahydrofuran (THF)	< 0.36	0.36	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,1,1-trichloroethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,1-dichloropropene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
t-amyl-methyl ether (TAME)	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
carbon tetrachloride	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,2-dichloroethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
benzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
trichloroethene	**0.099**	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,2-dichloropropane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
bromodichloromethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,4-dioxane	< 1.8	1.8	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
dibromomethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.33	0.33	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
cis-1,3-dichloropropene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
toluene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
trans-1,3-dichloropropene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
2-hexanone	< 0.36	0.36	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,1,2-trichloroethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,3-dichloropropane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
tetrachloroethene	**5.2**	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
dibromochloromethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-004
Sample ID: Low ZVI Dup
Matrix: Solid Percent Dry: 85% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:45

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
1,2-dibromoethane (EDB)	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
chlorobenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
ethylbenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
m&p-xylenes	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
o-xylene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
styrene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
bromoform	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
isopropylbenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,2,3-trichloropropane	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
n-propylbenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
bromobenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,3,5-trimethylbenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
2-chlorotoluene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
4-chlorotoluene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
tert-butylbenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,2,4-trimethylbenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
sec-butylbenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,3-dichlorobenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
4-isopropyltoluene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,4-dichlorobenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,2-dichlorobenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
n-butylbenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,2,4-trichlorobenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,3,5-trichlorobenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
hexachlorobutadiene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
naphthalene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
1,2,3-trichlorobenzene	< 0.073	0.073	ug/g	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**95**	78-114	%	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
toluene-D8 SUR	**107**	88-110	%	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
4-bromofluorobenzene SUR	**99**	86-115	%	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D
a,a,a-trifluorotoluene SUR	**124**	70-130	%	1	LMM	11/25/19	12280	12/2/19	19:58	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-005
Sample ID: High ZVI
Matrix: Solid Percent Dry: 83.6% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
chloromethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
vinyl chloride	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
bromomethane	< 0.20	0.20	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
chloroethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
trichlorofluoromethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
diethyl ether	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
acetone	< 2.0	2.0	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,1-dichloroethene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
methylene chloride	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
carbon disulfide	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
trans-1,2-dichloroethene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
isopropyl ether (DIPE)	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
ethyl t-butyl ether (ETBE)	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,1-dichloroethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
t-butanol (TBA)	< 2.0	2.0	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
2-butanone (MEK)	< 0.24	0.24	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
2,2-dichloropropane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
cis-1,2-dichloroethene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
chloroform	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
bromochloromethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
tetrahydrofuran (THF)	< 0.40	0.40	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,1,1-trichloroethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,1-dichloropropene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
t-amyl-methyl ether (TAME)	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
carbon tetrachloride	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,2-dichloroethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
benzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
trichloroethene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,2-dichloropropane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
bromodichloromethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,4-dioxane	< 2.0	2.0	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
dibromomethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.36	0.36	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
cis-1,3-dichloropropene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
toluene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
trans-1,3-dichloropropene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
2-hexanone	< 0.40	0.40	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,1,2-trichloroethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,3-dichloropropane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
tetrachloroethene	**2.5**	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
dibromochloromethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-005
Sample ID: High ZVI
Matrix: Solid Percent Dry: 83.6% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
1,2-dibromoethane (EDB)	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
chlorobenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
ethylbenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
m&p-xylenes	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
o-xylene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
styrene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
bromoform	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
isopropylbenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,2,3-trichloropropane	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
n-propylbenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
bromobenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,3,5-trimethylbenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
2-chlorotoluene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
4-chlorotoluene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
tert-butylbenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,2,4-trimethylbenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
sec-butylbenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,3-dichlorobenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
4-isopropyltoluene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,4-dichlorobenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,2-dichlorobenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
n-butylbenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,2,4-trichlorobenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,3,5-trichlorobenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
hexachlorobutadiene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
naphthalene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
1,2,3-trichlorobenzene	< 0.081	0.081	ug/g	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**97**	78-114	%	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
toluene-D8 SUR	**108**	88-110	%	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
4-bromofluorobenzene SUR	**101**	86-115	%	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D
a,a,a-trifluorotoluene SUR	**133** *	70-130	%	1	LMM	11/25/19	12280	12/2/19	20:24	SW5035A8260D

**** This surrogate is above the acceptance criteria.***

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-006
Sample ID: High ZVI Dup
Matrix: Solid Percent Dry: 84.4% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:10

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
chloromethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
vinyl chloride	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
bromomethane	< 0.19	0.19	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
chloroethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
trichlorofluoromethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
diethyl ether	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
acetone	< 1.9	1.9	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,1-dichloroethene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
methylene chloride	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
carbon disulfide	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
trans-1,2-dichloroethene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
isopropyl ether (DIPE)	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
ethyl t-butyl ether (ETBE)	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,1-dichloroethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
t-butanol (TBA)	< 1.9	1.9	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
2-butanone (MEK)	< 0.23	0.23	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
2,2-dichloropropane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
cis-1,2-dichloroethene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
chloroform	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
bromochloromethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
tetrahydrofuran (THF)	< 0.39	0.39	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,1,1-trichloroethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,1-dichloropropene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
t-amyl-methyl ether (TAME)	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
carbon tetrachloride	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,2-dichloroethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
benzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
trichloroethene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,2-dichloropropane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
bromodichloromethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,4-dioxane	< 1.9	1.9	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
dibromomethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.35	0.35	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
cis-1,3-dichloropropene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
toluene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
trans-1,3-dichloropropene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
2-hexanone	< 0.39	0.39	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,1,2-trichloroethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,3-dichloropropane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
tetrachloroethene	**3.2**	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
dibromochloromethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-006
Sample ID: High ZVI Dup
Matrix: Solid Percent Dry: 84.4% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:10

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
1,2-dibromoethane (EDB)	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
chlorobenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
ethylbenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
m&p-xylenes	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
o-xylene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
styrene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
bromoform	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
isopropylbenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,2,3-trichloropropane	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
n-propylbenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
bromobenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,3,5-trimethylbenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
2-chlorotoluene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
4-chlorotoluene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
tert-butylbenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,2,4-trimethylbenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
sec-butylbenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,3-dichlorobenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
4-isopropyltoluene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,4-dichlorobenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,2-dichlorobenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
n-butylbenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,2,4-trichlorobenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,3,5-trichlorobenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
hexachlorobutadiene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
naphthalene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
1,2,3-trichlorobenzene	< 0.077	0.077	ug/g	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**99**	78-114	%	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
toluene-D8 SUR	**107**	88-110	%	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
4-bromofluorobenzene SUR	**107**	86-115	%	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D
a,a,a-trifluorotoluene SUR	**130**	70-130	%	1	LMM	11/25/19	12280	12/2/19	20:50	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-007
Sample ID: Mid ZVI
Matrix: Solid Percent Dry: 84.7% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:20

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
chloromethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
vinyl chloride	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
bromomethane	< 0.19	0.19	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
chloroethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
trichlorofluoromethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
diethyl ether	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
acetone	< 1.9	1.9	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,1-dichloroethene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
methylene chloride	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
carbon disulfide	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
trans-1,2-dichloroethene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
isopropyl ether (DIPE)	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
ethyl t-butyl ether (ETBE)	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,1-dichloroethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
t-butanol (TBA)	< 1.9	1.9	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
2-butanone (MEK)	< 0.23	0.23	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
2,2-dichloropropane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
cis-1,2-dichloroethene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
chloroform	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
bromochloromethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
tetrahydrofuran (THF)	< 0.38	0.38	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,1,1-trichloroethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,1-dichloropropene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
t-amyl-methyl ether (TAME)	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
carbon tetrachloride	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,2-dichloroethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
benzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
trichloroethene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,2-dichloropropane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
bromodichloromethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,4-dioxane	< 1.9	1.9	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
dibromomethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.34	0.34	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
cis-1,3-dichloropropene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
toluene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
trans-1,3-dichloropropene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
2-hexanone	< 0.38	0.38	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,1,2-trichloroethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,3-dichloropropane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
tetrachloroethene	**2.9**	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
dibromochloromethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-007
Sample ID: Mid ZVI
Matrix: Solid Percent Dry: 84.7% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:20

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
1,2-dibromoethane (EDB)	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
chlorobenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
ethylbenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
m&p-xylenes	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
o-xylene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
styrene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
bromoform	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
isopropylbenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,2,3-trichloropropane	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
n-propylbenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
bromobenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,3,5-trimethylbenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
2-chlorotoluene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
4-chlorotoluene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
tert-butylbenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,2,4-trimethylbenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
sec-butylbenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,3-dichlorobenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
4-isopropyltoluene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,4-dichlorobenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,2-dichlorobenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
n-butylbenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,2,4-trichlorobenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,3,5-trichlorobenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
hexachlorobutadiene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
naphthalene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
1,2,3-trichlorobenzene	< 0.076	0.076	ug/g	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**99**	78-114	%	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
toluene-D8 SUR	**109**	88-110	%	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
4-bromofluorobenzene SUR	**106**	86-115	%	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D
a,a,a-trifluorotoluene SUR	**133** *	70-130	%	1	LMM	11/25/19	12280	12/2/19	21:16	SW5035A8260D

**** This surrogate is above the acceptance criteria.***

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-008
Sample ID: Mid ZVI Dup
Matrix: Solid Percent Dry: 85.8% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:30

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
chloromethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
vinyl chloride	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
bromomethane	< 0.18	0.18	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
chloroethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
trichlorofluoromethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
diethyl ether	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
acetone	< 1.8	1.8	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,1-dichloroethene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
methylene chloride	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
carbon disulfide	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
trans-1,2-dichloroethene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
isopropyl ether (DIPE)	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
ethyl t-butyl ether (ETBE)	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,1-dichloroethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
t-butanol (TBA)	< 1.8	1.8	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
2-butanone (MEK)	< 0.22	0.22	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
2,2-dichloropropane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
cis-1,2-dichloroethene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
chloroform	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
bromochloromethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
tetrahydrofuran (THF)	< 0.36	0.36	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,1,1-trichloroethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,1-dichloropropene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
t-amyl-methyl ether (TAME)	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
carbon tetrachloride	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,2-dichloroethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
benzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
trichloroethene	**0.17**	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,2-dichloropropane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
bromodichloromethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,4-dioxane	< 1.8	1.8	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
dibromomethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.33	0.33	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
cis-1,3-dichloropropene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
toluene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
trans-1,3-dichloropropene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
2-hexanone	< 0.36	0.36	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,1,2-trichloroethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,3-dichloropropane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
tetrachloroethene	**4.0**	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
dibromochloromethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-008
Sample ID: Mid ZVI Dup
Matrix: Solid Percent Dry: 85.8% Results expressed on a dry weight basis.
Sampled: 11/21/19 16:30

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
1,2-dibromoethane (EDB)	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
chlorobenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
ethylbenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
m&p-xylenes	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
o-xylene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
styrene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
bromoform	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
isopropylbenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,2,3-trichloropropane	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
n-propylbenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
bromobenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,3,5-trimethylbenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
2-chlorotoluene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
4-chlorotoluene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
tert-butylbenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,2,4-trimethylbenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
sec-butylbenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,3-dichlorobenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
4-isopropyltoluene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,4-dichlorobenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,2-dichlorobenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
n-butylbenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,2,4-trichlorobenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,3,5-trichlorobenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
hexachlorobutadiene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
naphthalene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
1,2,3-trichlorobenzene	< 0.072	0.072	ug/g	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**96**	78-114	%	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
toluene-D8 SUR	**108**	88-110	%	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
4-bromofluorobenzene SUR	**105**	86-115	%	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D
a,a,a-trifluorotoluene SUR	**129**	70-130	%	1	LMM	11/25/19	12280	12/2/19	21:42	SW5035A8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-009
Sample ID: Ctrl
Matrix: Water
Sampled: 11/21/19 16:50

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
chloromethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
vinyl chloride	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
bromomethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
chloroethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
trichlorofluoromethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
diethyl ether	< 1000	1000	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
acetone	< 10000	10000	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,1-dichloroethene	< 200	200	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
methylene chloride	< 1000	1000	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
carbon disulfide	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
methyl t-butyl ether (MTBE)	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
trans-1,2-dichloroethene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
isopropyl ether (DIPE)	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
ethyl t-butyl ether (ETBE)	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,1-dichloroethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
t-butanol (TBA)	< 6000	6000	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
2-butanone (MEK)	< 2000	2000	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
2,2-dichloropropane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
cis-1,2-dichloroethene	**780**	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
chloroform	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
bromochloromethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
tetrahydrofuran (THF)	< 2000	2000	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,1,1-trichloroethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,1-dichloropropene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
t-amyl-methyl ether (TAME)	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
carbon tetrachloride	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,2-dichloroethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
benzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
trichloroethene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,2-dichloropropane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
bromodichloromethane	< 120	120	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,4-dioxane	< 10000	10000	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
dibromomethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
4-methyl-2-pentanone (MIBK)	< 2000	2000	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
cis-1,3-dichloropropene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
toluene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
trans-1,3-dichloropropene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
2-hexanone	< 2000	2000	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,1,2-trichloroethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,3-dichloropropane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
tetrachloroethene	**59000**	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
dibromochloromethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-009
Sample ID: Ctrl
Matrix: Water
Sampled: 11/21/19 16:50

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
1,2-dibromoethane (EDB)	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
chlorobenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,1,1,2-tetrachloroethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
ethylbenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
m&p-xylenes	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
o-xylene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
styrene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
bromoform	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
isopropylbenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,1,2,2-tetrachloroethane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,2,3-trichloropropane	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
n-propylbenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
bromobenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,3,5-trimethylbenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
2-chlorotoluene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
4-chlorotoluene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
tert-butylbenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,2,4-trimethylbenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
sec-butylbenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,3-dichlorobenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
4-isopropyltoluene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,4-dichlorobenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,2-dichlorobenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
n-butylbenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,2-dibromo-3-chloropropane (DBCP)	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,2,4-trichlorobenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,3,5-trichlorobenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
hexachlorobutadiene	< 100	100	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
naphthalene	< 1000	1000	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
1,2,3-trichlorobenzene	< 400	400	ug/L	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**103**	78-114	%	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
toluene-D8 SUR	**104**	88-110	%	200	LMM		1903707	11/26/19	5:53	SW5030C8260D
4-bromofluorobenzene SUR	**98**	86-115	%	200	LMM		1903707	11/26/19	5:53	SW5030C8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-010
Sample ID: Low ZVI
Matrix: Water
Sampled: 11/21/19 16:40

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
chloromethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
vinyl chloride	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
bromomethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
chloroethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
trichlorofluoromethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
diethyl ether	< 500	500	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
acetone	< 5000	5000	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,1-dichloroethene	< 100	100	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
methylene chloride	< 500	500	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
carbon disulfide	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
methyl t-butyl ether (MTBE)	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
trans-1,2-dichloroethene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
isopropyl ether (DIPE)	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
ethyl t-butyl ether (ETBE)	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,1-dichloroethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
t-butanol (TBA)	< 3000	3000	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
2-butanone (MEK)	< 1000	1000	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
2,2-dichloropropane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
cis-1,2-dichloroethene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
chloroform	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
bromochloromethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
tetrahydrofuran (THF)	< 1000	1000	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,1,1-trichloroethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,1-dichloropropene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
t-amyl-methyl ether (TAME)	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
carbon tetrachloride	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,2-dichloroethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
benzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
trichloroethene	**550**	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,2-dichloropropane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
bromodichloromethane	< 60	60	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,4-dioxane	< 5000	5000	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
dibromomethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
4-methyl-2-pentanone (MIBK)	< 1000	1000	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
cis-1,3-dichloropropene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
toluene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
trans-1,3-dichloropropene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
2-hexanone	< 1000	1000	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,1,2-trichloroethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,3-dichloropropane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
tetrachloroethene	**21000**	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
dibromochloromethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-010
Sample ID: Low ZVI
Matrix: Water
Sampled: 11/21/19 16:40

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
1,2-dibromoethane (EDB)	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
chlorobenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,1,1,2-tetrachloroethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
ethylbenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
m&p-xylenes	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
o-xylene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
styrene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
bromoform	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
isopropylbenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,1,2,2-tetrachloroethane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,2,3-trichloropropane	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
n-propylbenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
bromobenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,3,5-trimethylbenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
2-chlorotoluene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
4-chlorotoluene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
tert-butylbenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,2,4-trimethylbenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
sec-butylbenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,3-dichlorobenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
4-isopropyltoluene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,4-dichlorobenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,2-dichlorobenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
n-butylbenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,2-dibromo-3-chloropropane (DBCP)	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,2,4-trichlorobenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,3,5-trichlorobenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
hexachlorobutadiene	< 50	50	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
naphthalene	< 500	500	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
1,2,3-trichlorobenzene	< 200	200	ug/L	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**106**	78-114	%	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
toluene-D8 SUR	**103**	88-110	%	100	LMM		1903706	11/25/19	16:26	SW5030C8260D
4-bromofluorobenzene SUR	**98**	86-115	%	100	LMM		1903706	11/25/19	16:26	SW5030C8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-011
Sample ID: High ZVI
Matrix: Water
Sampled: 11/21/19 16:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
chloromethane	**47**	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
vinyl chloride	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
bromomethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
chloroethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
trichlorofluoromethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
diethyl ether	< 50	50	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
acetone	< 500	500	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,1-dichloroethene	< 10	10	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
methylene chloride	< 50	50	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
carbon disulfide	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
methyl t-butyl ether (MTBE)	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
trans-1,2-dichloroethene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
isopropyl ether (DIPE)	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
ethyl t-butyl ether (ETBE)	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,1-dichloroethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
t-butanol (TBA)	< 300	300	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
2-butanone (MEK)	< 100	100	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
2,2-dichloropropane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
cis-1,2-dichloroethene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
chloroform	**28**	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
bromochloromethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
tetrahydrofuran (THF)	< 100	100	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,1,1-trichloroethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,1-dichloropropene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
t-amyl-methyl ether (TAME)	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
carbon tetrachloride	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,2-dichloroethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
benzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
trichloroethene	**230**	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,2-dichloropropane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
bromodichloromethane	< 6.0	6.0	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,4-dioxane	< 500	500	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
dibromomethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
4-methyl-2-pentanone (MIBK)	< 100	100	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
cis-1,3-dichloropropene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
toluene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
trans-1,3-dichloropropene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
2-hexanone	< 100	100	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,1,2-trichloroethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,3-dichloropropane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
tetrachloroethene	**4200**	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
dibromochloromethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-011
Sample ID: High ZVI
Matrix: Water
Sampled: 11/21/19 16:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
1,2-dibromoethane (EDB)	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
chlorobenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,1,1,2-tetrachloroethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
ethylbenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
m&p-xylenes	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
o-xylene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
styrene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
bromoform	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
isopropylbenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,1,2,2-tetrachloroethane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,2,3-trichloropropane	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
n-propylbenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
bromobenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,3,5-trimethylbenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
2-chlorotoluene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
4-chlorotoluene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
tert-butylbenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,2,4-trimethylbenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
sec-butylbenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,3-dichlorobenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
4-isopropyltoluene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,4-dichlorobenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,2-dichlorobenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
n-butylbenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,2-dibromo-3-chloropropane (DBCP)	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,2,4-trichlorobenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,3,5-trichlorobenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
hexachlorobutadiene	< 5.0	5.0	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
naphthalene	< 50	50	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
1,2,3-trichlorobenzene	< 20	20	ug/L	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**102**	78-114	%	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
toluene-D8 SUR	**98**	88-110	%	10	LMM		1903706	11/25/19	14:41	SW5030C8260D
4-bromofluorobenzene SUR	**95**	86-115	%	10	LMM		1903706	11/25/19	14:41	SW5030C8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-012
Sample ID: Mid ZVI
Matrix: Water
Sampled: 11/21/19 16:20

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
chloromethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
vinyl chloride	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
bromomethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
chloroethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
trichlorofluoromethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
diethyl ether	< 250	250	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
acetone	< 2500	2500	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,1-dichloroethene	< 50	50	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
methylene chloride	< 250	250	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
carbon disulfide	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
methyl t-butyl ether (MTBE)	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
trans-1,2-dichloroethene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
isopropyl ether (DIPE)	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
ethyl t-butyl ether (ETBE)	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,1-dichloroethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
t-butanol (TBA)	< 1500	1500	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
2-butanone (MEK)	< 500	500	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
2,2-dichloropropane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
cis-1,2-dichloroethene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
chloroform	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
bromochloromethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
tetrahydrofuran (THF)	< 500	500	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,1,1-trichloroethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,1-dichloropropene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
t-amyl-methyl ether (TAME)	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
carbon tetrachloride	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,2-dichloroethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
benzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
trichloroethene	**770**	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,2-dichloropropane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
bromodichloromethane	< 30	30	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,4-dioxane	< 2500	2500	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
dibromomethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
4-methyl-2-pentanone (MIBK)	< 500	500	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
cis-1,3-dichloropropene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
toluene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
trans-1,3-dichloropropene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
2-hexanone	< 500	500	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,1,2-trichloroethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,3-dichloropropane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
tetrachloroethene	**8800**	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
dibromochloromethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D

Project ID: Medfield ZVI 19031
Job ID: 51313
Sample#: 51313-012
Sample ID: Mid ZVI
Matrix: Water
Sampled: 11/21/19 16:20

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
1,2-dibromoethane (EDB)	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
chlorobenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,1,1,2-tetrachloroethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
ethylbenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
m&p-xylenes	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
o-xylene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
styrene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
bromoform	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
isopropylbenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,1,2,2-tetrachloroethane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,2,3-trichloropropane	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
n-propylbenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
bromobenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,3,5-trimethylbenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
2-chlorotoluene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
4-chlorotoluene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
tert-butylbenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,2,4-trimethylbenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
sec-butylbenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,3-dichlorobenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
4-isopropyltoluene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,4-dichlorobenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,2-dichlorobenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
n-butylbenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,2-dibromo-3-chloropropane (DBCP)	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,2,4-trichlorobenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,3,5-trichlorobenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
hexachlorobutadiene	< 25	25	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
naphthalene	< 250	250	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
1,2,3-trichlorobenzene	< 100	100	ug/L	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**101**	78-114	%	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
toluene-D8 SUR	**102**	88-110	%	50	LMM		1903706	11/25/19	15:59	SW5030C8260D
4-bromofluorobenzene SUR	**98**	86-115	%	50	LMM		1903706	11/25/19	15:59	SW5030C8260D

Absolute Resource associates
124 Heritage Avenue #16
Portsmouth, NH 03801
603-436-2001
absoluteresourceassociates.com

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

51313

Company Name: XDD

Company Address:

Report To:

Phone #:

Invoice to:

Email:

PO #: 4540

Project Name: NHDES Southern Medfield ZVI js 11/25/19 per Laurel

Project #: 19016.0-01 19031

Project Location: (NH) MA ME VT

Accreditation Required? N/Y:

Protocol: RCRA SDWA NPDES MCP NHDES DOD

Reporting Limits: QAPP GW-1 S-1 EPA DW Other

Quote #

❑ NH Reimbursement Pricing

ANALYSIS REQUEST

❑ VOC 8260 ❑ VOC 8260 NHDES ❑ VOC 8260 MADEP ❑ VOC 624.1 ❑ VOC BTEX MtBE, only ❑ VOC 8021VT ❑ VPH MADEP ❑ GRO 8015 ❑ 1,4-Dioxane ❑ VOC 524.2 ❑ VOC 524.2 NH List ❑ Gases-List: ❑ TPH ❑ DRO 8015 ❑ EPH MADEP ❑ TPH Fingerprint ❑ 8270PAH ❑ 8270ABN ❑ 625.1 ❑ EDB ❑ 8082 PCB ❑ 8081 Pesticides ❑ 608.3 Pest/PCB ❑ O&G 1664 ❑ Mineral O&G 1664 ❑ pH ❑ BOD ❑ Conductivity ❑ Turbidity ❑ Apparent Color ❑ TSS ❑ TDS ❑ TS ❑ TVS ❑ Alkalinity ❑ Acidity ❑ RCRA Metals ❑ Priority Pollutant Metals ❑ TAL Metals ❑ Hardness ❑ Total Metals-list: ❑ Dissolved Metals-list: ❑ Ammonia ❑ COD ❑ TKN ❑ TN ❑ TON ❑ TOC ❑ Ferrous Iron ❑ T-Phosphorus ❑ Bacteria P/A ❑ Bacteria MPN ❑ Enterococci ❑ Cyanide ❑ Sulfide ❑ Nitrate + Nitrite ❑ Ortho P ❑ Phenols ❑ Nitrate ❑ Nitrite ❑ Chloride ❑ Sulfate ❑ Bromide ❑ Fluoride ❑ Corrosivity ❑ Reactive CN ❑ Reactive S- ❑ Ignitibility/FP ❑ TCLP Metals ❑ TCLP VOC ❑ TCLP SVOC ❑ TCLP Pesticide Subcontract: ❑ Grain Size ❑ Herbicides ❑ Asbestos ❑ PFAS

Grab (G) or Composite (C)

Lab Sample ID (Lab Use Only)	Field ID	# CONTAINERS	Matrix: WATER	SOLID	OTHER	Preservation Method: HCl	HNO_3	H_2SO_4	NaOH	MeOH	Sampling: DATE	TIME	SAMPLER	VOC 8260	Grab (G) or Composite (C)
51313-01	Ctrl		X	X		X				X	11/21/19	1650	LC	X	G
-02	Ctrl Dup			X						X		1655			G
-03	Low ZVI		X	X		X				X		1640			G
-04	Low ZVI dup			X						X		1645			G
-05	High ZVI		X	X		X				X		1600			G
-06	High ZVI dup			X						X		1610			G
-07	Mid ZVI		X	X		X				X		1620			G
-08	Mid ZVI dup			X						X		1630			G
-09	Ctrl		X			X					11/21/19	16:50		X	G
-10	Low ZVI		X			X						16:40		X	G
-11	High ZVI		X			X						16:00		X	G

AD spike from waters & solids

TAT REQUESTED
Priority (24 hr)* ❑
Expedited (48 hr)* ❑
Standard ☒ (10 Business Days)
*Date Needed

See absoluteresourceassociates.com for sample acceptance policy and current accreditation lists.

SPECIAL INSTRUCTIONS Note-only 1 voa provided for Mid ZVI and High ZVI groundwater samples -12 Mid ZVI water VOC 8260 11/21/19 16:20

REPORTING INSTRUCTIONS ❑ PDF (e-mail address) ❑ HARD COPY REQUIRED ❑ EDD

RECEIVED ON ICE ☒YES ❑NO

TEMPERATURE -1 °C

CUSTODY RECORD
QSD-01 Revision 11/08/18

	Date	Time		Date	Time
Relinquished by Sampler:	11/22/19	1335	Received by:	11-22	1:35
Relinquished by:	11-22	14:36	Received by:		
Relinquished by:			Received by Laboratory:	11/22/19	14:36

June 26, 2020 *Via E-Mail* (KurkjianD@wseinc.com)

Mr. Daron Kurkjian, P.E.
Project Manager
Weston & Sampson, Inc.
85 Devonshire Street, 3rd Floor
Boston, MA 02109

RE: Bench Scale Testing Results – Supplemental Evaluation
Former Medfield State Hospital Site, Medfield, MA
XDD Project No. 19039.01

Dear Mr. Kurkjian,

XDD ENVIRONMENTAL, LLC (XDD) is pleased to submit this report to Weston & Sampson, Inc. (W&S) summarizing the results of the supplemental bench scale testing in support of the proposed remediation activities at the Former Medfield State Hospital Site, located in Medfield, Massachusetts (Site).

The supplemental bench scale testing was performed in general accordance with the scope of work (SOW) described in XDD's *"Proposed Scope of Work for Bench Scale Testing Services" (Proposal)* dated September 4, 2019 and W&S's "Amendment No. 2" dated April 14, 2020. This report contains results of the supplemental phase of bench testing of Zero Valent Iron (ZVI) technology using higher dosing levels Ferox® Flow ZVI powder for a potential permeable reactive barrier (PRB) installation at the Site.

1.0 INTRODUCTION AND BACKGROUND

Delineation efforts conducted by W&S have identified a proposed remediation target area at the Site. The target area covers approximately 11,000 square feet and is between approximately 8 and 20 feet below surface grade (ft bgs). Soils are reportedly glacial till comprised primarily of sand and gravel. The contaminants of concern (COCs) are chlorinated volatile organic compounds (CVOCs), primarily tetrachloroethene (PCE) which is present in this area at up to 5.1

milligrams per kilogram (mg/kg) at soil boring SB-G6-10-15', and up to 2,500 micrograms per Liter (μg/L) in groundwater at soil boring SB-F6.

Excavation of the upper 8 to 10 feet of soils followed by soil blending and addition of chemical oxidants (sodium persulfate or potassium permanganate are being considered) is currently being proposed as the remediation technique. Activated carbon (Plumestop® by Regenesis, Inc.) was also being proposed to be added to the downgradient portion of the target area to form a barrier against migration of any remaining low-level impacts following treatment.

Note soil blending has not begun and is planned for later in 2020. Based on the improved contact possible through soil blending, XDD recommended that ZVI technology be considered as an alternative to In Situ Chemical Oxidation (ISCO[1]). ZVI has the potential to directly treat the source area impacts while also providing a long-term barrier against migration. ZVI is a proven technology that is very effective for the target COCs and can remain active for years to decades.

1.1 REVIEW OF PRIOR ZVI BENCH TESTING (JANUARY 2020)

XDD previously conducted a bench scale test using ZVI and results were presented in "*Bench Scale Testing Results, Former Medfield State Hospital Site, Medfield, MA*" by XDD, dated January 20, 2020.

XDD tested ZVI loadings of 0.4%, 1.5%, and 3.0% by weight during the prior bench testing. The results of the bench testing indicated up to 83% of the mass of total VOCs were degraded by ZVI at these loadings. Follow-up soil and groundwater sampling was conducted by W&S to screen for potential interferences/scavengers that may have affected the ZVI performance (e.g., high levels of sulfate or nitrates can consume ZVI capacity, etc.).

Based upon a review of the available data, there did not appear to be any obvious or significant geochemical interferences that could impact the ZVI technology at this Site. Therefore, use of slightly higher ZVI loadings was considered as a conservative measure to ensure complete

[1] XDD conducted bench testing (2013) to evaluate sodium persulfate ISCO technologies for application at this Site. Soil oxidant demand and total oxidant demand ranged from 0.3 grams per kilogram (g/Kg) to 8.8 g/Kg depending on the activation methods employed. Carus Corporation (Carus) conducted additional bench testing of permanganate and persulfate technology (2015). Carus determined a similar range of oxidant demands between 1.02 g/Kg and 9.98 g/Kg depending on the technology.

destruction of the target COCs and persistence of the ZVI under Site-specific conditions, if used for full-scale.

The objective of the supplemental bench evaluation was to confirm that the higher loadings of ZVI would result in a greater reduction in total VOCs. The ZVI loadings were increased to 4.0% and 6.0% in the supplemental testing. This report focuses on the approach and results of the supplemental bench testing.

1.2 ZERO VALENT IRON TECHNOLOGY REVIEW

ZVI (Fe^0) is considered a chemical reducing agent which can initiate an abiotic oxidation-reduction reaction (or an electron transfer). When PCE, or other ions/molecules like oxygen (i.e., the "oxidizing agent"), comes into contact with ZVI, the ZVI loses electrons and PCE gains electrons. This electron transfer causes the breakdown of PCE[2]. As the ZVI is exposed to target contaminants, as well as other non-target constituents in the groundwater, the ZVI surface will eventually become oxidized (typically forming surficial ferric oxide or ferric oxyhydroxide). This can be seen visually as corrosion or rust formation on the surface of the ZVI. As the iron oxide film forms on the surface of the ZVI particle, it will start to impact the performance of the ZVI. This oxidation-reduction process will lead to the eventual passivation of the ZVI surface, at which point the capacity of the ZVI will be exhausted.

Many other compounds exist within an aquifer besides oxygen and the target contaminant (PCE) which can form precipitates or coatings on the surface of the ZVI. Under certain geochemical conditions within an aquifer, high levels of sulfates, nitrates, carbonates/hardness, organic material (such as total organic carbon [TOC] or humic acids), etc. can all exert a demand on the ZVI or coat the surface, resulting in premature passivation or fouling.

The key to successful remediation using ZVI is to ensure that non-target constituents do not prematurely passivate the ZVI, or to provide enough ZVI so that it can satisfy the long-term demand and remain active for many years.

[2] PCE is hypothesized to breakdown primarily through a number of intermediate acetylene compounds via the β-elimination pathway, although other reactions may occur (hydrogenolysis and hydrolysis reactions). Hydrogen (H^+) is also released during this reaction which can aid biological activity.

1.3 PRIOR ISCO TREATMENTS

According to information provided to XDD, three full-scale ISCO injection events were conducted at the Site (February 2014, May 2014, and November 2014/January 2015). These oxidant treatments were conducted using sodium persulfate ($Na_2S_2O_8$) and sodium hydroxide (NaOH) which is also known as Alkaline Activated Persulfate (AAP) technology. A limited amount of potassium permanganate ($KMnO_4$) was also applied.

Both oxidants will create oxidized constituents within soil and may release other dissolved constituents (such as sulfate) which can then potentially exert additional demand upon the ZVI and cause premature passivation.

2.0 BENCH SCALE TESTING

The objective of the supplemental bench test was to confirm that a higher loading of ZVI would be able to achieve higher PCE mass destruction. The testing was also intended to confirm that the higher ZVI loading would be sufficient to overcome any naturally occurring geochemical interferences that could prematurely passivate the ZVI.

2.1 SOIL AND GROUNDWATER SAMPLES

Soil and groundwater used in the supplemental bench testing was collected from the site by W&S on March 16, 2020 and April 22, 2020, respectively. Upon receipt of soil and groundwater samples at XDD's laboratory, the soil was homogenized, and small rocks were removed. This was conducted as efficiently as possible to minimize volatilization of contaminants.

2.2 COC SPIKING

For consistency with the previous bench test, the homogenized soil was spiked with PCE using a vapor deposition procedure to target a final soil concentration of approximately 5 mg/kg PCE (after any expected partitioning into groundwater)[3]. Soil used in the Geochemical

[3] Baseline data from the soil used in the first bench scale testing indicated non-detect levels of PCE compared to historical data (up to 5.1 mg/kg at SB-G6-10-15'), suggesting that the samples were not representative of the maximum COC impacts to be treated. Therefore, after consultation with W&S, it was agreed that XDD would spike the soil that would be used in the Phase 2 tests to target approximately 5 mg/kg of PCE, which is the maximum soil concentration that has been detected within the identified source area of the Site.

Parameter/Phase 1 tests was not spiked since these tests focused on the geochemical interaction of ZVI with the soils, not the contaminant.

2.3 ZVI POWDER PRODUCT

Hepure Remediation Products (www.Hepure.com) is a supplier of remediation grade ZVI products that are high quality and purity (95% pure ZVI, free of residual oils, consistent particle size ranges, etc.). The following Hepure ZVI product was used in the bench testing:

1. Ferox Flow ZVI Powder (Ferox Flow):
    a. -100/+325 Mesh ZVI (~125-micron average particle size)
    b. Typically used in treatment of source area soils due to high surface area/activity.

This is the same material that was used in the prior bench scale testing by XDD.

2.4 TEST METHODS

The tests were conducted in duplicate in a series of batch reactors (40-milliliter [mL] borosilicate-glass unless otherwise specified) at 70 degrees Fahrenheit (°F). Approximately two pore volumes of groundwater were applied to the soil unless otherwise noted. Identical control reactors were set up in each phase and carried through the same procedures as the test reactors.

- **Phase 1 – Geochemical Testing**: Phase 1 was conducted using two loading ranges of Ferox Flow (4.0% and 6.0%). Phase 1 was conducted by measuring the pH and Oxidation Reduction Potential (ORP) in the batch reactors containing ZVI in contact with soil and groundwater. The pH and ORP of the groundwater/soil reactors were monitored to determine the effect of the ZVI addition. The ZVI loading should be adequate to result in a significant reduction in ORP. Changes in ORP/pH were monitored for 6 days to evaluate aging of the ZVI over time. ORP/pH readings were measured in XDD's laboratory.

- **Phase 2 – Contaminant Destruction Testing**: The ZVI dosing in Phase 2 was also conducted at 4.0% and 6.0% of Ferox Flow (the increased ZVI loadings were selected based on the results of the initial bench scale testing). After a 6-week reaction time, the reactors were submitted to Absolute Resource Associates, LLC (ARA) for the analysis of VOCs in soil and groundwater.

3.0 SUPPLEMENTAL TESTING RESULTS

3.1 PHASE 1 – GEOCHEMICAL TESTING

The pH and ORP of the groundwater/soil reactor was monitored to determine the effect of the ZVI addition; results are presented on **Figures 1 and 2**, respectively.

The pH results in **Figure 1** show that for all test conditions, pH gradually increased with time. This was expected, as it is typical for the pH to be alkaline in a ZVI application. The pH remained within the acceptable range for ZVI technology.

The ORP results in **Figure 2** show that both doses of the Ferox Flow achieved significantly reducing conditions. After one hour of ZVI addition, the ORP dropped to approximately -300 mV, which further decreased to -450 mV or lower after 4 hours and remained low throughout the remainder of the test period. This was a lower ORP than was observed during the initial bench testing (conducted at 0.4%, 1.5%, and 3.0% ZVI loadings), which is consistent with the higher loadings of ZVI used in this test.

3.2 PHASE 2 – CONTAMINANT DESTRUCTION TESTING

The Phase 2 contaminant destruction testing was conducted at 4.0% and 6.0% loadings of Ferox® Flow. The analytical results for the soil and groundwater are presented on **Tables 1 through 3**.

- **Controls:** Control reactor vials were monitored to assess potential losses of target VOCs during the test and were compared directly to the treated reactors to evaluate contaminant destruction. The data show slightly lower concentrations of PCE in the spiked control reactors than targeted for soil (4.5 mg/kg average of duplicates [**Table 1**] versus the targeted 5 mg/kg spike level). This is attributed to normal volatile losses during the spiking procedure and transfer to individual batch reactors, as well as phase partitioning of the PCE from the soil into the aqueous phase.

  The dissolved concentration of PCE was 12,740 μg/L in the control sample (**Table 2**). This concentration is significantly higher than the maximum dissolved PCE concentration detected at the Site (i.e., up to 2,500 μg/L PCE detected at soil boring SB-F6).

- **ZVI Test Reactor Results:**
  - **Soil Concentration Reductions**: Compared to the controls, total VOCs concentrations in soil were reduced to non-detect levels in the 4.0% and 6.0% ZVI test conditions (**Table 1**).
  - **Groundwater Concentration Reductions**: Total VOCs in groundwater were reduced by greater than 99% (from 12,740 μg/L PCE in the control to 52J[4] μg/L and 22J[4] μg/L in the 4.0% and 6.0% ZVI test conditions, respectively) (**Table 2**).
  - **Total COCs Reductions**: The 4.0% and 6.0% ZVI treatments resulted in a greater than 99% reduction in total VOCs mass (total of dissolved mass within the groundwater and adsorbed mass on the soil) within the batch reactors (**Table 3**).

Residual PCE Remaining In Dissolved Phase: It was noted that the low "J-qualified" values for dissolved PCE concentrations associated with the 4.0% and 6.0% ZVI test reactors (52J and 22J μg/L, respectively) are above the GW-1 (5 μg/L) and GW-2 (50 μg/L) MCP standards for PCE.

These tests were performed using soils that contained on average 4.5 mg/Kg PCE on soil (comparable to the maximum PCE soil concentration detected on Site of 5.1 mg/Kg). However, the PCE concentration in groundwater in the test reactors was approximately 5 times greater than the maximum detection on Site (i.e., the control samples contained 12,740 μg/L PCE compared to the maximum Site concentration of 2,500 μg/L).

Since the majority of the target area for full-scale treatment exhibits far lower soil/groundwater concentrations that what was tested, it reasonable to anticipate that a conservative dose of 4% ZVI would be adequate over the entire area on average. Conceptually, even if the ZVI capacity is fully utilized within limited portions of the target soil volume, there would still remain a large

4 The laboratory "J-qualified" this data and suggested that these detections may have been partially attributed to potential carryover from the prior analysis of the relatively high-concentration control sample. The control sample (with a PCE detection of 12,740 μg/L) was verified to have been run immediately before the samples exhibiting these "J-qualified" values, and so this was considered a possibility. However, in order to confirm these observations, XDD submitted a remaining set of reactor samples that were left over from the 4% and 6% trials (results are noted in Table 2). While these additional reactors had been sitting for an additional period and had experienced additional losses of PCE (due to ongoing ZVI reaction and also due to potential volatilization), the results of these additional analyses confirmed that low levels of PCE were in fact remaining at the end of the test. Therefore, it was confirmed that the "J-qualified" values for PCE are likely representative of the potential PCE levels remaining at the end of the initial reaction period and are not attributable to laboratory carryover.

volume of active ZVI within the less impacted/adjacent treated area that should, with extended contact time, reduce the remaining PCE closer to the remediation goals.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The bench scale data support the following conclusions and recommendations:

- The Phase 1 results indicate that Ferox Flow ZVI loadings of 4.0% and 6.0% achieved adequate reductions in ORP.

- The Phase 2 results suggest that Ferox Flow ZVI powder is a viable technology for direct source treatment of PCE via soil mixing.
    - The 4.0% and 6.0% ZVI loadings during this supplemental bench test resulted in greater than 99% reduction in total VOCs mass.
    - The ZVI treatment from the previous bench resulted in 52%, 74%, and 83% reduction in total VOCs mass for the 0.4%, 1.5%, and 3.0% ZVI loadings, respectively.

- For conservatism, XDD would recommend a minimum ZVI dosage of 4.0% ZVI for a potential full-scale application.

- During this supplemental test (and during the prior bench testing with lower ZVI loadings), the performance of the ZVI was tested under conservative contaminant loading conditions. Soil concentrations in the bench tests were similar to the maximum PCE concentrations detected on Site, but the dissolved concentrations of PCE in the bench tests were over 5 times higher than the maximum dissolved concentrations detected on Site. The majority of the actual target area on Site does not appear to exhibit contaminant levels of this magnitude according to available data, and so the bench testing results should be considered conservative.

- These tests suggested that there is a potential for low-levels of dissolved PCE to remain within limited portions of the source area that exhibit the highest PCE concentrations. However in practice it is reasonable to expect that with uniform ZVI loading across the full target area, and with extended contact time, the probability remains high that PCE will be reduced to the desired treatment goals in the majority of the treatment area.

XDD appreciates the opportunity to be of assistance to W&S on this important project. Please do not hesitate to call me at 603-778-1100 should you have any questions on the contents of this report.

Sincerely,

XDD ENVIRONMENTAL, LLC

Scott C. Crawford, P.E. (Licensed in NH, WV, and NJ)
Sr. Project Manager

Cc: Laurel Crawford, XDD
Mike Marley, XDD
File

FIGURES

Figure 1
Phase 1 pH Results
Former Medfield State Hospital Site
Medfield, Massachusetts

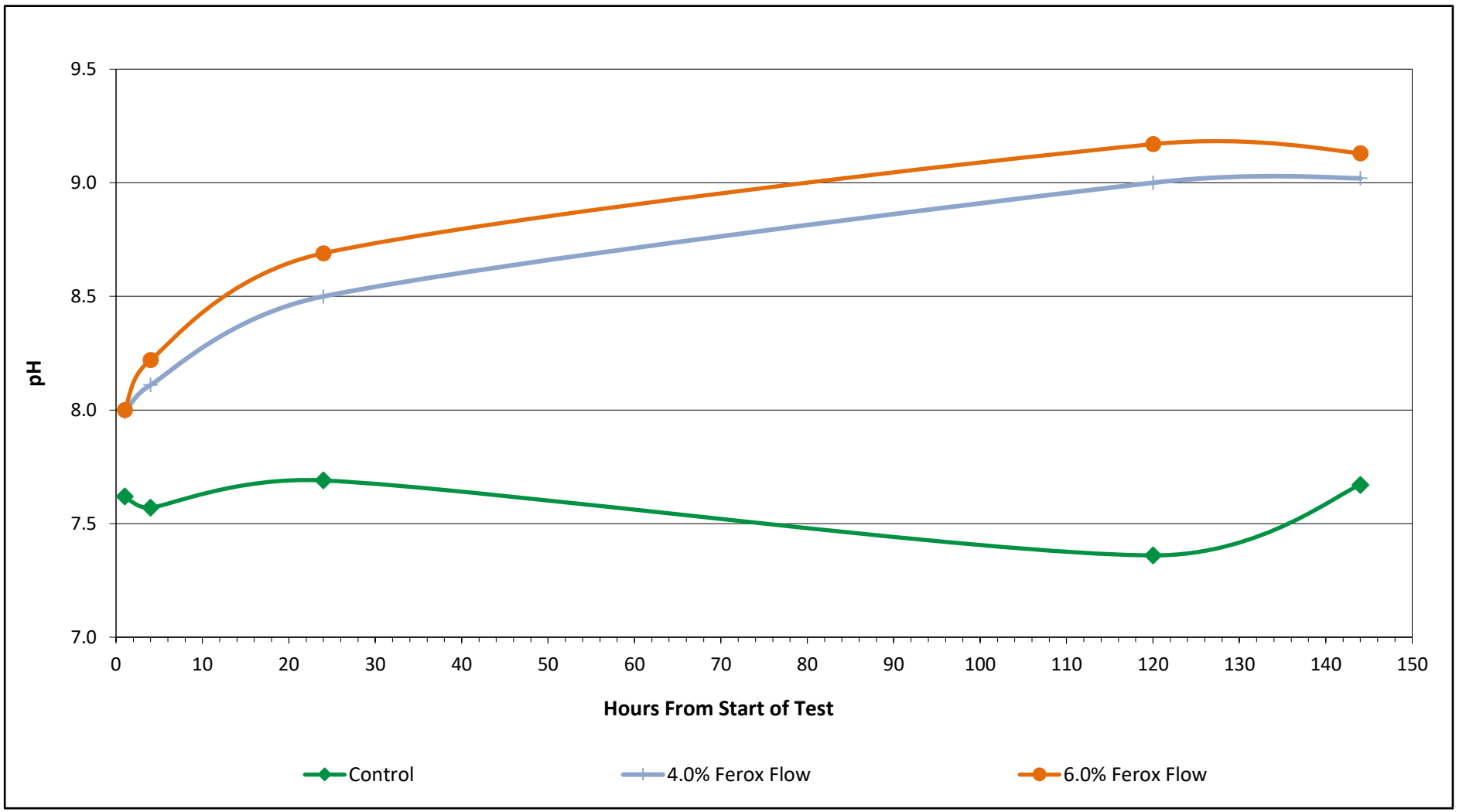
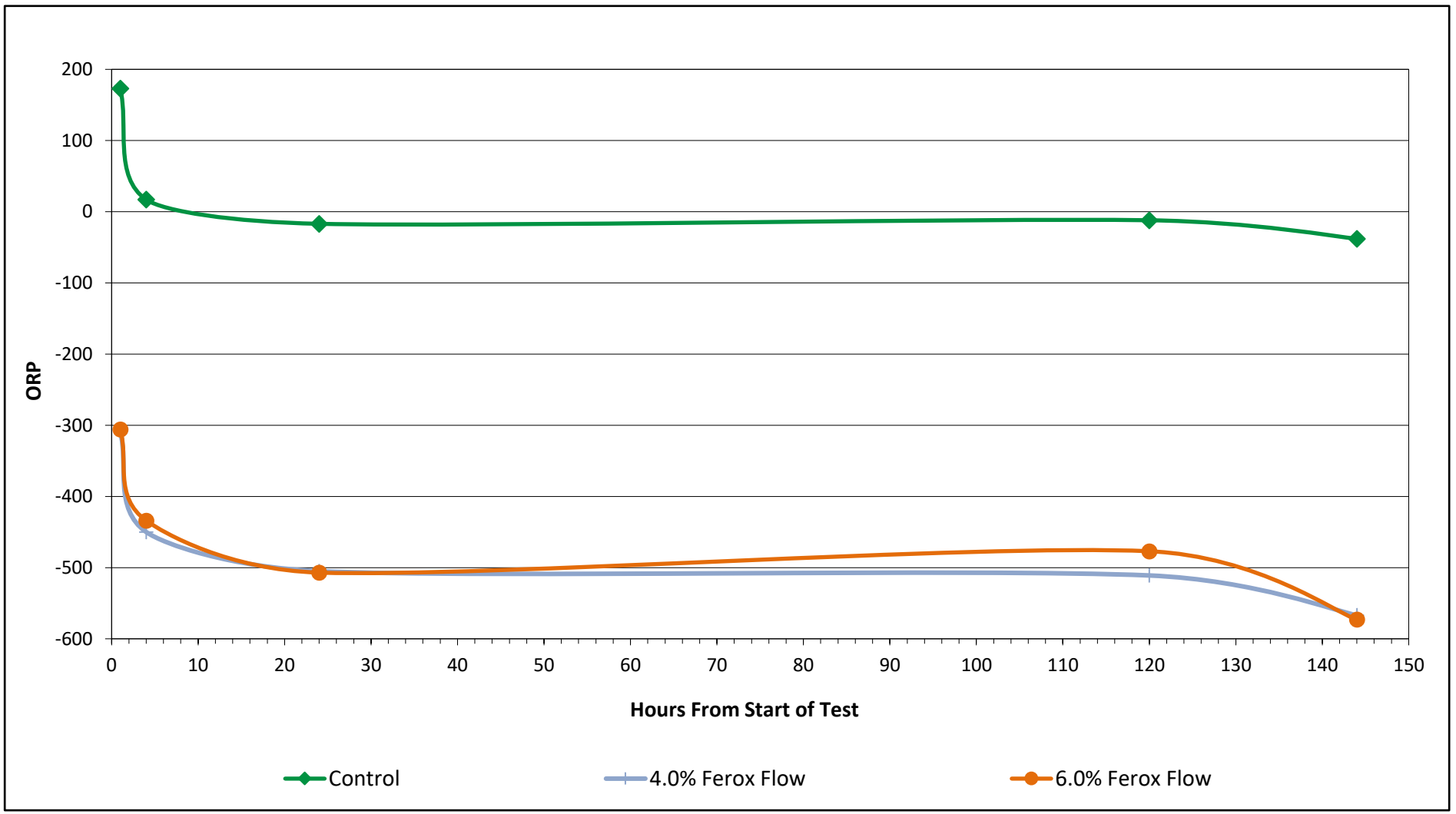


Figure 2
Phase 1 ORP Results
Former Medfield State Hospital Site
Medfield, Massachusetts



TABLES

Table 1
Phase 2 Analytical Results: Soil
Former Medfield State Hospital Site
Medfield, Massachusetts

Analyte	Control	Control Dup	Average	4% ZVI Flow	4% ZVI Flow Dupe	Average	Percent Reduction[1,2]	6% ZVI Flow	6% ZVI Flow Dupe	Average	Percent Reduction[1,2]
VOCs	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(%)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(%)
cis-1,2-DCE	0.074 U	0.072 U	0.073 U	0.076 U	0.069 U	0.073 U	N/A	0.063 U	0.074 U	0.069 U	N/A
TCE	0.074 U	0.072 U	0.073 U	0.076 U	0.069 U	0.073 U	N/A	0.063 U	0.074 U	0.069 U	N/A
PCE	4.9	4.1	4.5	0.076 U	0.069 U	0.073 U	> 99	0.063 U	0.074 U	0.069 U	> 99
Total VOCs	**4.9**	**4.1**	**4.5**	0.076 U	0.076 U	0.076 U	> 99	0.063 U	0.063 U	0.063 U	> 99

Notes:
ZVI = Zero Valent Iron (Hepure Remdiation Products)
VOCs = volatile organic compounds
mg/kg = milligrams per kilogram
U = not detected at the indicated method reporting limit
N/A = not applicable; control not detected and treated test reactor either not detected or detected at a concentration below the control reporting limit.

cis-1,2-DCE = cis-1,2-dichloroethene
TCE = trichloroethene
PCE = tetrachloroethene

1. Percent reductions calculated by comparison with the control.
2. For the purposes of this evaluation, half the sample reporting limit was used to calculate percent reduction for values that were not detected above the sample reporting limit.
3. Control reactors did not contain ZVI.
4. Only contaminants of concern (COCs) are shown.

Table 2
Phase 2 Analytical Results: Groundwater
Former Medfield State Hospital Site
Medfield, Massachusetts

Analyte	Control	4% ZVI Flow	Percent Reduction[1,2]	6% ZVI Flow	Percent Reduction[1,2]
VOCs	(µg/L)	(µg/L)	(%)	(µg/L)	(%)
cis-1,2-DCE	8	2 U	> 88	2 U	> 88
TCE	5	2 U	> 81	2 U	> 81
PCE	12,740	52 J [3]	99.6	22 J [3]	99.8
Total VOCs	**12,754**	**52**	99.6	**22**	99.8

Notes:
ZVI = Zero Valent Iron (Hepure Remdiation Products)
VOCs = volatile organic compounds
µg/L = micrograms per liter
U = not detected at the indicated method reporting limit
N/A = not applicable; control not detected and treated test reactor either not detected or detected at a concentration below the control reporting limit.
cis-1,2-DCE = cis-1,2-dichloroethene
TCE = trichloroethene
PCE = tetrachloroethene

1. Percent reductions calculated by comparison with the control.
2. For the purposes of this evaluation, half the sample reporting limit was used to calculate percent reduction for values that were not detected above the sample reporting limit.
3. J = Laboratory flagged result and indicated that these PCE detections may be a result of carryover from the previous analysis in the sequence (i.e., specifically the untreated control sample exhibiting 12,740 ug/L PCE was run immediately prior to these J-qualified results from the ZVI treated reactors). At the time of this analysis, the laboratory did not have any sample volume remaining with which to rerun the analysis, and therefore was not able to confirm if this was laboratory carryover. Therefore, XDD submitted an additional set of water samples that were left over from the bench test. The results from the second analysis overall exhibited lower concentrations of PCE as expected. This was likely due to the additional ZVI reaction in the reactors due to the longer residence time, as well as some volatile losses (i.e., these reactors had been previously opened to extract the original set of water samples). In the second set of samples, the control exhibited 2,700 µg/L PCE and the 4% and 6% ZVI test conditions were reported as 5 µg/L and 3 µg/L PCE, respectively (refer to Laboratory Reports, attached). This result confirmed that the original J-qualified PCE values of 52J and 22J for the 4% and 6% ZVI tests were likely representative of the actual PCE concentrations remaining at the end of the bench test.

4. Control reactors did not contain ZVI.
5. Only contaminants of concern (COCs) are shown.

Table 3
Phase 2 Analytical Results: Total Mass Degraded in Soil and Groundwater
Former Medfield State Hospital Site
Medfield, Massachusetts

Test Condition	Total VOCs		Total VOC Mass			Total VOC Mass Degraded			
	Water (µg/L)	Soil (mg/kg)	Water (µg)	Soil (µg)	Water + Soil (µg)	Water (µg)	Soil (µg)	Water + Soil (µg)	% Reduction
Control	12,754	4.5	1,101	1,530	2,631	--	--	--	--
4% ZVI Flow	52 J [(1)]	0.076 U	4	13	17	1,096	1,517	2,613	99.3%
6% ZVI Flow	22 J [(1)]	0.063 U	2	11	13	1,099	1,519	2,618	99.5%

Notes:
ZVI = Zero Valent Iron (Hepure Remdiation Products)
VOCs = volatile organic compounds
µg/L = micrograms per liter
mg/kg = milligrams per kilogram
U = not detected at the indicated method reporting limit
-- = not applicable

1. J = Laboratory flagged result and indicated that these PCE detections may be a result of carryover from the previous analysis in the sequence (i.e., specifically the untreated control sample exhibiting 12,740 ug/L PCE was run immediately prior to these J-qualified results from the ZVI treated reactors). At the time of this analysis, the laboratory did not have any sample volume remaining with which to rerun the analysis, and therefore was not able to confirm if this was laboratory carryover. Therefore, XDD submitted an additional set of water samples that were left over from the bench test. The results from the second analysis overall exhibited lower concentrations of PCE as expected. This was likely due to the additional ZVI reaction in the reactors due to the longer residence time, as well as some volatile losses (i.e., these reactors had been previously opened to extract the original set of water samples). In the second set of samples, the control exhibited 2,700 µg/L PCE and the 4% and 6% ZVI test conditions were reported as 5 µg/L and 3 µg/L PCE, respectively (refer to Laboratory Reports, attached). This result confirmed that the original J-qualified PCE values of 52J and 22J for the 4% and 6% ZVI tests were likely representative of the actual PCE concentrations remaining at the end of the bench test.

2. Control reactors did not contain ZVI.
3. For the purposes of this evaluation, half the sample reporting limit was used to calculate percent reduction for values that were not detected above the sample reporting limit.

ATTACHMENT A
Laboratory Reports

Laboratory Report

Absolute Resource associates
124 Heritage Avenue Portsmouth NH 03801

Laurel Crawford
Xpert Design & Diagnostics, LLC
22 Marin Way
Unit 3
Stratham, NH 03885

PO Number: 4596
Job ID: 53293
Date Received: 6/9/20

Project: Medfield 19039

Attached please find results for the analysis of the samples received on the date referenced above.

Unless otherwise noted in the attached report, the analyses performed met the requirements of Absolute Resource Associates' Quality Assurance Plan. The Standard Operating Procedures are based upon USEPA SW-846, USEPA Methods for Chemical Analysis of Water and Wastewater, Standard Methods for the Examination of Water and Wastewater and other recognized methodologies. The results contained in this report pertain only to the samples as indicated on the chain of custody.

Absolute Resource Associates maintains certification with the agencies listed below. The reported results apply to the sample(s) in the condition as received at the time the laboratory took custody. This report shall not be reproduced except in full and with approval from the laboratory. The liability of ARA is limited to the cost of the requested analyses, unless otherwise agreed upon in writing.

We appreciate the opportunity to provide laboratory services. If you have any questions regarding the enclosed report, please contact the laboratory and we will be glad to assist you.

Sincerely,
Absolute Resource Associates

Aaron DeWees
Chief Operating Officer

Date of Approval: 6/16/2020
Total number of pages: 24

Absolute Resource Associates Certifications

New Hampshire	1732	Massachusetts	M-NH902
Maine	NH902		

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-001
Sample ID: Cont
Matrix: Solid Percent Dry: 85.3% Results expressed on a dry weight basis.
Sampled: 6/8/20 12:30

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
chloromethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
vinyl chloride	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
bromomethane	< 0.18	0.18	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
chloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
trichlorofluoromethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
diethyl ether	< 0.37	0.37	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
acetone	< 1.8	1.8	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,1-dichloroethene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
methylene chloride	< 0.18	0.18	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
carbon disulfide	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
trans-1,2-dichloroethene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,1-dichloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
2-butanone (MEK)	< 0.22	0.22	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
2,2-dichloropropane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
cis-1,2-dichloroethene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
chloroform	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
bromochloromethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
tetrahydrofuran (THF)	< 0.37	0.37	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,1,1-trichloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,1-dichloropropene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
carbon tetrachloride	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,2-dichloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
benzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
trichloroethene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,2-dichloropropane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
bromodichloromethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
dibromomethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.33	0.33	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
cis-1,3-dichloropropene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
toluene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
trans-1,3-dichloropropene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
2-hexanone	< 0.37	0.37	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,1,2-trichloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,3-dichloropropane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
tetrachloroethene	**4.9**	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
dibromochloromethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,2-dibromoethane (EDB)	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
chlorobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
ethylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
m&p-xylenes	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-001
Sample ID: Cont
Matrix: Solid Percent Dry: 85.3% Results expressed on a dry weight basis.
Sampled: 6/8/20 12:30

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
styrene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
bromoform	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
isopropylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,2,3-trichloropropane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
n-propylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
bromobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,3,5-trimethylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
2-chlorotoluene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
4-chlorotoluene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
tert-butylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,2,4-trimethylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
sec-butylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,3-dichlorobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
4-isopropyltoluene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,4-dichlorobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,2-dichlorobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
n-butylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,2,4-trichlorobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
hexachlorobutadiene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
naphthalene	< 0.18	0.18	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
1,2,3-trichlorobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**101**	78-114	%	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
toluene-D8 SUR	**108**	88-110	%	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
4-bromofluorobenzene SUR	**105**	86-115	%	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D
a,a,a-trifluorotoluene SUR	**93**	70-130	%	1	LMM	6/10/20	12842	6/12/20	8:13	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-002
Sample ID: Cont Dup
Matrix: Solid Percent Dry: 86.8% Results expressed on a dry weight basis.
Sampled: 6/8/20 12:35

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
chloromethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
vinyl chloride	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
bromomethane	< 0.18	0.18	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
chloroethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
trichlorofluoromethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
diethyl ether	< 0.36	0.36	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
acetone	< 1.8	1.8	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,1-dichloroethene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
methylene chloride	< 0.18	0.18	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
carbon disulfide	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
trans-1,2-dichloroethene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,1-dichloroethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
2-butanone (MEK)	< 0.22	0.22	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
2,2-dichloropropane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
cis-1,2-dichloroethene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
chloroform	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
bromochloromethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
tetrahydrofuran (THF)	< 0.36	0.36	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,1,1-trichloroethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,1-dichloropropene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
carbon tetrachloride	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,2-dichloroethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
benzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
trichloroethene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,2-dichloropropane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
bromodichloromethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
dibromomethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.33	0.33	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
cis-1,3-dichloropropene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
toluene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
trans-1,3-dichloropropene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
2-hexanone	< 0.36	0.36	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,1,2-trichloroethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,3-dichloropropane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
tetrachloroethene	**4.1**	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
dibromochloromethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,2-dibromoethane (EDB)	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
chlorobenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
ethylbenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
m&p-xylenes	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-002
Sample ID: Cont Dup
Matrix: Solid Percent Dry: 86.8% Results expressed on a dry weight basis.
Sampled: 6/8/20 12:35

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
styrene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
bromoform	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
isopropylbenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,2,3-trichloropropane	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
n-propylbenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
bromobenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,3,5-trimethylbenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
2-chlorotoluene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
4-chlorotoluene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
tert-butylbenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,2,4-trimethylbenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
sec-butylbenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,3-dichlorobenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
4-isopropyltoluene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,4-dichlorobenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,2-dichlorobenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
n-butylbenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,2,4-trichlorobenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
hexachlorobutadiene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
naphthalene	< 0.18	0.18	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
1,2,3-trichlorobenzene	< 0.072	0.072	ug/g	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**102**	78-114	%	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
toluene-D8 SUR	**104**	88-110	%	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
4-bromofluorobenzene SUR	**102**	86-115	%	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D
a,a,a-trifluorotoluene SUR	**100**	70-130	%	1	LMM	6/10/20	12842	6/12/20	8:39	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-003
Sample ID: Flow New Mid
Matrix: Solid Percent Dry: 87.3% Results expressed on a dry weight basis.
Sampled: 6/8/20 13:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
chloromethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
vinyl chloride	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
bromomethane	< 0.19	0.19	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
chloroethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
trichlorofluoromethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
diethyl ether	< 0.38	0.38	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
acetone	< 1.9	1.9	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,1-dichloroethene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
methylene chloride	< 0.19	0.19	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
carbon disulfide	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
trans-1,2-dichloroethene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,1-dichloroethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
2-butanone (MEK)	< 0.23	0.23	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
2,2-dichloropropane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
cis-1,2-dichloroethene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
chloroform	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
bromochloromethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
tetrahydrofuran (THF)	< 0.38	0.38	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,1,1-trichloroethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,1-dichloropropene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
carbon tetrachloride	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,2-dichloroethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
benzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
trichloroethene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,2-dichloropropane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
bromodichloromethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
dibromomethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.34	0.34	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
cis-1,3-dichloropropene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
toluene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
trans-1,3-dichloropropene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
2-hexanone	< 0.38	0.38	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,1,2-trichloroethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,3-dichloropropane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
tetrachloroethene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
dibromochloromethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,2-dibromoethane (EDB)	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
chlorobenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
ethylbenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
m&p-xylenes	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-003
Sample ID: Flow New Mid
Matrix: Solid Percent Dry: 87.3% Results expressed on a dry weight basis.
Sampled: 6/8/20 13:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
styrene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
bromoform	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
isopropylbenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,2,3-trichloropropane	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
n-propylbenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
bromobenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,3,5-trimethylbenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
2-chlorotoluene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
4-chlorotoluene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
tert-butylbenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,2,4-trimethylbenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
sec-butylbenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,3-dichlorobenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
4-isopropyltoluene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,4-dichlorobenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,2-dichlorobenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
n-butylbenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,2,4-trichlorobenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
hexachlorobutadiene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
naphthalene	< 0.19	0.19	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
1,2,3-trichlorobenzene	< 0.076	0.076	ug/g	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**95**	78-114	%	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
toluene-D8 SUR	**109**	88-110	%	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
4-bromofluorobenzene SUR	**96**	86-115	%	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D
a,a,a-trifluorotoluene SUR	**93**	70-130	%	1	LMM	6/10/20	12842	6/12/20	9:06	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-004
Sample ID: Flow New Mid Dup
Matrix: Solid Percent Dry: 87.7% Results expressed on a dry weight basis.
Sampled: 6/8/20 13:05

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
chloromethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
vinyl chloride	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
bromomethane	< 0.17	0.17	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
chloroethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
trichlorofluoromethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
diethyl ether	< 0.35	0.35	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
acetone	< 1.7	1.7	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,1-dichloroethene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
methylene chloride	< 0.17	0.17	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
carbon disulfide	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
trans-1,2-dichloroethene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,1-dichloroethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
2-butanone (MEK)	< 0.21	0.21	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
2,2-dichloropropane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
cis-1,2-dichloroethene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
chloroform	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
bromochloromethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
tetrahydrofuran (THF)	< 0.35	0.35	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,1,1-trichloroethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,1-dichloropropene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
carbon tetrachloride	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,2-dichloroethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
benzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
trichloroethene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,2-dichloropropane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
bromodichloromethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
dibromomethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.31	0.31	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
cis-1,3-dichloropropene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
toluene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
trans-1,3-dichloropropene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
2-hexanone	< 0.35	0.35	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,1,2-trichloroethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,3-dichloropropane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
tetrachloroethene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
dibromochloromethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,2-dibromoethane (EDB)	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
chlorobenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
ethylbenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
m&p-xylenes	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-004
Sample ID: Flow New Mid Dup
Matrix: Solid Percent Dry: 87.7% Results expressed on a dry weight basis.
Sampled: 6/8/20 13:05

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
styrene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
bromoform	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
isopropylbenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,2,3-trichloropropane	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
n-propylbenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
bromobenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,3,5-trimethylbenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
2-chlorotoluene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
4-chlorotoluene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
tert-butylbenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,2,4-trimethylbenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
sec-butylbenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,3-dichlorobenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
4-isopropyltoluene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,4-dichlorobenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,2-dichlorobenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
n-butylbenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,2,4-trichlorobenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
hexachlorobutadiene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
naphthalene	< 0.17	0.17	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
1,2,3-trichlorobenzene	< 0.069	0.069	ug/g	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**98**	78-114	%	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
toluene-D8 SUR	**102**	88-110	%	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
4-bromofluorobenzene SUR	**105**	86-115	%	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D
a,a,a-trifluorotoluene SUR	**94**	70-130	%	1	LMM	6/10/20	12842	6/12/20	9:32	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-005
Sample ID: Flow New High
Matrix: Solid Percent Dry: 87.2% Results expressed on a dry weight basis.
Sampled: 6/8/20 13:10

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
chloromethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
vinyl chloride	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
bromomethane	< 0.16	0.16	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
chloroethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
trichlorofluoromethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
diethyl ether	< 0.32	0.32	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
acetone	< 1.6	1.6	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,1-dichloroethene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
methylene chloride	< 0.16	0.16	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
carbon disulfide	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
trans-1,2-dichloroethene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,1-dichloroethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
2-butanone (MEK)	< 0.19	0.19	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
2,2-dichloropropane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
cis-1,2-dichloroethene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
chloroform	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
bromochloromethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
tetrahydrofuran (THF)	< 0.32	0.32	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,1,1-trichloroethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,1-dichloropropene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
carbon tetrachloride	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,2-dichloroethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
benzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
trichloroethene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,2-dichloropropane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
bromodichloromethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
dibromomethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.28	0.28	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
cis-1,3-dichloropropene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
toluene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
trans-1,3-dichloropropene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
2-hexanone	< 0.32	0.32	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,1,2-trichloroethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,3-dichloropropane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
tetrachloroethene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
dibromochloromethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,2-dibromoethane (EDB)	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
chlorobenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
ethylbenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
m&p-xylenes	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-005
Sample ID: Flow New High
Matrix: Solid Percent Dry: 87.2% Results expressed on a dry weight basis.
Sampled: 6/8/20 13:10

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
styrene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
bromoform	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
isopropylbenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,2,3-trichloropropane	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
n-propylbenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
bromobenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,3,5-trimethylbenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
2-chlorotoluene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
4-chlorotoluene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
tert-butylbenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,2,4-trimethylbenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
sec-butylbenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,3-dichlorobenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
4-isopropyltoluene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,4-dichlorobenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,2-dichlorobenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
n-butylbenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,2,4-trichlorobenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
hexachlorobutadiene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
naphthalene	< 0.16	0.16	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
1,2,3-trichlorobenzene	< 0.063	0.063	ug/g	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**93**	78-114	%	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
toluene-D8 SUR	**103**	88-110	%	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
4-bromofluorobenzene SUR	**95**	86-115	%	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D
a,a,a-trifluorotoluene SUR	**99**	70-130	%	1	LMM	6/10/20	12842	6/12/20	9:59	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-006
Sample ID: Flow New High Dup
Matrix: Solid Percent Dry: 87.6% Results expressed on a dry weight basis.
Sampled: 6/8/20 13:15

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
chloromethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
vinyl chloride	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
bromomethane	< 0.18	0.18	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
chloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
trichlorofluoromethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
diethyl ether	< 0.37	0.37	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
acetone	< 1.8	1.8	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,1-dichloroethene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
methylene chloride	< 0.18	0.18	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
carbon disulfide	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
trans-1,2-dichloroethene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,1-dichloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
2-butanone (MEK)	< 0.22	0.22	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
2,2-dichloropropane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
cis-1,2-dichloroethene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
chloroform	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
bromochloromethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
tetrahydrofuran (THF)	< 0.37	0.37	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,1,1-trichloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,1-dichloropropene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
carbon tetrachloride	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,2-dichloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
benzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
trichloroethene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,2-dichloropropane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
bromodichloromethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
dibromomethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.33	0.33	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
cis-1,3-dichloropropene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
toluene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
trans-1,3-dichloropropene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
2-hexanone	< 0.37	0.37	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,1,2-trichloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,3-dichloropropane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
tetrachloroethene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
dibromochloromethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,2-dibromoethane (EDB)	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
chlorobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
ethylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
m&p-xylenes	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-006
Sample ID: Flow New High Dup
Matrix: Solid Percent Dry: 87.6% Results expressed on a dry weight basis.
Sampled: 6/8/20 13:15

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
styrene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
bromoform	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
isopropylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,2,3-trichloropropane	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
n-propylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
bromobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,3,5-trimethylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
2-chlorotoluene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
4-chlorotoluene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
tert-butylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,2,4-trimethylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
sec-butylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,3-dichlorobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
4-isopropyltoluene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,4-dichlorobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,2-dichlorobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
n-butylbenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,2,4-trichlorobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
hexachlorobutadiene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
naphthalene	< 0.18	0.18	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
1,2,3-trichlorobenzene	< 0.074	0.074	ug/g	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**96**	78-114	%	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
toluene-D8 SUR	**103**	88-110	%	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
4-bromofluorobenzene SUR	**103**	86-115	%	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D
a,a,a-trifluorotoluene SUR	**93**	70-130	%	1	LMM	6/10/20	12842	6/12/20	10:26	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-007
Sample ID: Cont
Matrix: Water
Sampled: 6/8/20 12:30

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
chloromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
vinyl chloride	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
bromomethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
chloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
trichlorofluoromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
diethyl ether	< 5	5	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
acetone	< 50	50	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,1-dichloroethene	< 1	1	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
methylene chloride	< 5	5	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
carbon disulfide	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
methyl t-butyl ether (MTBE)	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
trans-1,2-dichloroethene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,1-dichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
2-butanone (MEK)	< 10	10	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
2,2-dichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
cis-1,2-dichloroethene	**8**	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
chloroform	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
bromochloromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
tetrahydrofuran (THF)	< 10	10	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,1,1-trichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,1-dichloropropene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
carbon tetrachloride	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,2-dichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
benzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
trichloroethene	**5**	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,2-dichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
bromodichloromethane	< 1	1	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
dibromomethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
4-methyl-2-pentanone (MIBK)	< 10	10	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
cis-1,3-dichloropropene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
toluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
trans-1,3-dichloropropene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
2-hexanone	< 10	10	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,1,2-trichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,3-dichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
tetrachloroethene	**12740**E	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
dibromochloromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,2-dibromoethane (EDB)	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
chlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,1,1,2-tetrachloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
ethylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
m&p-xylenes	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-007
Sample ID: Cont
Matrix: Water
Sampled: 6/8/20 12:30

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
styrene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
bromoform	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
isopropylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,1,2,2-tetrachloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,2,3-trichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
n-propylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
bromobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,3,5-trimethylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
2-chlorotoluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
4-chlorotoluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
tert-butylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,2,4-trimethylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
sec-butylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,3-dichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
4-isopropyltoluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,4-dichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,2-dichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
n-butylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,2-dibromo-3-chloropropane (DBCP)	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,2,4-trichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
hexachlorobutadiene	< 0.5	0.5	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
naphthalene	< 5	5	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
1,2,3-trichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**98**	78-114	%	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
toluene-D8 SUR	**102**	88-110	%	1	LMM		2002590	6/12/20	20:56	SW5030C8260D
4-bromofluorobenzene SUR	**82***	86-115	%	1	LMM		2002590	6/12/20	20:56	SW5030C8260D

**** The surrogate showed recovery outside the acceptance limits. Matrix interference suspected.***
E = The analytical result was above the instrument calibration range. The reported concentration is an estimate. No additional sample remains for reanalysis.

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-008
Sample ID: Flow New Mid
Matrix: Water
Sampled: 6/8/20 13:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
chloromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
vinyl chloride	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
bromomethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
chloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
trichlorofluoromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
diethyl ether	< 5	5	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
acetone	**55**#	50	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,1-dichloroethene	< 1	1	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
methylene chloride	< 5	5	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
carbon disulfide	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
methyl t-butyl ether (MTBE)	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
trans-1,2-dichloroethene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,1-dichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
2-butanone (MEK)	**31**	10	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
2,2-dichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
cis-1,2-dichloroethene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
chloroform	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
bromochloromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
tetrahydrofuran (THF)	< 10	10	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,1,1-trichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,1-dichloropropene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
carbon tetrachloride	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,2-dichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
benzene	**11**	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
trichloroethene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,2-dichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
bromodichloromethane	< 1	1	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
dibromomethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
4-methyl-2-pentanone (MIBK)	< 10	10	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
cis-1,3-dichloropropene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
toluene	**11**	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
trans-1,3-dichloropropene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
2-hexanone	< 10	10	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,1,2-trichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,3-dichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
tetrachloroethene	**52**J	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
dibromochloromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,2-dibromoethane (EDB)	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
chlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,1,1,2-tetrachloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
ethylbenzene	**5**	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
m&p-xylenes	**3**	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-008
Sample ID: Flow New Mid
Matrix: Water
Sampled: 6/8/20 13:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
styrene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
bromoform	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
isopropylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,1,2,2-tetrachloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,2,3-trichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
n-propylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
bromobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,3,5-trimethylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
2-chlorotoluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
4-chlorotoluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
tert-butylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,2,4-trimethylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
sec-butylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,3-dichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
4-isopropyltoluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,4-dichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,2-dichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
n-butylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,2-dibromo-3-chloropropane (DBCP)	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,2,4-trichlorobenzene	**2**	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
hexachlorobutadiene	< 0.5	0.5	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
naphthalene	< 5	5	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
1,2,3-trichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**91**	78-114	%	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
toluene-D8 SUR	**99**	88-110	%	1	LMM		2002590	6/12/20	21:22	SW5030C8260D
4-bromofluorobenzene SUR	**108**	86-115	%	1	LMM		2002590	6/12/20	21:22	SW5030C8260D

= The percent recovery for this compound was above the acceptance criteria in the LCSD. The LCS showed acceptable results. The reported concentration is an estimate.

J = The reported concentration is likely a result of carryover from the previous analysis. No additional sample remains for reanalysis.

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-009
Sample ID: Flow New High
Matrix: Water
Sampled: 6/8/20 13:10

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
chloromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
vinyl chloride	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
bromomethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
chloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
trichlorofluoromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
diethyl ether	< 5	5	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
acetone	**84**#	50	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,1-dichloroethene	< 1	1	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
methylene chloride	< 5	5	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
carbon disulfide	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
methyl t-butyl ether (MTBE)	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
trans-1,2-dichloroethene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,1-dichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
2-butanone (MEK)	**49**	10	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
2,2-dichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
cis-1,2-dichloroethene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
chloroform	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
bromochloromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
tetrahydrofuran (THF)	< 10	10	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,1,1-trichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,1-dichloropropene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
carbon tetrachloride	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,2-dichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
benzene	**12**	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
trichloroethene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,2-dichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
bromodichloromethane	< 1	1	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
dibromomethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
4-methyl-2-pentanone (MIBK)	< 10	10	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
cis-1,3-dichloropropene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
toluene	**11**	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
trans-1,3-dichloropropene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
2-hexanone	< 10	10	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,1,2-trichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,3-dichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
tetrachloroethene	**22**J	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
dibromochloromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,2-dibromoethane (EDB)	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
chlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,1,1,2-tetrachloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
ethylbenzene	**5**	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
m&p-xylenes	**3**	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-009
Sample ID: Flow New High
Matrix: Water
Sampled: 6/8/20 13:10

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
styrene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
bromoform	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
isopropylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,1,2,2-tetrachloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,2,3-trichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
n-propylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
bromobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,3,5-trimethylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
2-chlorotoluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
4-chlorotoluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
tert-butylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,2,4-trimethylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
sec-butylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,3-dichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
4-isopropyltoluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,4-dichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,2-dichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
n-butylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,2-dibromo-3-chloropropane (DBCP)	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,2,4-trichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
hexachlorobutadiene	< 0.5	0.5	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
naphthalene	< 5	5	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
1,2,3-trichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**94**	78-114	%	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
toluene-D8 SUR	**95**	88-110	%	1	LMM		2002590	6/12/20	21:48	SW5030C8260D
4-bromofluorobenzene SUR	**102**	86-115	%	1	LMM		2002590	6/12/20	21:48	SW5030C8260D

= The percent recovery for this compound was above the acceptance criteria in the LCSD. The LCS showed acceptable results. The reported concentration is an estimate.

J = The reported concentration is likely a result of carryover from the previous analysis. No additional sample remains for reanalysis.

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-010
Sample ID: Trip Blank
Matrix: Solid
Sampled: 6/8/20 0:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
chloromethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
vinyl chloride	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
bromomethane	< 0.25	0.25	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
chloroethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
trichlorofluoromethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
diethyl ether	< 0.50	0.50	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
acetone	< 2.5	2.5	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,1-dichloroethene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
methylene chloride	< 0.25	0.25	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
carbon disulfide	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
methyl t-butyl ether (MTBE)	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
trans-1,2-dichloroethene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,1-dichloroethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
2-butanone (MEK)	< 0.30	0.30	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
2,2-dichloropropane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
cis-1,2-dichloroethene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
chloroform	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
bromochloromethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
tetrahydrofuran (THF)	< 0.50	0.50	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,1,1-trichloroethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,1-dichloropropene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
carbon tetrachloride	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,2-dichloroethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
benzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
trichloroethene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,2-dichloropropane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
bromodichloromethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
dibromomethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
4-methyl-2-pentanone (MIBK)	< 0.45	0.45	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
cis-1,3-dichloropropene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
toluene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
trans-1,3-dichloropropene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
2-hexanone	< 0.50	0.50	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,1,2-trichloroethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,3-dichloropropane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
tetrachloroethene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
dibromochloromethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,2-dibromoethane (EDB)	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
chlorobenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,1,1,2-tetrachloroethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
ethylbenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
m&p-xylenes	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-010
Sample ID: Trip Blank
Matrix: Solid
Sampled: 6/8/20 0:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
styrene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
bromoform	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
isopropylbenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,1,2,2-tetrachloroethane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,2,3-trichloropropane	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
n-propylbenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
bromobenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,3,5-trimethylbenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
2-chlorotoluene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
4-chlorotoluene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
tert-butylbenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,2,4-trimethylbenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
sec-butylbenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,3-dichlorobenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
4-isopropyltoluene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,4-dichlorobenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,2-dichlorobenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
n-butylbenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,2-dibromo-3-chloropropane (DBCP)	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,2,4-trichlorobenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
hexachlorobutadiene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
naphthalene	< 0.25	0.25	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
1,2,3-trichlorobenzene	< 0.10	0.10	ug/g	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**96**	78-114	%	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
toluene-D8 SUR	**102**	88-110	%	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
4-bromofluorobenzene SUR	**106**	86-115	%	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D
a,a,a-trifluorotoluene SUR	**93**	70-130	%	1	LMM	6/10/20	12842	6/12/20	4:14	SW5035A8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-011
Sample ID: Trip Blank
Matrix: Water
Sampled: 6/8/20 0:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
chloromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
vinyl chloride	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
bromomethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
chloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
trichlorofluoromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
diethyl ether	< 5	5	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
acetone	< 50	50	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,1-dichloroethene	< 1	1	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
methylene chloride	< 5	5	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
carbon disulfide	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
methyl t-butyl ether (MTBE)	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
trans-1,2-dichloroethene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,1-dichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
2-butanone (MEK)	< 10	10	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
2,2-dichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
cis-1,2-dichloroethene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
chloroform	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
bromochloromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
tetrahydrofuran (THF)	< 10	10	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,1,1-trichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,1-dichloropropene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
carbon tetrachloride	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,2-dichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
benzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
trichloroethene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,2-dichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
bromodichloromethane	< 1	1	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
dibromomethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
4-methyl-2-pentanone (MIBK)	< 10	10	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
cis-1,3-dichloropropene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
toluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
trans-1,3-dichloropropene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
2-hexanone	< 10	10	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,1,2-trichloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,3-dichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
tetrachloroethene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
dibromochloromethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,2-dibromoethane (EDB)	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
chlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,1,1,2-tetrachloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
ethylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
m&p-xylenes	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D

Project ID: Medfield 19039
Job ID: 53293
Sample#: 53293-011
Sample ID: Trip Blank
Matrix: Water
Sampled: 6/8/20 0:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
styrene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
bromoform	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
isopropylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,1,2,2-tetrachloroethane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,2,3-trichloropropane	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
n-propylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
bromobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,3,5-trimethylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
2-chlorotoluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
4-chlorotoluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
tert-butylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,2,4-trimethylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
sec-butylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,3-dichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
4-isopropyltoluene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,4-dichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,2-dichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
n-butylbenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,2-dibromo-3-chloropropane (DBCP)	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,2,4-trichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
hexachlorobutadiene	< 0.5	0.5	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
naphthalene	< 5	5	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
1,2,3-trichlorobenzene	< 2	2	ug/L	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**94**	78-114	%	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
toluene-D8 SUR	**102**	88-110	%	1	LMM		2002590	6/12/20	17:51	SW5030C8260D
4-bromofluorobenzene SUR	**92**	86-115	%	1	LMM		2002590	6/12/20	17:51	SW5030C8260D

Absolute Resource associates
124 Heritage Avenue #16
Portsmouth, NH 03801
603-436-2001
absoluteresourceassociates.com

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

53293
Lab ID Here

Company Name: XDD
Company Address:
Report To:
Phone #:
Invoice to:
Email:
PO #: 4596

Project Name: Medfield
Project #: 19039
Project Location: NH MA ME VT
Accreditation Required? N/Y:
Protocol: RCRA MCP SDWA NHDES NPDES DOD
Reporting Limits: QAPP EPA DW GW-1 S-1 Other
Quote #
❑ NH Reimbursement Pricing

ANALYSIS REQUEST

❑ VOC 8260 ❑ VOC 8260 NHDES ❑ VOC 8260 MADEP
❑ VOC 624.1 ❑ VOC BTEX MtBE, only ❑ VOC 8021VT
❑ VPH MADEP ❑ GRO 8015 ❑ 1,4-Dioxane
❑ VOC 524.2 ❑ VOC 524.2 NH List ❑ Gases-List:
❑ TPH ❑ DRO 8015 ❑ EPH MADEP ❑ TPH Fingerprint
❑ 8270PAH ❑ 8270ABN ❑ 625.1 ❑ EDB
❑ 8082 PCB ❑ 8081 Pesticides ❑ 608.3 Pest/PCB
❑ O&G 1664 ❑ Mineral O&G 1664
❑ pH ❑ BOD ❑ Conductivity ❑ Turbidity ❑ Apparent Color
❑ TSS ❑ TDS ❑ TVS ❑ Alkalinity ❑ Acidity
❑ RCRA Metals ❑ Priority Pollutant Metals ❑ TAL Metals ❑ Hardness
❑ Total Metals-list:
❑ Dissolved Metals-list:
❑ Ammonia ❑ COD ❑ TKN ❑ TN ❑ TON ❑ TOC ❑ Ferrous Iron
❑ T-Phosphorus ❑ Bacteria P/A ❑ Bacteria MPN ❑ Enterococci
❑ Cyanide ❑ Sulfide ❑ Nitrate + Nitrite ❑ Ortho P ❑ Phenols
❑ Nitrate ❑ Nitrite ❑ Chloride ❑ Sulfate ❑ Bromide ❑ Fluoride
❑ Corrosivity ❑ Reactive CN ❑ Reactive S- ❑ Ignitibility/FP
❑ TCLP Metals ❑ TCLP VOC ❑ TCLP SVOC ❑ TCLP Pesticide
Subcontract: ❑ Grain Size ❑ Herbicides ❑ Asbestos ❑ PFAS
Grab (G) or Composite (C)

Lab Sample ID (Lab Use Only)	Field ID	# CONTAINERS	Matrix: WATER	SOLID	OTHER	Preservation Method: HCl	HNO_3	H_2SO_4	NaOH	MeOH	Sampling: DATE	TIME	SAMPLER
07 53293-01	Cont		X	X		X				X	6/8/20	1230	LC
-02	Cont Dup			X						X		1235	
08 -03	Flow New Mid		X	X		X				X		1300	
-04	Flow New Mid Dup			X						X		1305	
09 -05	Flow New High		X	X		X				X		1310	
-06	Flow New High Dup			X						X	↓	1315	↓
10 -11	Trip Blank		X			X				X			

TAT REQUESTED
Priority (24 hr)* ❑
Expedited (48 hr)* ❑
Standard ❑ (10 Business Days)
*Date Needed 6/16/20

See absoluteresourceassociates.com for sample acceptance policy and current accreditation lists.

SPECIAL INSTRUCTIONS

REPORTING INSTRUCTIONS ☒ PDF (e-mail address) LCrawford@xdd-llc.com
❑ HARD COPY REQUIRED ❑ EDD

RECEIVED ON ICE ☒ YES ❑ NO
TEMPERATURE 4 °C

CUSTODY RECORD
QSD-01 Revision 03/09/2020

	Date	Time		Date	Time
Relinquished by Sampler:	6/9/20	10:27	Received by:	6/9/20	1027
Relinquished by:			Received by:		
Relinquished by:	6/9/20	1101	Received by Laboratory:	6/9/20	1101

Laboratory Report

Absolute Resource associates
124 Heritage Avenue Portsmouth NH 03801

Laurel Crawford
Xpert Design & Diagnostics, LLC
22 Marin Way
Unit 3
Stratham, NH 03885

PO Number: None
Job ID: 53494
Date Received: 6/22/20

Project: Medfield 19039

Attached please find results for the analysis of the samples received on the date referenced above.

Unless otherwise noted in the attached report, the analyses performed met the requirements of Absolute Resource Associates' Quality Assurance Plan. The Standard Operating Procedures are based upon USEPA SW-846, USEPA Methods for Chemical Analysis of Water and Wastewater, Standard Methods for the Examination of Water and Wastewater and other recognized methodologies. The results contained in this report pertain only to the samples as indicated on the chain of custody.

Absolute Resource Associates maintains certification with the agencies listed below. The reported results apply to the sample(s) in the condition as received at the time the laboratory took custody. This report shall not be reproduced except in full and with approval from the laboratory. The liability of ARA is limited to the cost of the requested analyses, unless otherwise agreed upon in writing.

We appreciate the opportunity to provide laboratory services. If you have any questions regarding the enclosed report, please contact the laboratory and we will be glad to assist you.

Sincerely,
Absolute Resource Associates

Aaron DeWees
Chief Operating Officer

Date of Approval: 6/26/2020
Total number of pages: 8

Absolute Resource Associates Certifications

New Hampshire	1732	Massachusetts	M-NH902
Maine	NH902		

Project ID: Medfield 19039
Job ID: 53494
Sample#: 53494-001
Sample ID: Cont
Matrix: Water
Sampled: 6/22/20 8:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
chloromethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
vinyl chloride	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
bromomethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
chloroethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
trichlorofluoromethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
diethyl ether	< 250	250	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
acetone	< 2500	2500	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,1-dichloroethene	< 50	50	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
methylene chloride	< 250	250	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
carbon disulfide	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
methyl t-butyl ether (MTBE)	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
trans-1,2-dichloroethene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,1-dichloroethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
2-butanone (MEK)	< 500	500	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
2,2-dichloropropane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
cis-1,2-dichloroethene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
chloroform	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
bromochloromethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
tetrahydrofuran (THF)	< 500	500	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,1,1-trichloroethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,1-dichloropropene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
carbon tetrachloride	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,2-dichloroethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
benzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
trichloroethene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,2-dichloropropane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
bromodichloromethane	< 30	30	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
dibromomethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
4-methyl-2-pentanone (MIBK)	< 500	500	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
cis-1,3-dichloropropene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
toluene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
trans-1,3-dichloropropene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
2-hexanone	< 500	500	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,1,2-trichloroethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,3-dichloropropane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
tetrachloroethene	**2700**	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
dibromochloromethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,2-dibromoethane (EDB)	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
chlorobenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,1,1,2-tetrachloroethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
ethylbenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
m&p-xylenes	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D

Absolute Resource associates

Project ID: Medfield 19039
Job ID: 53494
Sample#: 53494-001
Sample ID: Cont
Matrix: Water
Sampled: 6/22/20 8:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
styrene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
bromoform	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
isopropylbenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,1,2,2-tetrachloroethane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,2,3-trichloropropane	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
n-propylbenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
bromobenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,3,5-trimethylbenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
2-chlorotoluene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
4-chlorotoluene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
tert-butylbenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,2,4-trimethylbenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
sec-butylbenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,3-dichlorobenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
4-isopropyltoluene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,4-dichlorobenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,2-dichlorobenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
n-butylbenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,2-dibromo-3-chloropropane (DBCP)	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,2,4-trichlorobenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
hexachlorobutadiene	< 25	25	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
naphthalene	< 250	250	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
1,2,3-trichlorobenzene	< 100	100	ug/L	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**98**	78-114	%	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
toluene-D8 SUR	**101**	88-110	%	50	LMM		2002717	6/24/20	8:36	SW5030C8260D
4-bromofluorobenzene SUR	**97**	86-115	%	50	LMM		2002717	6/24/20	8:36	SW5030C8260D

Project ID: Medfield 19039
Job ID: 53494
Sample#: 53494-002
Sample ID: Flow New Mid
Matrix: Water
Sampled: 6/22/20 8:15

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
chloromethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
vinyl chloride	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
bromomethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
chloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
trichlorofluoromethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
diethyl ether	< 5	5	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
acetone	**59**	50	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,1-dichloroethene	< 1	1	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
methylene chloride	< 5	5	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
carbon disulfide	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
methyl t-butyl ether (MTBE)	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
trans-1,2-dichloroethene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,1-dichloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
2-butanone (MEK)	**24**	10	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
2,2-dichloropropane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
cis-1,2-dichloroethene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
chloroform	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
bromochloromethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
tetrahydrofuran (THF)	< 10	10	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,1,1-trichloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,1-dichloropropene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
carbon tetrachloride	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,2-dichloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
benzene	**2**	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
trichloroethene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,2-dichloropropane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
bromodichloromethane	< 1	1	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
dibromomethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
4-methyl-2-pentanone (MIBK)	< 10	10	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
cis-1,3-dichloropropene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
toluene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
trans-1,3-dichloropropene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
2-hexanone	< 10	10	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,1,2-trichloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,3-dichloropropane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
tetrachloroethene	**5**	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
dibromochloromethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,2-dibromoethane (EDB)	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
chlorobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,1,1,2-tetrachloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
ethylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
m&p-xylenes	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D

Absolute Resource associates

Project ID: Medfield 19039
Job ID: 53494
Sample#: 53494-002
Sample ID: Flow New Mid
Matrix: Water
Sampled: 6/22/20 8:15

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
styrene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
bromoform	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
isopropylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,1,2,2-tetrachloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,2,3-trichloropropane	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
n-propylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
bromobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,3,5-trimethylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
2-chlorotoluene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
4-chlorotoluene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
tert-butylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,2,4-trimethylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
sec-butylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,3-dichlorobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
4-isopropyltoluene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,4-dichlorobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,2-dichlorobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
n-butylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,2-dibromo-3-chloropropane (DBCP)	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,2,4-trichlorobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
hexachlorobutadiene	< 0.5	0.5	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
naphthalene	< 5	5	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
1,2,3-trichlorobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**100**	78-114	%	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
toluene-D8 SUR	**101**	88-110	%	1	LMM		2002717	6/24/20	7:35	SW5030C8260D
4-bromofluorobenzene SUR	**97**	86-115	%	1	LMM		2002717	6/24/20	7:35	SW5030C8260D

Project ID: Medfield 19039
Job ID: 53494
Sample#: 53494-003
Sample ID: Flow New High
Matrix: Water
Sampled: 6/22/20 8:20

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
dichlorodifluoromethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
chloromethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
vinyl chloride	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
bromomethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
chloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
trichlorofluoromethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
diethyl ether	< 5	5	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
acetone	**69**	50	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,1-dichloroethene	< 1	1	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
methylene chloride	< 5	5	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
carbon disulfide	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
methyl t-butyl ether (MTBE)	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
trans-1,2-dichloroethene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,1-dichloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
2-butanone (MEK)	**30**	10	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
2,2-dichloropropane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
cis-1,2-dichloroethene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
chloroform	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
bromochloromethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
tetrahydrofuran (THF)	< 10	10	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,1,1-trichloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,1-dichloropropene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
carbon tetrachloride	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,2-dichloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
benzene	**3**	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
trichloroethene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,2-dichloropropane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
bromodichloromethane	< 1	1	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
dibromomethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
4-methyl-2-pentanone (MIBK)	< 10	10	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
cis-1,3-dichloropropene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
toluene	**3**	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
trans-1,3-dichloropropene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
2-hexanone	< 10	10	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,1,2-trichloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,3-dichloropropane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
tetrachloroethene	**3**	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
dibromochloromethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,2-dibromoethane (EDB)	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
chlorobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,1,1,2-tetrachloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
ethylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
m&p-xylenes	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D

Absolute Resource associates

Project ID: Medfield 19039
Job ID: 53494
Sample#: 53494-003
Sample ID: Flow New High
Matrix: Water
Sampled: 6/22/20 8:20

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
o-xylene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
styrene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
bromoform	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
isopropylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,1,2,2-tetrachloroethane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,2,3-trichloropropane	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
n-propylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
bromobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,3,5-trimethylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
2-chlorotoluene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
4-chlorotoluene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
tert-butylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,2,4-trimethylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
sec-butylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,3-dichlorobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
4-isopropyltoluene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,4-dichlorobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,2-dichlorobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
n-butylbenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,2-dibromo-3-chloropropane (DBCP)	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,2,4-trichlorobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
hexachlorobutadiene	< 0.5	0.5	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
naphthalene	< 5	5	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
1,2,3-trichlorobenzene	< 2	2	ug/L	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
Surrogate Recovery		**Limits**								
dibromofluoromethane SUR	**98**	78-114	%	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
toluene-D8 SUR	**101**	88-110	%	1	LMM		2002717	6/24/20	8:06	SW5030C8260D
4-bromofluorobenzene SUR	**98**	86-115	%	1	LMM		2002717	6/24/20	8:06	SW5030C8260D

Absolute Resource associates
124 Heritage Avenue #16
Portsmouth, NH 03801
603-436-2001
absoluteresourceassociates.com

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

53494 Lab ID Here

Company Name: X DP
Company Address:
Report To:
Phone #:
Invoice to:
Email:
PO #: No charge per Aaron

Project Name: Medfield
Project #: 19039
Project Location: NH MA ME VT
Accreditation Required? N/Y:
Protocol: RCRA MCP SDWA NHDES NPDES DOD
Reporting Limits: QAPP EPA DW GW-1 Other S-1
Quote #
☐ NH Reimbursement Pricing

ANALYSIS REQUEST

Lab Sample ID (Lab Use Only)	Field ID	# CONTAINERS	Matrix: WATER	Matrix: SOLID	Matrix: OTHER	Preservation Method: HCl	Preservation Method: HNO_3	Preservation Method: H_2SO_4	Preservation Method: NaOH	Preservation Method: MeOH	Sampling: DATE	Sampling: TIME	Sampling: SAMPLER	☒ VOC 8260	☐ VOC 624	☐ VPH MADEP	☐ VOC 524.2	☐ TPH	☐ 8270PAH	☐ 8082 PCB	☐ O&G 1664	☐ pH	☐ TSS	☐ RCRA Metals	☐ Total Metals-list:
53494-01	Cont		X			X					6/22/20	800	LL	X											
02	Flow New Mid		X			X						815		X											
03	Flow New High		X			X					↓	820	↓	X											

Lab Sample ID (Lab Use Only)	☐ Dissolved Metals-list:	☐ Ammonia	☐ COD	☐ TKN	☐ TN	☐ TON	☐ TOC	☐ Ferrous Iron	☐ T-Phosphorus	☐ Bacteria P/A	☐ Bacteria MPN	☐ Enterococci	☐ Cyanide	☐ Sulfide	☐ Nitrate + Nitrite	☐ Ortho P	☐ Phenols	☐ Nitrate	☐ Nitrite	☐ Chloride	☐ Sulfate	☐ Bromide	☐ Fluoride	☐ Corrosivity	☐ Reactive CN	☐ Reactive S-	☐ Ignitability/FP	☐ TCLP Metals	☐ TCLP VOC	☐ TCLP SVOC	☐ TCLP Pesticide	Subcontract: ☐ Grain Size	☐ Herbicides	☐ Asbestos	☐ PFAS	Grab (G) or Composite (C)
53494-01																																			
02																																			
03																																			

TAT REQUESTED
Priority (24 hr)* ☐
Expedited (48 hr)* ☐
Standard (10 Business Days) ☐
*Date Needed 6/24/20

See absoluteresourceassociates.com for sample acceptance policy and current accreditation lists

SPECIAL INSTRUCTIONS Please analyze Cont. Last - will have ~10,000 ug/L ACE All others Stated Below

REPORTING INSTRUCTIONS ☐ PDF (e-mail address) ☐ HARD COPY REQUIRED ☐ EDD

RECEIVED ON ICE ☑ YES ☐ NO
TEMPERATURE C

CUSTODY RECORD
QSD-01 Revision 3/12/18

	Date	Time		Date	Time
Relinquished by Sampler:			Received by:	6/22/20	1320
Relinquished by:	6/22/20	13:30	Received by:		
Relinquished by:	6/22/20	1414	Received by Laboratory:	6/22/20	14:14

APPENDIX D

Construction Plans & Specifications

SPD AREA REMEDIATION AT THE FORMER MEDFIELD STATE HOSPITAL

PROJECT NUMBER ABC0000-ZY1

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE FOR ADMINISTRATION AND FINANCE
DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE
OFFICE OF PLANNING, DESIGN AND CONSTRUCTION

NOVEMBER 2020

DCAMM Approvals

Project Engineer Date

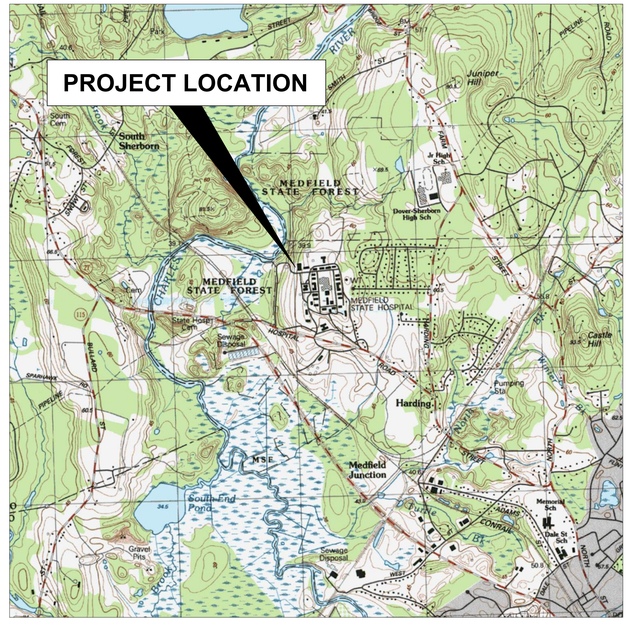
Project Manager Date

Deputy Director Date

Director Date

This signature block is to be included for all preliminary submissions. It is not to be included on final submission sets for bid or construction.

LIST OF DRAWINGS:



LOCUS MAP
NOT TO SCALE

Weston & Sampson SM

Weston & Sampson Engineers, Inc.
55 Walkers Brook Drive, Suite 100
Reading, MA 01867
978.532.1900 800.SAMPSON
www.westonandsampson.com

NOT FOR CONSTRUCTION

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE
OFFICE OF PLANNING, DESIGN AND CONSTRUCTION

ONE ASHBURTON PLACE
15TH FLOOR
BOSTON, MA 02108

(617) 727-4050 (TEL) / (617) 727-5363 (FAX)
www.mass.gov/dcamm

FORMER MEDFIELD STATE HOSPITAL
DCAMM PROJECT NUMBER ABC0000-ZY1
NOVEMBER 2020

DIVISION OF CAPITAL ASSET MANAGEMENT & MAINTENANCE

LEGEND

DESCRIPTION	EXISTING	PROPOSED
SANITARY SEWER	S	8"S PVC
FORCE MAIN	FM	6"FM DI
WATER MAIN	W	6"W DI
STORM DRAIN	D	18"D RCP
GAS	G	4"G
UNDERGROUND ELECTRIC	UE	UE
UNDERGROUND TELEPHONE	T	T
OVERHEAD WIRES	OW	OW
AREA TO BE DEMOLISHED OR EQUIPMENT TO BE REMOVED		
SANITARY SEWER MANHOLE	S	SMH
STORM DRAIN MANHOLE	D	SDMH
ELECTRICAL MANHOLE	E	EMH
TELEPHONE MANHOLE	T	TMH
CLEANOUT		CO
CATCH BASIN		CB
HYDRANT		
GATE VALVE	GV	
CHECK VALVE		
CURB STOP		
BUTTERFLY VALVE		
BALL VALVE		
REDUCER		
CAP OR PLUG		
GAS GATE VALVE	GV	
UTILITY POLE		
LIGHT POST		
EDGE OF PAVEMENT		
EDGE OF UNPAVED ROAD		
CURB		
SIDEWALK		
RAILROAD		
STONE WALL		
RETAINING WALL	RET WALL	RET WALL
FENCE	X X	X X
INDIVIDUAL DECIDUOUS TREE		
INDIVIDUAL EVERGREEN TREE		
TREE LINE		
SURVEY MARKER		
PROPERTY LINE	PL	
EASEMENT LINE		
LIMIT OF WORK		
SPOT ELEVATIONS	x 141.5	x 141.5
CONTOUR LINES	56	56
DEPRESSION CONTOUR LINES		
WETLAND		
EDGE OF WETLAND		1 2
BOLLARD	B	B
SIGN		
BENCH MARK		
TEST PIT	1	TP-1
SOIL BORING		
MONITORING WELL		
EROSION AND SEDIMENTATION CONTROLS		
ROCK OUTCROP		
DRAINAGE DITCH / SWALE		
TRANSFORMER	T	

NOTE: ITEMS SHOWN IN THE LEGEND MAY NOT BE PRESENT IN THESE PLANS

EROSION AND SEDIMENTATION CONTROL NOTES

1. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN EROSION AND SEDIMENT CONTROLS (I.E., COMPOST FILTER TUBES, SILT FENCING, CATCH BASIN INSERTS, ETC.) FOR THE DURATION OF THE PROJECT. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE FURNISHED, INSTALLED, MAINTAINED, AND REPLACED BY THE CONTRACTOR TO ENSURE THAT SEDIMENT-LADEN WATER DOES NOT LEAVE THE LIMITS OF WORK AT THE PROJECT SITE PER SHEET C2-001: SOIL BLENDING PLAN AND SPECIFICATION SECTION 312500 -EROSION AND SEDIMENTATION CONTROLS.
2. INSPECT ALL EROSION AND SEDIMENT CONTROL MEASURES, FACILITIES AND DEVICES DAILY AND AFTER EACH STORM EVENT DURING CONSTRUCTION, AND WEEKLY DURING PERIODS OF INACTIVITY. REPAIR ANY DISLOCATED OR OTHERWISE DAMAGED EROSION AND SEDIMENTATION CONTROLS IMMEDIATELY FOLLOWING FIRST OBSERVANCE OF THE DAMAGE.
3. THE CONTRACTOR SHALL MAINTAIN A SUFFICIENT RESERVE OF VARIOUS EROSION CONTROL MATERIAL ONSITE AT ALL TIMES FOR EMERGENCY PURPOSES.
4. CONSTRUCTION SITE WASTE MATERIALS SHALL BE PROPERLY CONTAINED ONSITE AND DISPOSED OFF SITE IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.
5. THE CONTRACTOR SHALL MAINTAIN SURFACE DRAINAGE DURING CONSTRUCTION. STORMWATER FLOWS SHALL BE DIVERTED AWAY FROM ACTIVE WORK ZONES AND MANAGED SUCH THAT THE EROSION OF DISTURBED AND UNDISTURBED AREAS IN PREVENTED.
5. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 14 DAYS OF COMPLETION OF WORK IN THAT AREA. DISTURBED AREAS SHALL BE REPAIRED AND COVERED WITH A MINIMUM OF 6 INCHES OF LOAM AND SEEDED AS PART OF SITE RESTORATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR WATERING SEEDED AREAS TWICE A WEEK FOR SIX WEEKS FOLLOWING SUBSTANTIAL COMPLETION.
6. SEEDED AREAS THAT HAVE WASHED AWAY SHALL BE FILLED AND GRADED AS NECESSARY AND THEN RESEEDED. A BURLAP OR STRAW COVER WILL BE APPLIED TO RETAIN THE SEED UNTIL IT HAS A CHANCE TO ROOT PROPERLY.

GENERAL NOTES

1. BASE TOPOGRAPHIC SURVEY PLAN PREPARED BY COL-EAST, INC., DATED AUGUST 2, 2010, WITH ADDITIONAL SURVEY PERFORMED BY WESTON & SAMPSON IN DECEMBER 2010 AND JANUARY 2011.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SITE RELATED DUST CONTROL. WATER USED FOR DUST CONTROL SHALL BE FREE OF SALT, OIL, AND OTHER DELETERIOUS MATERIALS. CONTRACTOR SHALL PROVIDE ALL NECESSARY WATER. SEE SECTION 011419.16 - DUST CONTROL FOR ADDITIONAL DETAILS.
3. BEFORE COMMENCING SITE WORK IN ANY AREA, CONTACT "DIG SAFE" AT 811 OR 1-888-344-7233, AND ALL UTILITY COMPANIES NOT COVERED BY "DIG SAFE" INCLUDING THE TOWN OF MEDFIELD WATER AND SEWER DIVISION, TO ACCURATELY LOCATE UNDERGROUND UTILITIES, AT LEAST 72 HOURS, SATURDAYS, SUNDAYS, AND HOLIDAYS EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. ANY DAMAGE TO EXISTING UTILITIES OR STRUCTURES AS SHOWN ON THE PLANS SHALL BE THE CONTRACTOR'S RESPONSIBILITY. COSTS FOR REPAIR OF SUCH DAMAGE SHALL BE THE CONTRACTOR'S RESPONSIBILITY. NO EXCAVATION SHALL BE DONE UNTIL UTILITY COMPANIES AND THE TOWN OF MEDFIELD WATER AND SEWER DIVISION ARE PROPERLY NOTIFIED.
4. THE CONTRACTOR SHALL PROTECT ALL UNDERGROUND UTILITIES AND UTILITY FACILITIES INSIDE AND OUTSIDE OF THE CONTRACT LIMIT OF WORK FROM EXCESSIVE VEHICULAR LOADS DURING CONSTRUCTION. ANY DAMAGE TO THESE FACILITIES RESULTING FROM CONSTRUCTION LOADS WILL BE RESTORED TO ORIGINAL CONDITION AT NO COST TO DCAMM.
5. CONTRACTOR SHALL ONLY UTILIZE AREA WITHIN THE LIMITS OF WORK FOR VEHICLE AND EQUIPMENT STORAGE, AND TEMPORARY MATERIAL STAGING. SEE SPECIFICATION SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS FOR ADDITIONAL DETAILS.
6. PARKING AREAS, CURBS, AND LANDSCAPE AREAS OUTSIDE THE LIMIT OF DISTURBANCE ARE TO REMAIN UNDISTURBED/UNDAMAGED DURING REMEDIATION WORK. ANY AREA OUTSIDE OF THE LIMIT OF WORK THAT IS DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO COST TO DCAMM.
7. THE CONTRACTOR SHALL MAKE ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY PERMITS, PAY ALL FEES AND POST ALL BONDS ASSOCIATED WITH THE SAME, AND COORDINATE WITH DCAMM AND THE ENGINEER.
8. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR JOB SITE SAFETY. THE CONTRACTOR SHALL PROVIDE TEMPORARY FENCING AND/OR BARRIERS AROUND ALL OPEN EXCAVATED AREAS, AND CONDUCT ALL WORK IN ACCORDANCE WITH OSHA STANDARDS AND REQUIREMENTS. THE CONTRACTOR SHALL BE AWARE OF THE PUBLIC USE PORTIONS OF THE PROPERTY AS A PARK AND SHALL SECURE THE WORK AREA DURING CONSTRUCTION AND AT THE END OF EACH WORK DAY.
9. IF ANY DEVIATION OR ALTERATION OF THE WORK PROPOSED ON THESE DRAWINGS IS REQUIRED, THE CONTRACTOR IS TO IMMEDIATELY CONTACT AND COORDINATE WITH THE ENGINEER AND DCAMM.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING OF ALL CONSTRUCTION VEHICLES PRIOR TO EXITING THE LIMIT OF WORK PER SPECIFICATION SECTION 013543 - ENVIRONMENTAL PROTECTION PROCEDURES.
11. LOCATIONS OF EXISTING PIPES, CONDUITS, UTILITIES, FOUNDATIONS AND OTHER UNDERGROUND OBJECTS ARE NOT WARRANTED TO BE CORRECT AND THE CONTRACTOR SHALL HAVE NO CLAIM ON THAT ACCOUNT SHOULD THEY BE OTHER THAN SHOWN. CONTRACTOR SHALL CONTACT DIGSAFE AND APPROPRIATE AGENCIES/UTILITY COMPANIES AS NECESSARY.
12. THE CONTRACTOR SHALL VISIT AND EXAMINE THE SITE DURING PROJECT BIDDING TO FULLY UNDERSTAND ALL THE CONDITIONS PERTAINING TO THE WORK, UNDERSTAND DIFFICULTIES TO BE ENCOUNTERED, UNDERSTAND THE SCOPE OF THE WORK WHETHER SHOWN OR DESCRIBED, AT NO ADDITIONAL COST TO DCAMM. THE EXACT LOCATION OF EXISTING UTILITIES, SUBSURFACE CONDITIONS, SITE FEATURES/ANCILLARY ITEMS, SERVICES, ETC., ARE TO BE FIELD VERIFIED.
13. ALL WORK UNDER THIS CONTRACT SHALL BE LIMITED TO THE "LIMIT OF WORK" BOUNDARY SHOWN ON THE DRAWINGS UNLESS OTHERWISE INDICATED IN THE SPECIFICATIONS OR REQUIRED BY THE ENGINEER.
14. THE CONTRACTOR SHALL CONDUCT ALL REMEDIATION/EXCAVATION ACTIVITY BETWEEN 7:00 A.M. AND 5:00 P.M., MONDAY THROUGH FRIDAY UNLESS OTHERWISE REQUIRED BY DCAMM.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN-UP AND PROPER DISPOSAL OF SOIL, SEDIMENT OR OTHER MATERIAL TRACKED ONTO HOSPITAL ROAD.
16. CONTRACTOR SHALL COORDINATE WITH TOWN OF MEDFIELD WATER DEPARTMENT DURING UTILITY DISCONNECTION/CUTS/CAP. CONTRACTOR SHALL COORDINATE SUCH THAT ALARMS ASSOCIATED WITH THE CAMPUS WATER TANKS ARE NOT INADVERTENTLY ACTIVATED.

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Project Name:
SPD AREA REMEDIATION AT THE FORMER MEDFIELD STATE HOSPITAL

DCAMM Project Number
AAA0000-DC1

Project Location
45 HOSPITAL ROAD, MEDFIELD MA

Project Architect

Project Consultant
Weston & Sampson
Weston & Sampson Engineers, Inc.
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CAMIS Number: -
Building Number: -
Secretariat: -

Original Issue Date
AUGUST 2019

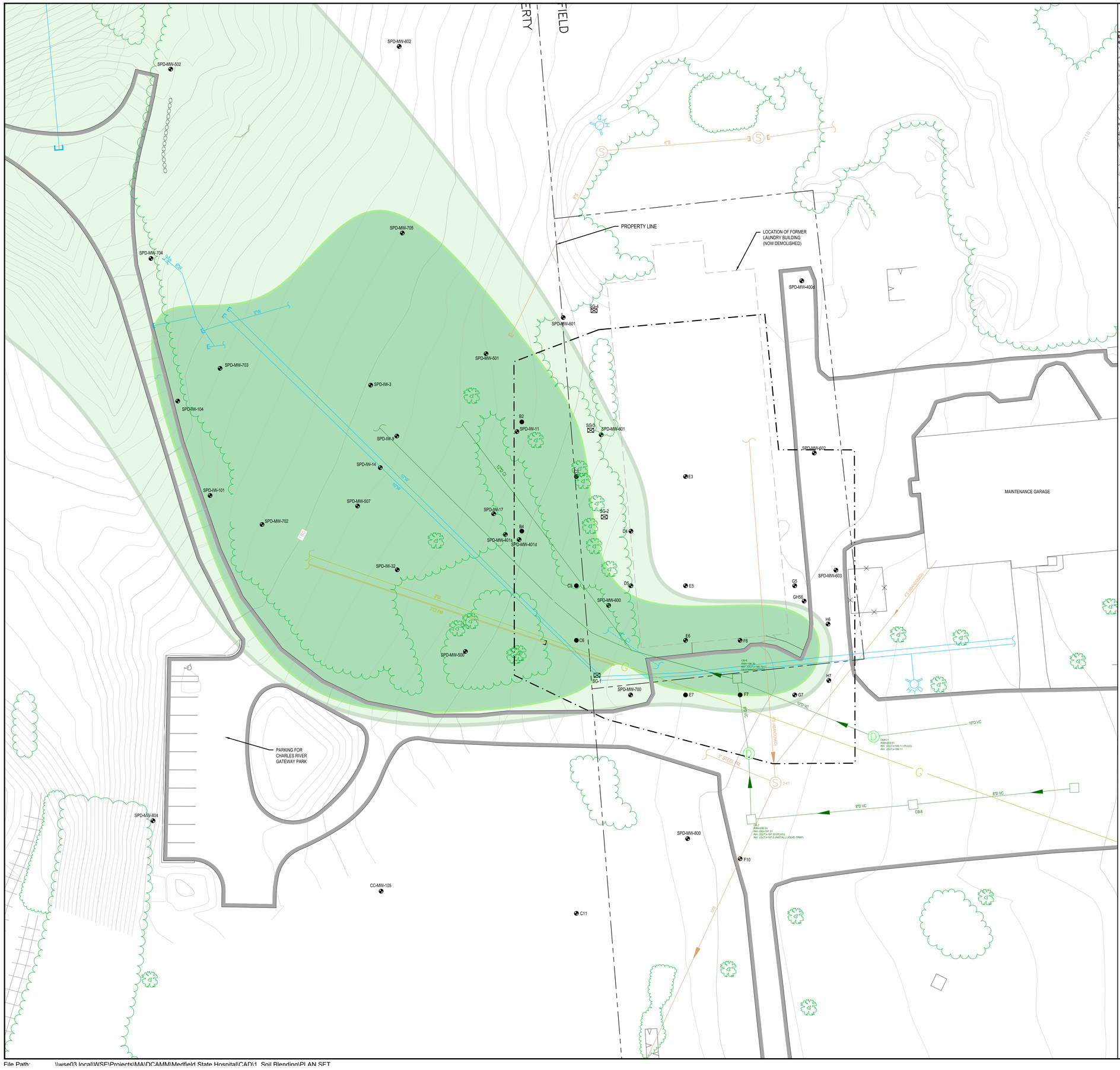
Revisions

No.	Description	Date

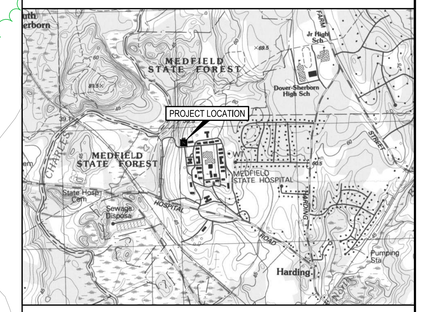
Plan Name:
GENERAL NOTES AND LEGEND

Drawing Number:
G1-001
Drawing 2 of 6

File Path: \\wse03.local\WSE\Projects\MA\DCAMM\Medfield State Hospital\CAD\1_Soil Blending\PLAN SET



KEY PLAN
NOT TO SCALE



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SCALE: 1"=20'

LEGEND:

- EXTENTS OF FORMER LAUNDRY BUILDING
- LIMIT OF WORK
- PROPERTY BOUNDARY
- STEAM LINE
- SEWER LINE
- DRAIN LINE
- WATER LINE
- GAS LINE
- CAPPED/PLUGGED UTILITY LOCATION
- 180 ELEVATION CONTOUR (FEET)
- WESTON & SAMPSON SOIL BORING
- WESTON & SAMPSON MONITORING WELL
- PCE CONCENTRATIONS > GW-1 (5-49 ug/L)
- PCE CONCENTRATIONS > GW-2 (50-230 ug/L)
- TREE
- TREE LINE

NOTES:

1. GROUNDWATER DATA COLLECTED FROM MARCH 2015 TO MAY 2020.
2. PCE IS TETRACHLOROETHYLENE.
3. ISO CONTOURS ARE BASED ON INTERPOLATION OF MAY 2020 PCE RESULTS.
4. TREE LOCATIONS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY CONTRACTOR.

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Revisions
No. Description Date

Plan Name:
EXISTING CONDITIONS SITE PLAN

Drawing Number:
C1-001
Drawing 3 of 6

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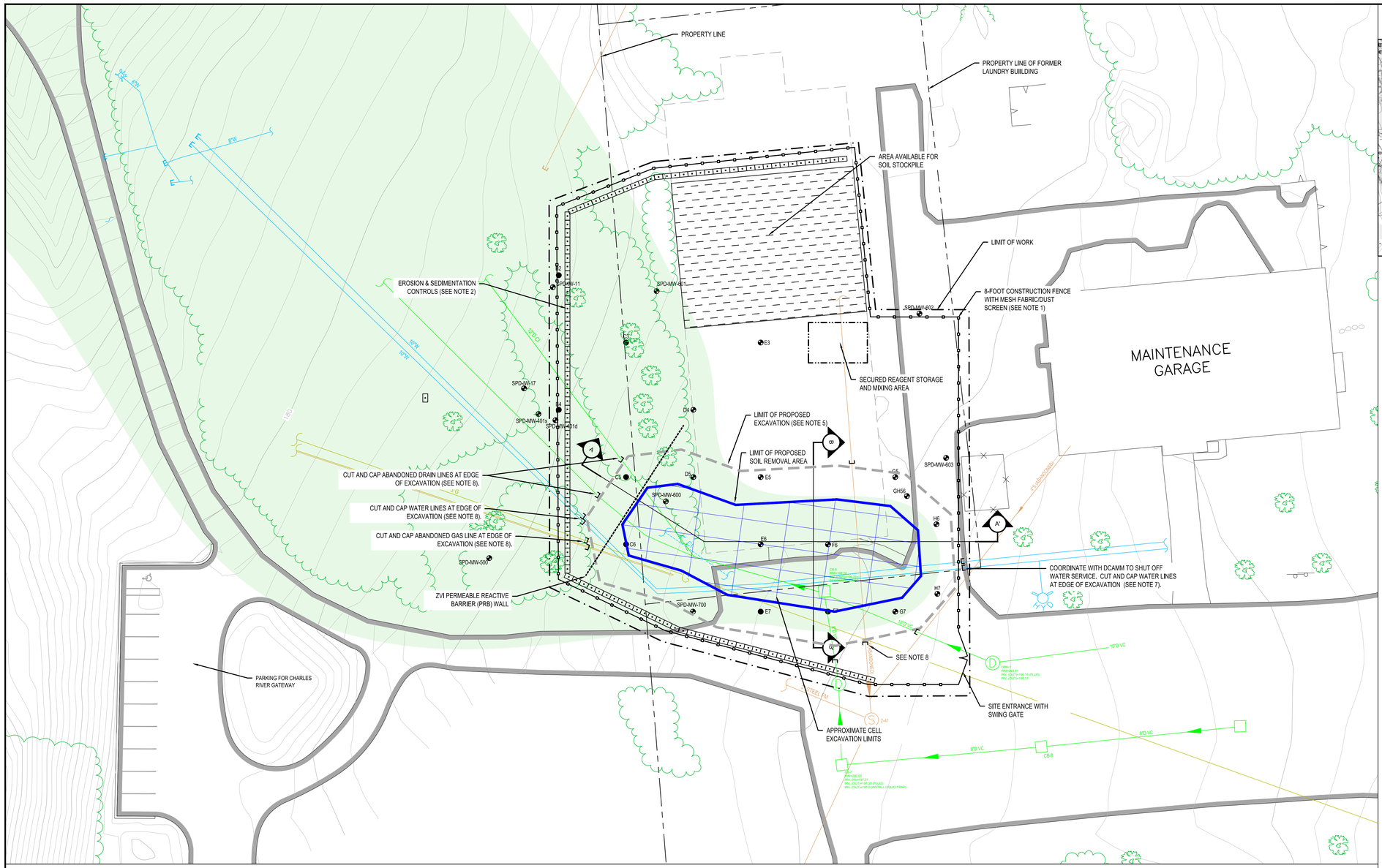

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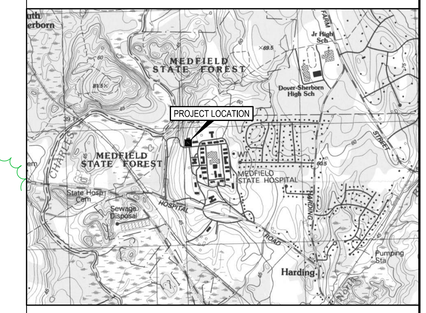

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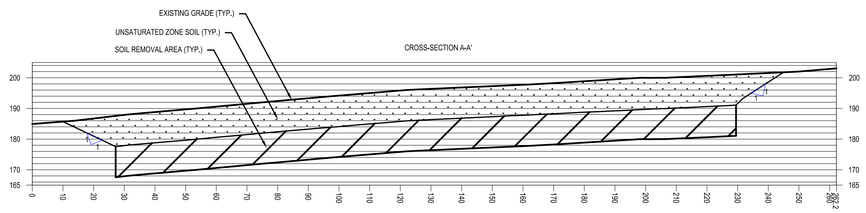
SCALE: 1"=20'

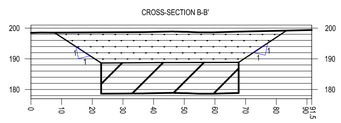
LEGEND:

- PROPERTY BOUNDARY
- SEWER LINE
- DRAIN LINE
- WATER LINE
- GAS LINE
- CAPPED/PLUGGED UTILITY LOCATION
- 180 ELEVATION CONTOUR (FEET)
- WESTON & SAMPSON SOIL BORING
- WESTON & SAMPSON MONITORING WELL
- SOURCE SOIL REMOVAL AREA
- UNSATURATED ZONE SOIL EXCAVATION
- EXISTING FENCE
- TEMPORARY 8-FOOT CONSTRUCTION FENCE
- LIMIT OF WORK
- PROPOSED SECURED REAGENT STORAGE AND MIXING AREA
- EROSION AND SEDIMENTATION CONTROLS
- PROPOSED STOCKPILE AREA FOR UNSATURATED ZONE SOILS

NOTES:

1. THE CONTRACTOR SHALL INSTALL AN 8-FOOT TEMPORARY CONSTRUCTION CHAIN LINK FENCE WITH MESH FABRIC/DUST SCREEN IN ACCORDANCE WITH SPECIFICATION SECTION 323113 - CHAIN LINK FENCES AND GATES. THE PROPOSED FENCE ALIGNMENT IS APPROXIMATE AND THE CONTRACTOR MAY ADJUST ALIGNMENT AS NECESSARY TO COMPLETE THE WORK OF THE PROJECT WHILE ADEQUATELY SECURING THE WORK AREA.
2. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL INSTALL TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURED AS INDICATED AND IN ACCORDANCE WITH SPECIFICATION SECTION 312500 - EROSION AND SEDIMENTATION CONTROL MEASURES.
3. THE CONTRACTOR SHALL CLEAR AND GRUB AREAS WITHIN THE LIMIT OF WORK PER SPECIFICATION SECTION 311000 - SITE PREPARATION.
4. THE CONTRACTOR SHALL DECOMMISSION/REMOVE DESIGNATED MONITORING WELLS WITHIN THE LIMIT OF PROPOSED EXCAVATION AREA PER SPECIFICATION SECTION 027400 - MONITORING WELL DECOMMISSIONING, REMOVAL, AND PROTECTION.
5. THE CONTRACTOR SHALL REMOVE OVERBURDEN MATERIAL AND STOCKPILE ON-SITE. SATURATED ZONE SOIL SHALL BE EXCAVATED AND TRANSPORTED OFF-SITE FOR DISPOSAL/RECYCLING. ZERO VALENT IRON WILL BE BLENDED WITH THE OVERBURDEN AND USED AS BACKFILL PER SECTION 025000 - SITE REMEDIATION. IMPORTED MATERIAL SHALL BE PLACED ABOVE THE BACKFILLED MATERIAL. OVERBURDEN MATERIAL CONSTITUTES THE SOILS LOCATED ABOVE THE HIGH GROUNDWATER ELEVATION APPROXIMATELY 10-FEET BELOW GRADE.
6. EXCAVATED MATERIAL SHALL BE HANDLED IN ACCORDANCE WITH SECTIONS 026113 - EXCAVATION AND STOCKPILING OF IMPACTED MATERIAL AND 026116 - TRANSPORTATION AND DISPOSAL OF IMPACTED MATERIAL.
7. THE CONTRACTOR SHALL CONSTRUCT A ZVI PERMEABLE REACTIVE BARRIER WALL AS SPECIFIED IN SECTION 025000 - SITE REMEDIATION
8. IF ABANDONED UTILITIES ARE ENCOUNTERED DURING EXCAVATION ACTIVITIES, CUT AND CAP PIPES AT THE LOCATIONS SHOWN. REMOVE PIPING WITHIN THE LIMIT OF PROPOSED EXCAVATION IN ACCORDANCE WITH SPECIFICATION SECTION 023500 - UTILITY ABANDONMENT
9. IF ACTIVE WATER LINES ARE ENCOUNTERED DURING EXCAVATION ACTIVITIES, COORDINATE WITH DCAMM TO SHUT OFF WATER SERVICE. CUT AND CAP WATER LINES AT THE LOCATION SHOWN AND INSTALL CONCRETE THRUST BLOCK IN ACCORDANCE WITH SPECIFICATION SECTION 023500 - UTILITY ABANDONMENT. REMOVE WATER PIPING WITHIN THE LIMIT OF PROPOSED EXCAVATION.
10. REMOVE CATCHBASIN CB-6 AND ASSOCIATED DRAIN PIPING WITHIN LIMIT OF PROPOSED EXCAVATION.
11. CONTRACTOR SHALL COORDINATE AND PROVIDE ACCESS TO WEST DOOR OF MAINTENANCE GARAGE FOR DCAMM AND TOWN OF MEDFIELD.





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HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=20'

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DCAMM Project Number
AAA0000-DC1

Project Location
45 HOSPITAL ROAD, MEDFIELD MA

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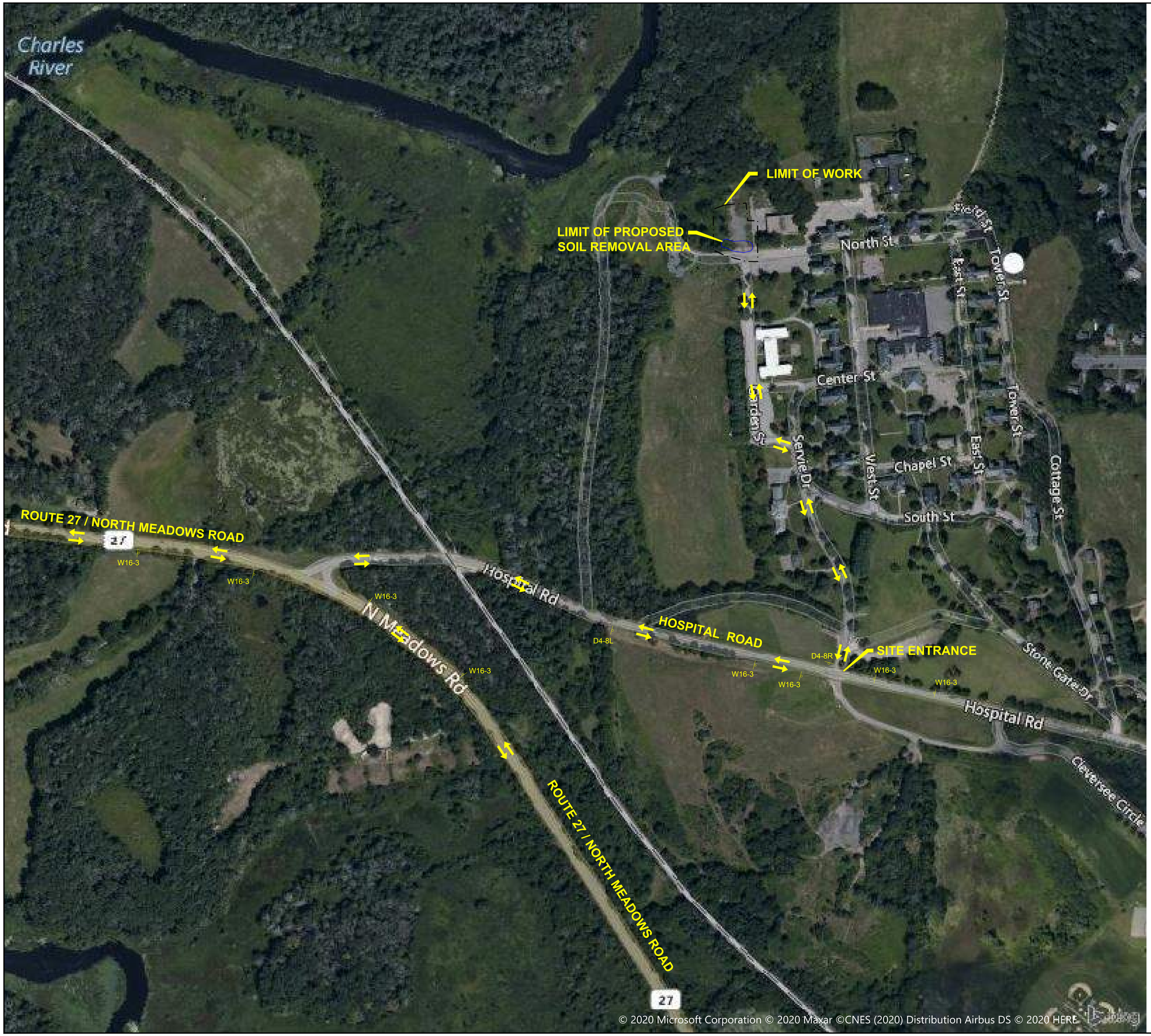
Plan Name:
SOIL BLENDING SITE PLAN

Drawing Number:
C2-001
Drawing 4 of 6

File Path: \\wse03.local\WSE\Projects\MA\DCAMM\Medfield State Hospital\CAD\1_Soil Blending\PLAN SET



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LEGEND

- LIMIT OF WORK
- LIMIT OF PROPOSED SOIL REMOVAL AREA
- TRAFFIC FLOW DIRECTION

TEMPORARY TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT
	WIDTH	HEIGHT	
W16-3	48"	48"	TRUCKS ENTERING ROADWAY
D4-8(R/L)	48"	36"	TRUCKS

NOTES:

1. ALL VEHICLE, EQUIPMENT, AND MATERIALS STAGING AND STORAGE WILL BE LIMITED TO WITHIN THE LIMITS OF WORK SHOWN ON THE DRAWING.
2. SIGNAGE SHALL HAVE AN ORANGE SIGN PANEL WITH BLACK LETTERS AND SHALL BE MOUNTED ON DOUBLE P-5 POSTS.
3. ALL MATERIAL HAULING VEHICLES SHALL BE COMPLETELY COVERED PRIOR TO LEAVING THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING ALL CONSTRUCTION VEHICLES PRIOR TO LEAVING THE SITE.
4. CONTRACTOR SHALL NOT OBSTRUCT ANY DRIVEWAYS OR SIDE STREETS. SHOULD ROAD CLOSURE BE NECESSARY AT ANY TIME, THE CONTRACTOR IS RESPONSIBLE FOR FILING THE APPROPRIATE NOTIFICATIONS AND RETAINING AND PAYING FOR ANY POLICE DETAILS.
5. THE CONTRACTOR IS DIRECTED TO USE WESTBOUND HOSPITAL ROAD TO ROUTE 27. NO TRUCK TRAFFIC IS ALLOWED EAST ON HOSPITAL ROAD TOWARD MEDFIELD CENTER.
6. CONTRACTOR SHALL MAINTAIN ROADS TO PROVIDE CONSTRUCTION SITE EGRESS.

150 75 0 150 300
SCALE: 1"=150'

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SITE ACCESS AND TRAFFIC PLAN

Drawing Number:
C2-002
Drawing 5 of 6

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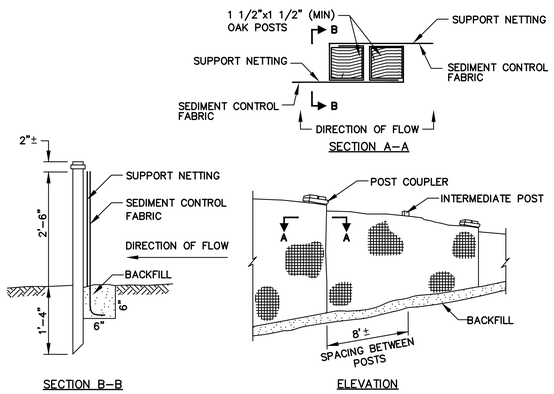

SILT FENCE DETAIL
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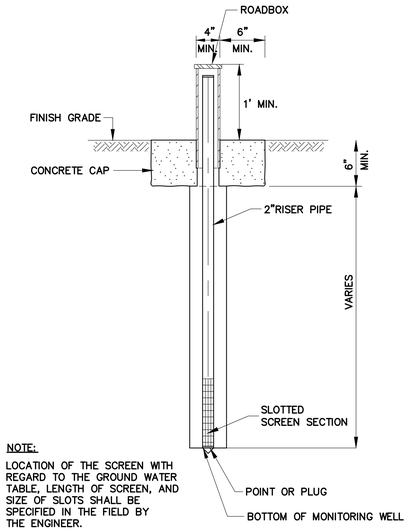
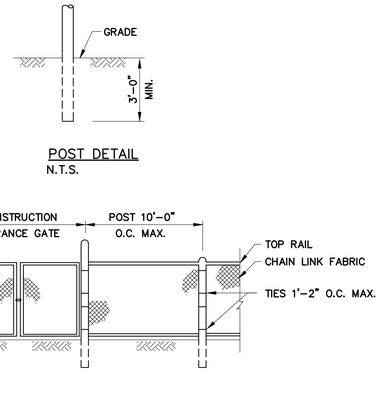


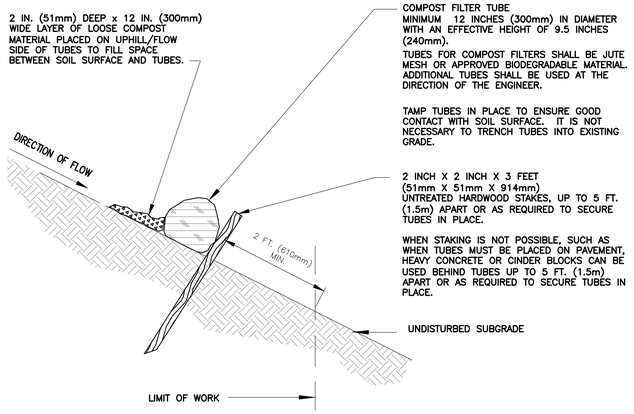
NOTE:
LOCATION OF THE SCREEN WITH REGARD TO THE GROUND WATER TABLE, LENGTH OF SCREEN, AND SIZE OF SLOTS SHALL BE SPECIFIED IN THE FIELD BY THE ENGINEER.

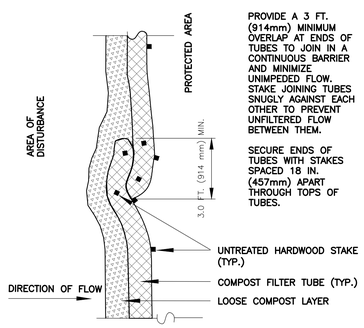
MONITORING WELL DETAIL
N.T.S.



POST DETAIL
N.T.S.

TEMPORARY CONSTRUCTION FENCE AND GATE DETAIL
N.T.S.



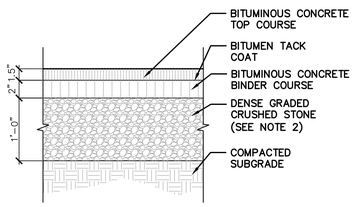


PLAN VIEW – JOIN DETAIL

GENERAL NOTES:

1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES (300mm) FOR SLOPES UP TO 50 FEET (15.24m) IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW. CURVE ENDS UPHILL TO PREVENT DIVERSION OF UNFILTERED RUN–OFF.
3. TUBES CAN BE PLACED DIRECTLY ON EXISTING PAVEMENT WHEN NECESSARY. SECURE THE COMPOST SOCKS WITH 18–24" STAKES EVERY 3–4' AND WITH A STAKE ON EACH END. STAKES SHOULD BE DRIVEN THROUGH THE MIDDLE OF THE SOCK LEAVING AT LEAST 2"–3" OF STAKE EXTENDING ABOVE THE SOCK. STAKES SHOULD BE DRIVEN PERPENDICULAR TO SLOPE FACE.
4. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN–OFF.
5. COMPOST SOCK CASING TO BE CONSTRUCTED OF NON–WOVEN GEOTEXTILE FILTER CLOTH OR BIODEGRADABLE JUTE MESH.
6. COMPOST SOCKS TO BE FILLED WITH BIODEGRADABLE STRAW FILL OR CHIPPED WOOD.

COMPOST FILTER TUBE DETAIL
N.T.S.



NOTE:
1. CONTRACTOR TO PROVIDE SMOOTH TRANSITION WHERE NEW PAVEMENT ABUTS EXISTING PAVEMENT.
2. IN AREAS OF THE FORMER BUILDING FOUNDATION AS SHOWN ON C–1, DENSE–GRADED CRUSHED STONE IS ALREADY IN PLACE TO EXISTING GRADE. CONTRACTOR SHALL RE–USE AND COMPACT EXISTING DENSE–GRADED CRUSHED STONE AS APPROPRIATE AS BASE MATERIAL.

BITUMINOUS CONCRETE PAVEMENT DETAIL
N.T.S.

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CONSTRUCTION DETAILS

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D1-001
Drawing 6 of 6

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SECTION 011000

SUMMARY

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Equality of material, article, assembly or system other than those named or described in this Section shall be determined in accordance with the provisions of Article V of the GENERAL CONDITIONS OF THE CONTRACT.

C. The following terms shall be applicable to these Specifications:
1. "**Owner and DCAMM**": Refers to the Division of Capital Asset Management and Maintenance (DCAMM), One Ashburton Place, 15th Floor, Boston, Massachusetts 02108. Senior Operations Manager James Kruckas at 617-955-6402.
2. "**Engineer**": Refers to Weston & Sampson Engineers, Inc., 55 Walkers Brook Drive, Suite 100, Reading, Massachusetts 01867. Project Engineer: Frank Ricciardi PE, LSP. at 978-532-1900.
3. "**Contractor**": Refers to the General Contractor who has been awarded the overall contract for work outlined by the Contract Documents.
4. "**Subcontractor**": Refers to any Contractor who is working under the direct supervision of the General Contractor including but not limited to, asbestos abatement, waste management, and trucking/transport companies.
5. "**LSP-of-Record**": Refers to Weston & Sampson, Inc., 55 Walkers Brook Drive, Suite 100, Reading, Massachusetts 01867: LSP-of-Record: Frank Ricciardi, P.E., LSP at 978-532-1900.

1.2 REQUIREMENTS INCLUDED

A. This Section includes requirements for the following:

1. Work under this Contract.
2. Regulatory Constraints.
3. Work Sequence.
4. Examination of Site and Documents.
5. Contractor Qualifications.
6. Contract Method.
7. Supervision of Work.
8. Use of Premises.
9. Coordination.
10. Field Engineering.

11. Reference Standards.
12. Preconstruction Conference.
13. Project Meetings.
14. Permits, Inspection, and Testing Required by Governing Authorities.
15. Cutting, Coring, Patching, Unless Otherwise Indicated.
16. Existing Utilities.
17. Debris Removal.
18. Intent of Documents.
19. Work by DCAMM.
20. Work by the Engineer.
21. Protection of Existing Conditions.
22. Subcontractor.
23. Field Measurements.
24. Safety Regulations.
25. OSHA Safety and Health Course Documentation.
26. Damage Responsibility.
27. Owner Furnished Products.
28. User Agency Occupancy.
29. Asbestos and Hazardous Materials Discovery.
30. Special Requirements.
31. List of Drawings.

1.3 WORK UNDER THIS CONTRACT

A. The main project work consists of the excavation and stockpiling of native unsaturated zone soils to be treated with zero-valent iron (ZVI); excavation, transportation and disposal of saturated zone soils; performance dewatering, as needed; treatment of till interface at bottom of excavation; construction of a permeable reactive barrier (PRB) wall; and backfilling and site restoration in the SPD Area of the former Medfield State Hospital, 45 Hospital Road in Medfield, Massachusetts. Establishment of environmental controls, site clearing and provision of security measures are also key components of this project. Please refer to Drawing sheet C-2 for the location of the remediation area hereby referred to as the Source Area Remediation Area.

B. General Project Information to be performed under this Contract shall include, but will not be limited to, the following construction operations:

1. Applying for, paying for, and securing any and all permits, notifications, waivers, etc. required from local, state, and federal agencies, and other authorities having jurisdiction over work on the Site, including submitting, revising, and re-submitting all required plans, permits, and notifications.
2. Compliance with the terms and conditions issued with the permits for this project. Note that the limits of work are outside and upgradient of wetlands, wetland buffer and the Charles River.
3. Submission of Project Plans including, but not limited to, an Excavated Materials Management Plan (EMMP), Remediation Work Plan, and a Health and Safety Plan.
4. Installation of temporary construction/security fencing and gates to the general alignment shown on the Drawings. All fencing shall be installed with a dust screen.
5. Installation and maintenance of all erosion control measures including, but not limited to, silt fence and compost socks, as specified herein, as shown on the Drawings, and other

project permits. The Contractor shall immediately correct any erosion outside the limits of work at no additional cost to the Owner.

6. Clearing and grubbing of the Source Area Remediation Area as shown on the Drawings. Organic material (including tree trunks and brush) shall be collected and chipped for use as mulch on-site.
7. Installation of a secure fenced and locked staging area for the storage of excavated materials, ZVI, and other equipment and materials.
8. Protection of existing utilities, roadways, sidewalks, monitoring wells and other features outside of the Limit of Work and/or not designated for removal.
9. Abandon and/or remove existing utilities, abandon existing designated monitoring wells within the Source Area Remediation Area.
10. Excavate and stockpile native unsaturated zone soil to a depth of eight to ten feet below existing grade as shown on the Drawings.
11. Blend stockpiled unsaturated zone soil with ZVI in accordance with Section 025000 – Site Remediation.
12. Excavation of the saturated zone tetrachloroethylene (PCE) impacted soil from historic high groundwater table up to approximately 22 feet below grade.
13. Dewatering as needed in accordance with the Contract Documents and Massachusetts Contingency Plan (MCP) requirements.
14. Soil disposal characterization and offsite disposal of saturated zone PCE-impacted soil in accordance with the Contractor's EMMP.
15. Treatment of the tight-till interface at the bottom of excavation by soil blending the top 12 inches with ZVI or placement of one 12-inch lift of soil treated with a high dose of ZVI in accordance with Section 025000 – Site Remediation.
16. Construction of a permeable reactive barrier (PRB) wall comprised ZVI per Section 025000 – Site Remediation at and extending beyond the west extent of the excavation as shown on the Contract Drawings.
17. Backfill of the saturated zone and compaction per Section 025000 – Site Remediation with ZVI-treated unsaturated zone soils. Placement and compaction of imported clean fill in unsaturated zone to restore the site to existing grade.
18. The Contractor shall re-pave asphalt paved areas within the Source Area Remediation Area. In areas of existing gravel, the Contractor shall restore with gravel to match pre-construction conditions.
19. Remove and properly dispose of erosion control measures at project completion.
20. Install monitoring wells in locations as specified by the Engineer on the Contract Drawings.
21. Submittal of close-out documents including:
    a. As-built plan with surveyed and geo-referenced locations of each day's soil treatment cell and ID in AutoCAD;
    b. Corresponding Excel tabulated cell ID and dosing information; and
    c. All monitoring data.

C. Reference To Drawings: The work to be done under this Contract is shown on the Drawings listed at the end of this Section.

D. The Contractor shall provide a schedule for completion of the project to DCAMM within the construction period set forth in the Contract.

E. The Massachusetts Standard Labor Wage rates contained in the Contract Documents, as updated on an annual basis, will be used throughout the construction of this project.

1.4 WORK SEQUENCE

A. The Work will be conducted in the following general project sequence:

1. Mobilization
2. Site Preparation
3. Abandonment of utilities (if encountered) and removal of existing monitoring wells and injection points.
4. Soil excavation and stockpiling
5. Soil blending stockpiled unsaturated zone soils
6. Soil blending till interface or placement of 12 inches of ZVI-treated soil
7. Construction of PRB wall
8. Backfill and compaction
9. Installation of new monitoring wells
10. Site restoration, paving and plantings
11. Demobilization

For phases of work requiring submittals, the Contractor may not begin the phase of work until he/she has obtained Engineer approval of the associated submittal.

B. The Contractor is directed to use westbound Hospital Road to Route 27 for trucking to and from the Site. It is the Contractors responsibility to ensure any local permits are obtained. Should road closure be necessary at any time, the Contractor is responsible for filing the appropriate notifications and retaining and paying for any road details.

C. Schedule:
1. Start of Construction shall occur on/or before May 2021.
2. Substantial Completion shall occur before October 2021.
3. Finalization of all requirements of the project shall be complete by December 2021.

D. Upon finalization of the Contract (signified by Issuance of DCAMM's D-19: Notice to Proceed), the Contractor shall develop a Bar Chart Diagram (the Project Schedule) as defined hereinafter, demonstrating completion of all contract construction activities. This shall be submitted to DCAMM and the Engineer for review within 5 business days after the finalization of agreement. The Contractor shall keep the bar chart up to date in accordance with the progress and the logic update requirements stated herein, and shall utilize the bar chart in planning, coordinating and performing the work of this project including all construction-related activities of subcontractors. The Contractor's monthly payments will be made in direct relation to the specific activities scheduled and by the progress completion of those activities.

E. The Bar Chart Diagram shall show the logical sequence of activities required and shall reflect the manner in which actual work will be performed. The number of activities shown on the schedule shall be equal to the number of items listed in the Schedule of Values. Failure to include any element of work required for the performance of the contract shall not excuse the Contractor from completing all work required within the required contract completion date, notwithstanding DCAMM's acceptance of the schedule.

F. DCAMM reserves the right to request modifications to the proposed sequence of work after review of the Bar Chart Diagram and required Work Plan.

1.5 EXAMINATION OF SITE AND DOCUMENTS

A. A pre-bid conference will be held at the site on the date and the time indicated in the INVITATION TO BIDDERS. COVID safety precautions will be in effect for this conference.

B. Should the bidder find, during the examination of the Contract Documents or after visiting the Site, any discrepancies, omissions, ambiguities or conflicts in or among the Contract Documents, or be in doubt as to their meaning, he or she shall notify DCAMM and the Engineer and request interpretation.

C. The bidders are expected to examine and be thoroughly familiar with all contract documents and with the conditions under which the work is to be carried out. The Commonwealth will not be responsible for errors, omissions, and/or charges for extra work arising from the bidder's failure to familiarize themselves with the Contract Documents and existing conditions. By submitting a bid, the bidder agrees and warrants that he had the conditions and requirements of both, where they require, in any part of the work a given result to be produced, that the contract documents are adequate and he will produce the required results.

D. Contact: Jason Kruckas, DCAMM Senior Operations Manager may be contacted to arrange a site visit at 978-733-3416.

1.6 CONTRACTOR QUALIFICATION

A. Contractor shall fully meet the conditions of Section 011500 Special Conditions for award of project.

B. The apparent low bidder shall submit to DCAMM within 48 hours of the Bid opening a certification in writing that it has successfully performed on at least three recent (within the last 5 years) remediation projects of equivalent size and complexity and submit the following information for these projects:

1. Project description demonstrating remediation projects of equivalent size and complexity
2. Sitework Value in dollars
3. Date work was conducted
4. Reference with contact information

This information shall be submitted to the Engineer by email, letter, or standard US mail.

C. The apparent low bidder shall also submit within 48 hours of the bid opening, documentation indicating that the required bonds and insurance certification have been requested for the associated bonding and insurance companies for this work. Failure to provide this documentation within the specified timeframe may result in the apparent low bidder being removed from consideration and the next apparent low bidder selected to implement the project.

D. The issuing of Bid Documents by DCAMM shall not be construed as pre-qualifications of that bidder.

1.7 CONTRACT METHOD

A. Work under this contract shall be lump sum price, for the scopes of work as described in these specifications and shown on the Drawings.

B. Should certain additional work be required, or should the quantities of certain classes of work be increased or decreased from those required by the Contract Documents, by authorization of DCAMM, the unit prices provided by the Bidder as part of his/her bid shall, at the option of DCAMM, be the basis of payment to the Contractor or credit to DCAMM, for such increase or decrease in the work. Additional information on Unit Prices is presented in Section 012200-UNIT PRICES.

C. The Massachusetts Standard Labor Wage rates, as outlined in the Contract exhibits, will be used for this Project.

1.8 SUPERVISION OF WORK

A. The Contractor shall be held directly responsible for the correct installation of all work performed under this Contract. The Contractor must make good repair, without expense to the Commonwealth, of any part of the new work, or existing work to remain, which may become inoperative on account of leaving the work unprotected or unsupervised during construction of the system or which may break or give out in any manner by reason of poor workmanship, defective materials or any lack of space to allow for expansion and contraction of the work during the Contractor's warranty period, from the date of final acceptance of the work by DCAMM.

B. The Contractor shall furnish a competent Massachusetts-licensed Construction Superintendent who is an employee of the Contractor, satisfactory to DCAMM and to the Engineer. The Project Superintendent shall supervise all work under this Contract and shall remain on duty at the Site throughout the Contract period while work is in progress. Submit the name and resume of the Superintendent for approval to DCAMM within 5 business days of the Notice to Proceed. Include experience with project of equal size and complexity.

1.9 USE OF PREMISES

A. Use of the Site: Limit use of the premises to work in areas indicated within the construction fence shown on the site drawings. Coordinate work of all trades required outside the construction fence boundary shown on the site drawings. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

1. Owner Occupancy: Allow for Owner occupancy and use by the public (if applicable).
2. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner’s employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Schedule and perform work to afford minimum of interruption to normal and continuous operation of utility systems. The Contractor shall submit to DCAMM and the Engineer for approval, proposed schedule for performing work; including construction of new utilities, re-routing of existing utilities and final connection of new work to existing work. Schedule shall indicate shutdown time required for each operation.

1. Work includes checking all safety devices to verify that they have come back on-line after interruption. This requirement will not be waived.

C. The Contractor shall notify DCAMM and Operating Agency in writing, 72 hours in advance of the proposed time for shutting down or interrupting any utilities, services or facilities which may affect the operation of other buildings, services or facilities of the Operating Agency.

D. Coordinate with DCAMM and the Engineer, work in connection with adjacent driveways, walks, or other facilities which would prevent access thereto or interrupt, restrict, or otherwise infringe upon the Operating Agency's use thereof.

E. The Contractor shall be aware of the sensitivity of the neighborhood organizations and adjacent public park to noise, dust, debris, vibration, and site maintenance and take appropriate precautions to avoid conflict.

F. Contractor, Subcontractors shall protect existing structures, surfaces, equipment and furnishing, and the like, and installed work to avoid any damage. Damage to existing work, if caused by the Contractor's operations under this Contract, shall be repaired at no cost to DCAMM.

1. An existing conditions survey shall be conducted, with the Engineer, the DCAMM Project Manager, and User Agency representatives, at which existing conditions will be videotaped by the Contractor. A copy of the videotape will be provided to the DCAMM Project Manager.

G. Trenching and other work outside construction limits shall be expedited to fullest extent and carried out with minimum of inconvenience to normal operation of the Operating Agency and public traffic. Walks, paved or landscaped areas over which temporary driveways cross, shall upon completion of the work, be restored to their original condition. Temporary roadways shall be bridged over trenched areas. Filing is required for a DCAMM issued trench permit.

H. The Contractor can gain access to the premises during the hours specified below. In addition the Contractor and his/her personnel will limit themselves only within the working premises during working hours. If work needs to be scheduled during times other than those listed below, Contractor shall inform the DCAMM Project Manager one week prior to work.

1. Deliveries and General Access: 7:00 am to 5:00 pm.

I. Confine operations at the site to areas permitted by:

1. Laws
2. Ordinances
3. Permits
4. Contract Documents
5. DCAMM and User Entity Regulations

6. DCAMM and User Entity Requirements

J. If required by User Agency or the DCAMM Project Manager, workers will be required to wear identifying name badges.

K. Contractor is responsible for correcting any site damage including but not limited to damage identified by the DCAMM Project Manager to the DCAMM Project Manager's satisfaction.

1. An existing conditions survey shall be conducted, with the Engineer, Tthe DCAMM Project Manager, and User Agency representatives, at which existing conditions will be videotaped by the Contractor. A copy of the videotape will be provided to the DCAMM Project Manager.

L. The Contractor shall verify that Subcontractors have visited the site and included all costs associated with the location of the project, and any restriction or limitations the location of the project may pose.

M. The Contractor, Subcontractors shall at all times conduct their operations in a courteous, professional manner while on the project or in the vicinity of the project. Sexual or other harassment, offensive language or behavior will not be permitted on the site.

1.10 COORDINATION

A. The Contractor shall be responsible for the proper coordination of the operations of all trades, Subcontractors or material and persons engaged upon the work. The Contractor shall do, or cause his/her agents to do, all cutting, fitting, adjusting, and repair necessary in order to make the several parts of the work come together properly.

1. Examine Contract Documents in advance of start of construction and identify in writing questions, irregularities or interference to the DCAMM Project manager in writing. Failure to identify and address such issues in advance becomes the sole responsibility of the Contractor.

B. Execute the work in an orderly and careful manner with due regard to the users of the facility, the Town of Medfield, the public, the employees, and the normal function of the facility.

C. The work sequence shall follow planning and schedule established by the Contractor as approved by the Engineer and the DCAMM Project Manager. The work upon the site of the project shall commence promptly and be executed with full simultaneous progress. Work operations which require the interruption of utilities, service, and access shall be scheduled so as to involve minimum disruption and inconvenience, and to be expedited so as to insure minimum duration of any periods of disruption or inconvenience.

D. The Contractor shall resolve any subcontractor conflicts that may exist without additional cost to DCAMM.

1.11 FIELD ENGINEERING

A. Provide field engineering services; establish grades, lines and levels, by use of recognized engineering survey practices. All field engineering surveying shall be performed by a licensed Land Surveyor registered in the Commonwealth of Massachusetts.

B. The Contractor shall survey and submit exact dimensional layouts as required. Engage and pay for the services of a Massachusetts Registered Surveyor acceptable to the DCAMM Project Manager to locate and protect control and reference points.

1.12 REFERENCE STANDARDS

A. For products specified by association or trade standards, comply with requirements for the standard, except where more rigid requirements are specified or are required by codes. Refer to Section 014200 - REFERENCES.

B. Where reference is made in the Contractual Documents to Publications and Standards issued by Associations or Societies, the intent shall be understood to specify the current edition of such Publications or Standards (including tentative revision) in effect on the date of the contract advertisement notwithstanding any reference to a particular date.

1.13 PRE-CONSTRUCTION CONFERENCE

A. In accordance with the Contract Documents, a pre-construction conference to review the work will be conducted by the DCAMM Project Manager prior to commencing construction on the site.

B. Representatives of the following shall be required to attend this conference:

1. DCAMM
2. Designer/Engineer
3. User Agency
4. Contractor
5. All Subcontractors
6. Applicable Municipal Agencies

C. The Contractor shall have a responsible representative at the pre-construction conference to be called by the DCAMM Project Manager following the award of the contract, as well as representatives of field or office forces and major Subcontractors. All such representatives shall have authority to act for their respective firms. The pre-construction conference is to be held within five days of Notice to Proceed, or as otherwise determined by DCAMM.

D. The pre-construction Conference will occur at the Project site. Review methods and procedures related to construction including, but not limited to, the following:

1. Inspect and discuss condition of construction.
2. Review and finalize schedule and verify availability of materials, personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review requirements of work performed by others.

4. Review requirements for potential change orders.
5. Discuss compensation and schedule of values.

1.14 PROJECT MEETINGS

A. Project meetings shall be held on a weekly basis and as required subject to the discretion of the DCAMM Project Manager.

B. As a prerequisite for monthly payments, ordering schedules, shop drawing submitted schedules, and coordination meeting schedules shall be prepared and maintained by the Contractor and shall be revised and updated on a monthly basis, and a copy shall be submitted to the DCAMM Project Manager and Engineer. DCAMM reserves the right to withhold payment if the Contractor fails to submit schedules in a timely manner.

C. In order to expedite construction progress on this project, the Contractor shall order all materials immediately after the approval of shop drawings and shall obtain a fixed date of delivery to the project site for all materials ordered which shall not impede or otherwise interfere with construction progress. The Contractor shall present a list and written proof of all materials and equipment ordered (through purchase orders). Such list shall be presented at the meetings and shall be continuously updated.

D. Scheduling shall be discussed with all concerned parties, and methods shall be presented by the Contractor, which shall reflect construction completion not being deferred or foreshortened. Identify critical long-lead items and other special scheduling requirements. The project schedule is to include time for submission of shop drawing submittals, time for review, and allowance for resubmittal and review.

E. Project meetings shall be chaired by the Engineer.

F. Minutes of the project meetings shall be prepared by the Engineer and shall be distributed to all present. The Engineer’s meeting minutes shall be the only official meeting record.

1.15 PERMITS, INSPECTION, AND TESTING REQUIRED BY GOVERNING AUTHORITIES

A. Prior to the start of work, and in a timely manner as required to complete the work on schedule, the Contractor shall complete application to, including but not limited to:

1. Notifications to the Massachusetts Department of Environmental Protection (MassDEP).
2. DCAMM for an excavation and trench permit in accordance with 520 CMR 14.00 Trench Safety Regulations.
3. Office trailer as described in Section 015000, TEMPORARY FACILITIES AND CONTROLS.

B. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having any jurisdiction require any portion of the Work to be inspected, tested, or approved, the Contractor shall give the Engineer, the DCAMM Project Manager or his/her designated representative, and such Authority timely notice (5 business days minimum) of its readiness so the Engineer may observe such inspecting, testing, or approval.

C. Unless otherwise specified under the Sections of the Specifications, the Contractor shall pay all fees required by public entities for the due and faithful performance of the work and which may arise incidental to the fulfilling of this Contract, including, but not limited to, fees associated with permits, inspections, and connections. As such, all fees, charges, and assessments in connection with the above shall be paid by the Contractor.

D. The Contractor shall maintain at the site, for the duration of construction operations, at least one (1) up-to-date copy of all relevant codes and standards listed in the Contract Documents or determined to be applicable to the work. One (1) copy of such codes shall be for the exclusive use of DCAMM and the Engineer and its Consultants, and shall be kept in the Contractor's site office.

E. The Contractor shall provide all information required by the building official(s) and shall secure the general building permit for the work promptly on award of the Contract. The Contractor shall conform to all conditions and requirements of the permit and code enforcement authority. The Contractor shall provide names and license numbers of its responsible representatives to complete the application for permit, and shall receive the permit and promptly distribute copies to DCAMM and the Engineer.

F. Contractor and specialized Subcontractors as applicable shall identify all permits (other than general building permit) required from Authorities having jurisdiction over the Project for the construction and occupancy of the work. The Contractor shall, working with specialized Subcontractors as applicable, prepare the necessary applications and submit required plans and documents to obtain such permits in a timely manner, and shall furnish the required information to the Building Official and obtain the required permits as early as practicable after award of the Contract.

1. The Contractor shall display all permit cards as required by the Authorities, and shall deliver legible photocopies of all permits to DCAMM's Project Manager and the Engineer promptly upon their receipt.
2. The Contractor shall arrange for all inspections, testing and approvals required for all permits, and shall notify the Engineer and DCAMM's Resident Engineer of such inspections at least three (3) business days in advance (longer if so required in the various Sections of the Specifications), so they may arrange to observe.
3. The Contractor shall comply with all conditions and provide all notices required by all permits.
4. The Contractor shall perform and/or arrange for and pay for all testing and inspections required by the Governing Codes and Authorities, other than those provided by DCAMM, and shall notify the Engineer and DCAMM's Resident Engineer of such inspections at least three (3) business days in advance of all such testing or inspection, so they may arrange to observe.
5. Where Inspecting Authorities require corrective work for conformance with applicable Codes and Authorities, the Contractor shall notify DCAMM and promptly comply with such requirements, except in cases where such requirements clearly exceed the requirements of the Contract Documents, in which case the Contractor shall proceed in accordance with the procedures for modifications or changes in the work established in the Contract Documents, as amended.

G. The Contractor shall make such tests and inspections of materials as may be required by State or municipal laws, and other applicable codes, or as called for under the various sections of the Specifications.

H. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any portion of the Work to be inspected, tested or approved, the Contractor shall give the Engineer and such Authority timely notice of its readiness so the Engineer may observe such inspection and testing.

I. All expenses attached to such tests and inspections, unless otherwise specified under the various sections of the Specifications, shall be borne by the Contractor, who shall furnish all labor, tools instruments, water, temporary power and light, construction, and equipment necessary for these tests and inspections. Records of all tests and inspections shall be furnished promptly to DCAMM and the Engineer. The Contractor shall remove all temporary work, materials and equipment upon completion of tests and inspections.

J. Should any material or work be found, after testing or inspection, to be defective or inferior, such materials and/or work, shall be removed and replaced with new sound materials and/or work, as directed by DCAMM. The removal and replacement herein called for shall be at the Contractor's expense.

K. Pay licensing fees, royalties, and other costs necessary for the use of any copyrighted or patented product, design, invention, or processing the performance of the job specified in this Section. Be solely responsible for costs, damages or losses resulting from any infringement of these patent rights or copyrights. Hold DCAMM and Engineer harmless from any costs, damages, and losses resulting from any infringement of these patent rights or copyrights. If the Specification requests the use of any product, design, invention, or process that requires a licensing fee or royalty fee for use in the performance of the job, pay the fee or royalty and disclose the existence of such rights.

1.16 CUTTING, CORING, AND PATCHING, UNLESS OTHERWISE INDICATED

A. The Contractor shall coordinate the work of the Subcontractors so as not to endanger any existing work by any cutting, coring, or excavating. No Subcontractor work shall endanger or alter the work of any other Subcontractor except with the written consent of the Engineer.

B. Utilities Services:

1. Interruptions to critical existing utility services is not permitted without prior notice and written approval by DCAMM and others as may be required by DCAMM. Any such notifications must be submitted to DCAMM no later than two (2) weeks prior to the proposed interruption.
    a. Sanitary sewer, storm drainage, and water changeovers as affecting existing services shall be done with no disruptions of existing services and scheduling of such work will require approval in writing by the User Agency.
    b. All relocation of existing electrical, telephone, and gas services that are utility company owned shall be performed by the respective utility company, and the cost of any charges for such work shall be paid by the Contractor. All utility

installations and relocation shall be the responsibility of the Contractor. Coordination of all of the aforesaid work is the responsibility of the Contractor.

2. The Contractor shall locate and record on Drawings all existing utilities along the course of the work by such means as the Engineer and the DCAMM Project Manager may approve, and shall preserve such marked locations until the work has progressed to the point where the encountered utility is fully exposed and protected as required. It shall be the Contractor's responsibility to notify the proper authorities and/or utility company before interfering with the existing utilities.
3. Existing utilities that are indicated on the Drawings or whose locations are made known to the Contractor prior to excavations, though accuracy and information as to grades and elevations may be lacking, shall be protected from damage during the excavation and backfilling operations and, if damaged by the Contractor, it shall be repaired by the Contractor at his/her own expense.
4. All exposed conduits, wires, and/or cables shall be provided with sufficient protection and support to prevent failure, fraying, or damage due to backfilling or other construction operations.
5. The Contractor shall not obstruct access to existing active utility system manholes and catch basins which continue to serve facilities other than the project construction site. The Contractor shall exercise measures as necessary to prevent the placement of impediments that limit continuous access by authorized utility company or User Agency maintenance personnel and shall be required to reimburse the utility company or User Agency for any expense incurred as a result of need to remove any such impediments to access.
6. In the event an active utility line is encountered, which is not indicated on the Drawings, immediately notify the utility company and DCAMM's representative of the exact location, size, and type of utility line encountered. Such utility line, if damaged, shall be immediately repaired, inspected by the utility company, protected, and maintained in use by the Contractor. If DCAMM determines that such lines be relocated, abandoned, cut, and capped, or otherwise altered, the Contractor shall consult the utility company and perform required work.
7. Contact information for the utility providers is as follows:

    a. Water and Sewer: Town of Medfield Director of Public Works, Maurice Goulet, 508-906-3003
    b. This contact is provided solely for the Contractor's convenience and are not guaranteed to be accurate at the time the Contractor attempts to contact them.

C. Dig-Safe:

1. Within the Commonwealth, "Dig-Safe" (Dig Safe Systems, Inc.) is the name of the Utility Underground Plant Damage Prevention Authority. Dig-Safe can be contacted via www.digsafe.com or by calling 1-888-DIGSAFE (344-7233) or dialing 811. Contractors must notify "Dig-Safe" of contemplated excavation, demolition, or explosive work in public or private ways, and any utility company right- of-way easement. Notification must be made at least seventy-two (72) hours prior to the work, but not more than sixty (60) days before the contemplated work.
2. The Owner requires that notification to "Dig-Safe" as required by their website with confirmation of such notification to the Engineer and the DCAMM Project Manager.

3. "Dig-Safe" is required to respond to the notice within seventy-two (72) hours from the time said notice is received by designating at the locus the location of pipes, mains, wires, or conduits.
4. Contractors shall not commence with work until "Dig-Safe" has responded as noted above.
5. Prior to the "Dig-Safe" notification, the Owner requires Contractors to provide their Superintendent with current "Dig-Safe" regulations, and a copy of Massachusetts General Laws, Chapter 82, Section 40

1.17 DEBRIS REMOVAL

A. The Contractor shall bear responsibility for maintaining the storage building access and the site clean and free of debris, leaving all work in clean and proper condition satisfactory to DCAMM and the Engineer. The Contractor shall ensure that each of the Subcontractors clean up during and immediately upon completion of their daily work. Clean up includes the following tasks:

1. Remove all rubbish, waste, tools, equipment, appurtenances caused by and used in the execution of work.
2. Clean up of surface in work area.

B. Prevent the accumulation of debris at the construction site, storage areas, parking areas, and along access roads and haul routes.

C. Provide containers for deposit of debris and schedule periodic collection and disposal of debris.

D. Prohibit overloading of trucks to prevent spillage on access and haul routes.

E. The Contractor shall be responsible for proper disposal of all construction debris leaving the site.

F. Debris shall be legally disposed of in a MassDEP approved disposal site. The site to be used shall be submitted to and approved by the DCAMM Project Manager prior to the start of construction. All required dumping permits shall be obtained prior to start of construction. Contractor shall submit receipts from the disposal site(s) as evidence of legal disposal. The responsible contractor shall pay the cost of any charges for debris removal.

1.18 FIELD MEASUREMENTS

A. Although care has been taken to ensure their accuracy, the dimensions shown for existing items and structures are not guaranteed. It is the responsibility of the Contractor to verify these dimensions in the field before fabricating any construction component. No claims for extra payment due to incorrect dimensions will be considered by DCAMM.

1.19 INTENT OF DOCUMENTS

A. The Contract Documents are intended to specify the requirements for the completion of the Work. Contractor shall complete the work in conformance with these Specifications using

Contractor-determined methodologies to achieve project goals unless otherwise prescribed herein. Work shall be completed in accordance with applicable laws, codes, ordinances, regulations, standards, or other applicable federal, state and municipal/local legal requirements.

B. The Drawings and Specifications are mutually complementary and what is called for in one shall be binding in both, and in no case shall the item noted only by one be omitted from the work.

C. The Drawings are intended to be diagrammatic and are not intended to be rigid in detail. Recommendations by the manufacturers of materials to be installed may be used by the Contractor subject to the approval of the Engineer, at no additional cost to DCAMM.

D. Material specified herein shall be furnished complete with all features normally provided with such items and any features or accessories required by the special conditions of work hereunder performed, whether or not specified or drawn in complete detail. Such equipment or material shall be subject to the approval of the Engineer and shall bear guarantees and certifications as specified herein or required by law, regardless of the manufacturer's standard practice.

E. All items not specifically mentioned in the Specifications or noted in the Drawings, but are normally required by trade practices to form part of the complete installation and/or recommended by manufacturers, shall be included.

1.20 WORK BY DCAMM

A. DCAMM will provide Site access.

B. DCAMM will provide a representative to sign material shipping records, Bills of Lading, and associated documents.

C. DCAMM will designate parking and staging areas.

1.21 WORK BY THE ENGINEER

A. The Engineer will interpret and clarify the Specifications, Drawings and Appendices. The Engineer may request written submittals of questions and request for clarification.

B. The Engineer will approve, as appropriate, all Contractor submittals for consistency with the Drawings, Specifications and attachments.

C. The Engineer will provide quality assurance testing, to verify Contractor testing.

D. The Engineer shall be responsible for air, dust, noise, and vibration monitoring.

1.22 PROTECTION OF EXISTING CONDITIONS

A. Take all proper precautions to protect adjoining property from damage or unnecessary interference and replace or put in good condition any existing items, which are damaged or injured in carrying out the work, unless designated to be demolished.

1.23 SUBCONTRACTORS

A. After selection and within 5 business days from the Notice to Proceed, the successful Bidder shall submit a list of Subcontractors proposed for the performance of the Work to DCAMM for approval. The list shall include the name, address, contact person, and Federal tax identification number for each Subcontractor.

B. DCAMM will approve Subcontractor and DCAMM's decision is final. Any additional cost associated with the Contractor selecting a secondary Subcontractor will be borne by the Contractor.

C. The Contractor shall not assign or subcontract any portion of the services required of it thereunder without the prior, written approval of DCAMM.

D. The Contractor shall make the necessary efforts to determine and confirm to DCAMM that all Subcontractors possess currently valid state and federal licenses, permits and certifications and that said Subcontractors are in full compliance with the requirements of said licenses, permits and certifications. Nothing in this contract shall create any contractual relationship or obligation between DCAMM and any Subcontractor.

1.24 SAFETY REGULATIONS

A. This project is subject to compliance with Public Law 91 596 "Occupational Safety and Health Act" latest edition (OSHA 29 CFR 1926), with respect to all rules and regulations pertaining to construction, including Volume 36, numbers 75 and 105, of the Federal Register, as amended, and as published by the U.S. Department of Labor and all other applicable laws.

B. Submit the name of the Contractor's safety officer to the DCAMM Project Manager. Submit copies of safety reports to the DCAMM Project Manager monthly.

C. All accident reports are to be transmitted to the Resident Engineer within 24 hours of occurrence.

D. The Contractor and all subcontractors who work on the project shall be made aware that hazardous or regulated material and wastes and special wastes exist at the Site that will require proper removal and disposal. The Contractor and Subcontractor shall be required to comply with all aspects of local, state, and federal regulations when performing removal and disposal of such materials. Specifically, all applicable OSHA, Mass DEP, and USEPA regulations shall be adhered to. Compliance with such applicable regulations, including all costs associated herein, is the sole responsibility of the Contractor. The management of miscellaneous hazardous or regulated materials shall include, but not limited to:

1. Characterization (any testing that may be required by a disposal facility), removal, and disposal of asbestos materials or potentially hazardous materials.
2. File all necessary notices, obtain all permits and licenses, and pay all governmental taxes, fees, and other costs in connection with the work. Obtain all necessary approvals of all governmental departments having jurisdiction.
3. Perform all sampling and testing required to properly profile the material for waste disposal. This shall also include all testing required by the disposal or recycling facility.
4. All costs for the testing shall be borne by the Contractor.
5. Comply with the Contractor's submitted Health and Safety Plan.

1.25 OSHA SAFETY AND HEALTH COURSE DOCUMENTATION

A. OSHA Safety and Health Course Documentation Records: M.G.L. 30 s 39S requires that everyone employed at the jobsite must complete a minimum 10-hour long course in construction safety and health approved by the U.S. Occupational Safety and Health Administration (OSHA) prior to working at the jobsite. Compliance is required of Contractors' and Subcontractors' on-site employees at all levels whether stationed in the trailer or working in the field.

B. Documentation records shall be initially compiled by the Contractor and Subcontractors as part of their certified payrolls, and the Contractor shall create and maintain a copy of the documentation on site at all times and the employer shall submit a copy with the certified payrolls to DCAMM's Compliance system. On-site documentation shall be filed in alphabetical order and immediately available to DCAMM's Project Manager and OSHA inspectors. Fines imposed for non-compliance shall be promptly paid by the Contractor at no additional expense to DCAMM. Delays in the progress of the Work caused by such non-compliance will not be acceptable as the basis for an extension of contract time or change order request.

1.26 DAMAGE RESPONSIBILITY

A. The Contractor shall repair, at no cost to DCAMM, any damage to building elements, site appurtenances, landscaping, utilities, etc. caused during demolition operation and work of this Contract.

1.27 ASBESTOS AND HAZARDOUS MATERIALS DISCOVERY

A. If unanticipated asbestos-containing materials or other Hazardous Materials not included in Contract are discovered at any time during the course of work, the Contractor shall cease work in the affected areas only and continue work in other areas, at the same time notify DCAMM and the Engineer of such discovery. Do not proceed with work in such affected areas until written instructions are received. If removal is required, payment will be made in accordance with the contract unit prices bid for each respective material. In the absence of unit prices, costs shall be negotiated or otherwise established prior to commencement of removal, in accordance with provisions of the Contract.

1.28 SPECIAL REQUIREMENTS

A. The Contractor shall prepare a Health and Safety Plan that addresses protection of employee and public health and safety. The minimum contents of the Plan are specified in Section 013800 – HEALTH AND SAFETY PLAN.

B. The Contractor shall be solely responsible for implementing the procedures specified in the Plan.

C. The Contractor shall make available complete sets of personal protective equipment and clothing to DCAMM for use during site observations/inspections by DCAMM and the Engineer. These shall be supplied and maintained at no cost to DCAMM and the Engineer, and shall be returned to the Contractor upon the completion of work, except for disposable protective clothing.

1. The Contractor shall provide a repository for collection and disposal of health and safety materials. Collection and disposal of contaminated disposable supplies shall be at no additional cost.

1.29 LIST OF DRAWINGS

A. The full list of drawings includes:

T1	Cover Sheet
G1-001	General Notes and Legend
C1-001	Existing Conditions Site Plan
C2-001	Soil Blending Site Plan
D1-001	Typical Construction Details

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 025000

SITE REMEDIATION

PART 1 – GENERAL

1.01 WORK INCLUDED:

A. Furnish all labor, materials, equipment, and incidentals necessary to remediate the Source Area via excavation, offsite disposal and soil blending as depicted in the Contract Documents. The Contractor shall perform the following:

1. Site preparation and clearing including placement of erosion controls;
2. Secure the excavation, stockpiling, and staging areas via chain-link fencing with locking gates. All fencing shall have dust barriers installed;;
3. Excavation and stockpiling of native unsaturated zone soils (up to approximately 12 feet below existing grade pending seasonal groundwater elevation);
4. Preparation and application via soil blending of a 3% mix of zero valent iron (ZVI) to stockpiled unsaturated zone soils;
5. Excavation of native saturated zone tetrachloroethylene (PCE) impacted soils at depths from up to approximately 10 feet to approximately up to 22 feet below grade;
6. Dewatering and treatment, in accordance with Section 026000 – DRAINAGE CONTAINMENT AND DEWATERING.
7. Placement of temporary monitoring wells within excavation area and off-Site laboratory analysis of groundwater samples as specified in Item 3.05.
8. Soil disposal characterization, handling, transportation and disposal of saturated zone soils at a licensed disposal or recycling facility;
9. Treatment of the tight-till interface at the bottom of excavation via soil blending the top 12 inches with a 5% ZVI mix or placement and compaction of one 12 inch lift of unsaturated zone soil treated with a 5% ZVI mix on the bottom of the excavation. If the Contractor elects to treat the till interface via soil blending, the Contractor shall verify the treated till interface areas at the bottom of the excavation overlap and treatment is complete;
10. Construction of a permeable reactive barrier (PRB) wall comprised of a high dose of granular ZVI at and beyond the west extent of the excavation as shown on the Contract Drawings and constructed concurrent to the backfill of cells;
11. Backfill and compaction of the saturated zone with ZVI-treated unsaturated zone soils.
12. Placement and compaction of imported clean fill in unsaturated zone to restore the site to existing grades;
13. Surface restoration, planting, site cleanup of all debris, and removal of materials, and equipment
14. Contractor daily logging and reporting to Engineer of treatment information including but not limited to, pounds of ZVI applied, treatment areas with GPS horizontal information and vertical elevation survey data; and
15. Confirmatory testing of percentage of ZVI.

1.02 RELATED WORK:

A. Section 011419 – DUST CONTROL

B. Section 011500 – SPECIAL CONDITIONS

C. Section 013800 – HEALTH AND SAFETY PLAN

D. Section 023000 – SUBSURFACE INVESTIGATION

E. Section 023500 – UTILITY ABANDONMENT

F. Section 026000 – DRAINAGE CONTAINMENT AND DEWATERING

G. Section 026113 – EXCAVATION AND STOCKPILING OF IMPACTED MATERIAL

H. Section 026116 – TRANSPORTATION AND DISPOSAL OF IMPACTED MATERIAL

I. Section 027400 – MONITORING WELL AND INJECTION POINT DECOMMISSIONING, REMOVAL, AND PROTECTION

J. Section 312000 – EARTH MOVING

K. Section 312500 – EROSION AND SEDIMENTATION CONTROLS

1.03 SUBMITTALS:

A. Submit to the Engineer, for review, and in accordance with the requirements of the general specifications, the information required by Paragraph 1.03.B of this Section, no more than 30 days after issuance of the Notice to Proceed.

B. Contractor shall submit a Remediation Work Plan describing remedial activities and work procedures including the following:

1. The Contractor shall identify subconsultants and ZVI manufacturer and provide the following information:

a. General Information:

i. Remediation Vendor/Manufacturer Name
ii. Remediation Vendor/Manufacturer Address
iii. Name of Contact Person(s)
iv. Title of Contact Person(s)
v. Telephone Number(s) of Contact Person(s)

2. The Contractor shall develop procedures to remediate the approximately 5,500 square-foot area identified as the Source Area Remediation Area specified herein and

shown on Sheet C2-001 of the Contract Drawings. The Contractor shall provide the following information in the Remediation Work Plan:

a. ZVI manufacturer's recommendations for application and dosing.
b. Method to excavate, stockpile and treat unsaturated soils to approximately 8 to 10-feet below the existing ground surface with a 3% ZVI mix.
c. Method of excavating, handling, transporting, and disposing of saturated zone PCE-impacted soils from up to approximately 10-feet to up to approximately 22-feet below the grade surface.
d. Method of soil blending the tight-till interface and equipment to be used. If the Contractor determines soil blending the till interface is not feasible, provide a plan to place and compact one 12-inch lift of soil treated with a 5% ZVI mix at the till interface. Provide manufacturer cut sheets on equipment proposed for use.
e. Health and safety requirements when handling ZVI materials and impacted soils.
f. Contractor measures to protect the public and restrict access to the work area including but not limited to construction fencing and signage.
g. Matching the percentage specified within the Contract Documents, pounds and concentration of ZVI to be applied to stockpiled unsaturated zone soil and the tight-till interface at the bottom of excavation.
h. Method to install a PRB wall at the west extent of the excavation.
i. Proposed daily reports including:
    i. Logs of ZVI dosing in pounds;
    ii. Notes of excavation and soil blending noting any limitations and deviations from the Remediation Work Plan;
    iii. AutoCAD geo-referenced extents of daily excavation/treatment cell with GPS horizontal limits and vertical elevation data tied to existing benchmarks.
j. Shop drawings and schematic diagrams showing plans for excavation, ex-situ soil blending, and backfilling. Include the following:
    i. Provide schematic diagrams showing the layout of excavation cells. Each cell shall be completed at the end of each day such that no open excavations remain overnight. Excavation and include vertical and horizontal control and Contractor measures to track and record vertical elevation and horizontal locations.
    ii. Provide a plan detailing the sequence of excavation of saturated zone soil cells, treatment of the till interface, and backfilling cells with ZVI-treated unsaturated zone soils.
    iii. Include proposed tracking/naming system for excavation cells. Tracking/naming must correspond to tabulated daily data provided by Contractor and Contractor shall match and provide these locations on as-built drawings with horizontal and vertical limits.
    iv. Provide design calculations showing calculated application rates and pounds of ZVI mixtures to be applied.
    v. Shop drawings shall include Manufacturer's data sheets showing performance characteristics and other pertinent information.
k. The remedial contractor shall submit proof of successful operating project experience during the last five (5) years on a minimum of five (5) soil blending

pilot studies or full-scale soil blending remediation projects of remedial additives/chemicals and equipment comparable to that specified

3. A Manufacturer's Representative, or approved Contractor Specialist, shall be required to be on-Site to monitor and evaluate ZVI application and blending for the duration of the remediation work.

4. The Contractor shall include a decontamination plan in the Remediation Work Plan. Refer to Section 013800 - HEALTH AND SAFETY PLAN for additional information.

5. Contractor shall be responsible for clean-up/repair of any damaged utilities/structures or foundations that are the result of soil excavation and shall appropriately clean-up released/spilled chemicals at no additional cost to the Owner in accordance with Section 023500 - UTILITY ABANDONMENT.

6. Records shall be kept accurately and neatly on approved printed forms, which shall be supplied by the Contractor.

C. Furnish written certification by the Manufacturer's Representative or Authorized Contractor Representative verifying proper handling, preparation, and application of ZVI as specified herein and in accordance with the recommendations of the Manufacturer's Representative.

1.04 QUALITY ASSURANCE:

A. A single manufacturer shall furnish all ZVI materials specified under this Section. These products shall be from manufacturers regularly engaged in the production of said chemicals/remedial additives. The Contractor / Remediation Vendor / Manufacturer's Representative shall have the responsibility for proper handling, preparation, and application of the remedial additives.

B. Any reference to a specific manufacturer or chemical is for the purpose of establishing a quality or parameter for specification writing and is not to be considered proprietary. In all cases, any chemical that has the quality and capabilities specified may be accepted.

C. The remedial contractor shall submit proof of successful operating project experience during the last five (5) years on a minimum of five (5) soil blending pilot studies or full-scale soil blending remediation projects of remedial additives/chemicals and equipment comparable to that specified.

D. The manufacturer shall provide on-Site field support services as needed of a Manufacturer's Representative, who is specifically trained on the handling and application of their products and on the application equipment to properly apply chemicals. The Contractor shall support the Engineer's monitoring of the groundwater parameters identified in Paragraph 1.03 of this Section.

1.05 EXISTING CONDITIONS

A. Work under this Project will occur within the disposal site boundary associated with Department of Environmental Protection (DEP) Release Tracking No. (RTN) 2-3020799. Elevated concentrations of Volatile Organic Compounds (VOCs), specifically PCE, have been detected at this Site in soil and groundwater. Subsurface data is included in Section 023000 – SUBSURFACE INVESTIGATION.

PART 2 – PRODUCTS

2.01 GENERAL:

A. At the expense of the Contractor, all Contractor personnel including the Remediation Vendor and Manufacturer's Representative, shall wear personal protective equipment and protective clothing consistent with the levels of protection required for this work as indicated in the Site-specific Health and Safety Plan in accordance with Section 013800.

B. Supply all necessary excavation and soil blending equipment, pumps, piping, gauges, water, and other materials/equipment required. **Soil blending may not be performed by standard excavator bucket teeth which will not provide sufficient contact**. The Contractor shall utilize multi-axis soil blending excavator attachments/tools or Engineer-approved soil blending equipment to thoroughly mix soils and ZVI and ensure full contact between soil and ZVI.

2.02 ZVI MATERIALS AND ACCEPTABLE MANUFACTURERS:

A. The Contractor shall provide sufficient ZVI for the blending of unsaturated zone soils, treatment of the till interface, and construction of the PRB wall, as specified herein. The Contractor shall provide both powdered and granular ZVI products or approved equal, as specified herein:

a) Ferox Flow, a powdered ZVI material as manufactured by Hepure of Hillsborough, New Jersey, or approved equal.

b) Ferox PRB, a granular ZVI material as manufactured by Hepure of Hillsborough, New Jersey, or approved equal.

B. Contractor shall blend a 3% ZVI mixture into stockpiled unsaturated zone soils consisting of 2% granular (Ferox PRB or approved equal) and 1% powdered (Ferox Flow or approved equal). The tight-till interface shall be treated with a 5% ZVI mixture consisting of 3% granular and 2% powdered ZVI or soil treated with the same 5% ZVI mixture. The PRB wall shall consist of a 20-30% dose of granular ZVI. Exact ZVI mixture concentrations are subject to change based upon the Manufacturer's Representative's recommendations.

C. Equivalent ZVI material and quantity to be approved by the Engineer.

PART 3 – EXECUTION

3.01 GENERAL

A. Notify Engineer at least two (2) days prior to sampling, excavation, soil blending, or any other remediation-related Site work.

B. Sampling/monitoring shall be conducted only with Engineer's approval and in the presence of the Engineer

3.02 EXCAVATION AND STOCKPILING

A. Excavation work, including any support of excavation including sheeting, temporary bracing and temporary supports that may be required to ensure the integrity of the excavation, shall be conducted in accordance with Section 312000 – EARTH MOVING.

B. Unsaturated zone soils shall be excavated from surface grade to up to 12 feet below ground surface pending seasonal groundwater elevation. These soils shall be stockpiled and covered with 20-mil (minimum) polyethylene sheeting.

C. Saturated zone soils shall be excavated from approximately up to 10 feet to approximately up to 22 feet below grade and either live loaded into trucks for offsite disposal or temporarily stockpiled on and covered by polyethylene sheeting in accordance with Section 026113 – EXCAVATION AND STOCKPILING OF IMPACTED MATERIAL. The Contractor shall collect leachate from the stockpiled material and treat in the on-Site dewatering system per Section 026000 – DRAINAGE CONTAINMENT AND DEWATERING.

3.03 SOIL BLENDING:

A. Soil blending of unsaturated zone soils shall be conducted once the soil has been excavated and stockpiled. Unsaturated zone soil shall be blended with a 3% ZVI mixture consisting of 2% granular and 1% powdered ZVI.

B. The tight-till interface at the bottom of the excavation, approximately 22 feet below grade, shall be treated using one of the following two options:

1. The soil blending excavator and attachment shall apply a 5% ZVI mixture consisting of 3% granular and 2% powdered ZVI to a minimum depth of 1 foot below the till interface (approximately 23 feet below grade) across the bottom of the excavation; or

2. An excavator shall place and compact one 12-inch lift of ZVI-treated soil across the bottom of the excavation. The soil shall be unsaturated zone soil blended with a 5% ZVI mixture consisting of 3% granular and 2% powdered ZVI.

3.04 DUST CONTROL:

A. The work area will be monitored for dust per Section 011419 – DUST CONTROL. In the event that remediation activities generate excessive quantities of dust, the Contractor

shall employ dust control measures to minimize the creation of airborne dust during the entire work per Section 011419 – DUST CONTROL.

END OF SECTION

SECTION 026000

DRAINAGE CONTAINMENT AND DEWATERING

PART 1 - GENERAL

1.01 CONTRACT REFERENCES

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of Specifications.

B. Equality of material, article, assembly, or system other than those named or described in this Section shall be determined in accordance with the provisions of Article V, Paragraph 1 of the CONTRACT AND GENERAL CONDITIONS.

1.02 DESCRIPTION OF WORK

A. The Contractor shall furnish, install, operate, monitor, and maintain dewatering and drainage systems as necessary to lower and maintain water levels, treat dewatering fluids prior to on-Site infiltration, and hydrostatic pressures to allow work to be done in the dry. Groundwater is located approximately 8 to 12 feet below existing grade.

B. The dewatering system shall be capable of lowering the groundwater levels to a minimum of 2 feet below excavation bottom to provide a dry and stable subgrade until remediation work is completed and backfill materials are placed and compacted.

C. Temporary berming, shoring, sumps, pumps or other approved means of controlling water levels shall not be installed beyond the extent of proposed excavation.

D. Obtain and pay for all permits required for temporary dewatering and drainage systems.

E. The Contractor shall collect, treat, and properly reinfiltrate all discharge water from dewatering and drainage systems within the Source Area Remediation Area in accordance with applicable local, state, and federal requirements and permits.

F. Drainage of all water resulting from pumping by the Contractor shall be managed so as not to cause damage to adjacent areas and/or utilities. Repair damage caused by dewatering and drainage system operations to adjacent areas and/or utilities as directed by DCAMM or the Engineer.

G. The Contractor shall remove temporary dewatering and drainage systems when no longer needed and restore all disturbed areas.

1.03 RELATED SECTIONS

A. Section 025000 – SITE REMEDIATION

B. Section 026116 – TRANSPORTATION AND DISPOSAL OF IMPACTED MATERIAL

C. Section 312000 – EARTH MOVING

1.04 SUBMITTALS

A. The Contractor shall submit each item in this Article according to the Conditions of the Contract and Section 013300 – SUBMITTAL REQUIREMENTS, for information only, unless otherwise indicated.

B. The Contractor shall submit six copies of a Dewatering Treatment Plan indicating how they intend to collect, treat, and recharge groundwater and control the discharge from any dewatering operations on the project. The Contractor shall use the subsurface geologic data provided in Section 023000 – Subsurface Investigation to estimate groundwater flows coincident with their support of excavation/excavation phasing plans per Section 026113 – Excavation and Stockpiling of Impacted Material to maintain dry/stable excavation conditions to two feet below the anticipated final excavation depth. The Contractor shall remain responsible for adequacy and safety of construction means, methods and techniques as well as regulatory approvals that may be required for discharge. The plan shall also include the following:

1. Location of the treatment system and the system discharge.
2. Process flow diagram and layout.
3. Identity, capacity, details, and manufacturer's specifications for each component of the system.
4. Sizing and type of GAC treatment media.

1.05 DEFINITIONS

A. Where the phrase "in-the-dry" is used in these specifications, it shall be defined as the absence of standing water in the work area.

PART 2 - PRODUCTS

2.01 SYSTEM REQUIREMENTS

A. The temporary treatment system shall be capable of handling flows generated by project remedial activities.

2.02 SYSTEM COMPONENTS

A. The treatment system shall consist of the following elements at a minimum:

1. Equalization tank: tank shall be used to receive water, shall be mobile, and the tank shall have a minimum capacity of 20,000 gallons or greater. The tank shall be constructed of steel.
2. Bag filters: Two bag filter systems with a minimum flowrate of 50 gpm, with 10-micron filters (or sizing recommended by GAC supplier), from Global Remediation, Rosedale, Rain-for-Rent or approved equal.

3. Associated transfer pumps, flow meters and controls rated for projected flows: Pumps employed shall be explosion proof and non-emulsion type where applicable and shall comply with applicable safety codes.

4. Equipment, Piping, Valves: All equipment, piping, valves, and other system components used shall be resistant to corrosion or decay from contact with waters generated by remedial activities.

5. Carbon adsorption units: Granular activated carbon (GAC) adsorption units for treatment of organic constituents shall be used to treat dewatering fluids. A minimum of two GAC vessels (one lead and one lag) shall be provided each with at least 1,000 pounds of virgin coconut carbon from a reputable carbon vendor such as Calgon, Carbtrol, Tigg, or approved equal. GAC unit shall be sufficiently sized to handle anticipated flow and shall be equipped with access ports to allow for immediate access to spent GAC for changeouts.

6. Sampling ports: Sampling ports shall be provided in the influent and discharge piping from the sedimentation tank and treatment system and at other locations indicated in the system schematic. The ports shall be readily accessible and capable of controlling the flow from 0.1 liters per minute to 1 liter per minute.

7. The above system shall be designed for anticipated flow rates, be skid-mounted, or trailer mounted, mobile and require minimum space and operation and maintenance.

8. Solids collected in the treatment process units shall be dewatered and disposed of in accordance with Section 026116 – TRANSPORTATION AND DISPOSAL OF IMPACTED MATERIAL.

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor shall control groundwater such that excavation is performed in-the-dry and bearing soils are maintained undisturbed.

B. The treatment system shall be installed in accordance with the manufacturer’s written instructions.

3.02 OPERATION AND MAINTENANCE

A. The treatment system shall be operated continuously during project dewatering activities.

B. All water to be treated in this system shall be recharged on site hydrologically upgradient of the area from which the water was collected, except at the start of work when ZVI treated soils are not present. At the start of the project, treated dewatering fluids should be recharged cross-or down-gradient of the work area with protections to avoid scouring; any scouring/erosion will be repaired by the Contractor at no additional cost to the Owner. After ZVI-treated cells are in place, treated dewatering fluids shall be recharged upgradient of the ZVI area.

C. The Contractor shall monitor GAC units and replace GAC as necessary to ensure optimal performance of the system. Monitoring shall include treatment system sampling as detailed in Item 3.03 of this section.

3.03 TREATMENT SYSTEM MONITORING

A. Contractor will collect samples from GAC influent, midpoint and effluent locations for laboratory testing for cVOCs via EPA Method 8260B. Sampling shall include initial pre-infiltration sampling to confirm that treatment objectives are achieved (MCP GW-2 parameters). Assume three (3) sample sets (influent, midpoint, and effluent) for the assumed active project dewatering period including ten sampling events for a total of 30 samples. Contractor will collect and deliver samples with all appropriate handling procedures to a NELAC accredited laboratory for 24-hr turnaround time. Data will be forwarded directly from the lab to the Contractor and Engineer.

At a minimum, the Contractor shall achieve MCP standards for dewatering system treatment the following cVOCs:

Compound	Dewatering Fluid Treatment Objective (µg/L)	Source: MCP Standard
cis-1,2-Dichloroethylene	20	GW-2
Tetrachloroethylene	5	GW-1
Trichloroethylene	5	GW-1 & GW-2
Vinyl Chloride	2	GW-1 & GW-2

* µg/L = micrograms per liter

Any treated dewatering fluids that exceed MCP GW-1 standard shall be retreated prior to discharge and treatment media replaced at no additional cost to the Owner to obtain performance standards.

3.04 SYSTEM REMOVAL

A. At completion of work, the Contractor shall clean tanks of water, sediment and spent GAC drums and properly transport and dispose off-Site. Contractor shall collect all required waste profiling samples for transportation and disposal of the used liquid-phase GAC and drummed sediment and rinsate water. The Contractor shall prepare and provide required waste disposal documentation for Engineer review.

B. All elements of the groundwater treatment system shall be removed from the Site at the completion of work.

3.05 WATER CONTROL

A. The Contractor shall control water runoff to prevent flow into excavations. Provide temporary measures such as dikes, ditches and sumps, as needed.

END OF SECTION

SECTION 026113

EXCAVATION AND STOCKPILING OF IMPACTED MATERIAL

PART 1 – GENERAL

1.01 DESCRIPTION:

A. Furnish all labor, materials, equipment, and incidentals necessary to properly excavate, handle, stockpile and otherwise manage, remove, and/or segregate excavated materials for on-site treatment/re-use or off-site disposal/recycling. The Contractor shall be responsible for all analytical testing of surplus soils for disposal characterization purposes, as required by the disposal/recycling facility(ies) and the Engineer.

B. The Contractor shall excavate materials within the limit of work, as required by the Engineer. All excavated soil shall be stockpiled on and securely covered with 20 mil polyethylene while awaiting disposal characterization results.

1.02 RELATED WORK:

A. Section 013800 – HEALTH AND SAFETY PLAN

B. Section 011419 – DUST CONTROL

C. Section 013543 – ENVIRONMENTAL PROTECTION PROCEDURES

D. Section 025000 – SITE REMEDIATION

E. Section 026000 – DRAINAGE CONTAINMENT AND DEWATERING

F. Section 026116 – TRANSPORTATION AND DISPOSAL OF IMPACTED MATERIAL

G. Section 312000 – EARTH MOVING

H. Section 312500 – EROSION AND SEDIMENTATION CONTROLS

1.03 SUBMITTALS:

A. Laboratory results for all samples collected and/or analyzed by the Contractor shall be submitted to the Engineer within 2 days of receipt. The results shall include all Chain-of-Custody forms and all documentation provided by the laboratory.

1.04 REFERENCES:

A. Massachusetts Department of Environmental Protection (DEP) Policy Number:

1. WSC-13-500, Similar Soils Provision Guidance.

2. COMM-97-001, Reuse and Disposal of Contaminated Soils at Massachusetts Landfills.

B. Massachusetts Contingency Plan (MCP), 310 CMR 40.0000.

C. Toxic Substances Control Act (TSCA), 40 CFR 761.00.

D. 310 CMR 30.0000 and the Resource Conservation and Recovery Act (RCRA), 40 CFR 148 and 268.

E. All other applicable federal, state, and local regulations.

1.05 DEFINITIONS:

A. Saturated zone soil: Soil assumed to be impacted with chlorinated volatile organic compounds (cVOCs) and located below the groundwater table at approximately 8 to 10 feet below ground surface.

B. Unsaturated zone soil: Soil located above the groundwater table from surface grade to approximately 8 to 12 feet below ground surface.

C. Excavated Material: All excavated materials.

1.06 QUALITY CONTROL:

A. The work shall conform to applicable local, state and federal regulatory agencies governing the handling of soils and hazardous materials.

B. Best Management Practices shall take place while performing the work described in this Section.

PART 2 – PRODUCTS

2.01 GENERAL:

A. At the expense of the Contractor, all personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection required for this work as indicated in the site-specific Health and Safety Plan and in accordance with Section 013800– HEALTH AND SAFETY PLAN.

B. Containers used for hauling the saturated zone soil shall be constructed of steel, in good condition and designed for the intended purpose of safe, secure storage of excavated material during loading and transport to an approved disposal facility. The containers must be containers approved by and labeled in accordance with the U.S. Department of Transportation (DOT).

C. The containers shall be sift proof and water resistant in accordance with the U.S. DOT regulations.

2.02 FILL MATERIALS:

A. The imported backfill material for the unsaturated zone shall meet the requirements specified in Section 312000 – EARTH MOVING and be certified clean. Backfill from non-virgin or certified clean sources will be rejected and replaced at no additional cost to the DCAMM.

B. The backfill material for the saturated zone shall be unsaturated zone materials that have been treated and meet the requirements of Section 025000 – SITE REMEDIATION.

C. Notify the Engineer as to the source of the imported backfill material. Provide samples as requested by the Engineer.

PART 3 – EXECUTION

3.01 GENERAL:

A. The Contractor shall excavate, handle and manage excavated materials to perform site work described in this Contract.

C. The Contractor shall segregate excavated unsaturated zone soils to be stockpiled and treated in accordance with Section 025000 – SITE REMEDIATION. The Contractor shall segregate saturated zone soils for offsite disposal. The treated excavated materials shall be placed as backfill in the saturated zone.

D. Prior to excavating any soil, erosion and sediment control measures shall be implemented per Section 312500 – EROSION AND SEDIMENTATION CONTROLS. Also, the excavation area planned for removal shall be moistened with water prior to excavating to control potential dust generation. Additional dust control measures may be required throughout the course of the project in accordance with Section 011419 – DUST CONTROL

3.02 EXCAVATION AND STOCKPILING OF IMPACTED MATERIAL:

A. Soil excavated from the Source Area Remediation Area shall be live loaded or placed on and under sheeting as prescribed in Section 3.04. The Contractor shall excavate and relocate these materials to temporary stockpile locations. Soil excavated from the unsaturated zone (approximately 8 to 10 feet below grade) shall be stockpiled separately from soil excavated from the saturated zone (approximately 8 to 10 feet to 22 feet below grade).

B. Contractor shall backfill excavated areas to match existing grades with specified backfill, in accordance with Section 312000 – EARTH MOVING.

3.03 CHARACTERIZATION:

A. The Contractor shall be responsible for characterizing the saturated zone soil for the purpose of obtaining approvals from the disposal facility(ies).

1. The Contractor shall perform all requested lab analyses of saturated zone soil as required by the receiving facility. Characterization sampling may include but is not limited to the following:

Analytical Parameter	EPA Approved Test Method
Total Petroleum Hydrocarbons (TPH)	Method 8100
Volatile Organic Compounds (VOCs)	Method 8260B
Semi-volatile Organic Compounds (SVOCs)	Method 8270D
Polychlorinated Biphenyls (PCBs)	Method 8082A
Compendium of Analytical Methods (CAM) 14 Metals	Method 6010 & 7470
With Engineer Approval - Toxicity characteristic leaching procedure (TCLP)	Method 6010D 1311
Herbicides*	Method 8081B
Pesticides*	Method 8151A
Ignitability	Method 1030
Conductivity	Method 2510B
Reactive Cyanide	Method 9014
Reactive Sulfide	Method 9030A
pH	9045D

*with approval of the Engineer only

2. The Contractor will be permitted to collect additional samples to perform additional testing of the saturated zone soil as required by the facility at no additional cost to the DCAMM and only with the approval of the DCAMM and Engineer.

3. The Contractor shall notify the Engineer at least two (2) days prior to any material sampling and the Engineer must be present for all sampling activities by the Contractor. All sample collection must be approved by the DCAMM and or Engineer in writing, prior to sample collection. Samples rejected for analysis by the DCAMM or Engineer shall be disposed of at no additional cost to the DCAMM.

3.04 STORAGE OF EXCAVATED MATERIAL:

A. The Contractor shall be allowed to stockpile excavated material in the staging areas indicated on the Drawings if the following conditions are met:

1. Any stockpiled excavated material shall be placed on 20-mil (minimum) polyethylene sheeting and covered with 20-mil (minimum) polyethylene sheeting or 10-mil nylon sheeting.

2. The polyethylene sheeting shall be bermed around the edges to prevent any infiltration of stormwater or exfiltration of leachate.

3. The base of the temporary stockpile shall be sloped to create leachate collection points. Collect and dispose of all leachate generated from the stockpiles. Collect and appropriately dispose of all leachate generated from the stockpiles in accordance with Section 026000 – DRAINAGE CONTAINMENT AND DEWATERING.

4. Stockpiled saturated zone material must be removed off-site as soon as possible and in all cases within 90 days from the day of its initial excavation. All soil removed from the site must not contain free-liquid and pass a paint filter test in accordance with the receiving facility acceptance criteria.

B. If any one of these conditions cannot be met, then the Contractor shall store impacted material in water-tight containers at no additional cost to the DCAMM pending transportation and disposal. The containers must be removed off site within 90 days from the first day of excavation/generation.

END OF SECTION

SECTION 026116

TRANSPORTATION AND DISPOSAL OF IMPACTED MATERIAL

PART 1 – GENERAL

1.01 DESCRIPTION:

A. The intended purpose of the Section is to address the transport and disposal of excavated material that will be generated during the course of the Work as shown on the Contract Drawings.

B. Furnish all labor, materials, equipment, and incidentals necessary to transport and dispose of excavated materials encountered in the saturated zone of the Source Area Remediation Area at approximately 8 to 10 feet below grade and to 20 to 22 feet below grade. Work includes preparing disposal documentation including Bills of Lading as required, obtaining approval from disposal facilities for disposal, and loading and hauling of excavated materials.

C. Excavated materials not approved by DCAMM for backfilling because of physical or chemical characteristics shall be disposed of as specified herein.

D. The Contractor will be responsible for the cost of analytical testing of all disposal characterization samples. The Contractor is responsible for the waste profiling requirements, collection and submittal of any disposal characterization samples, and provisions or any other information to obtain approval from the receiving facility.

1.02 RELATED WORK:

A. Section 013800 – HEALTH AND SAFETY PLAN

B. Section 013543 – ENVIRONMENTAL PROTECTION PROCEDURES

C. Section 026113 – EXCAVATION AND STOCKPILING OF IMPACTED MATERIAL

D. Section 312000 – EARTH MOVING

1.03 SUBMITTALS:

A. Submit to the Engineer, for review, and in accordance with the requirements of the general specifications, the information required by Paragraph 1.03 B., no more than 14 days after issuance of the Notice to Proceed:

B. The Contractor shall prepare an Excavation Materials Management Plan (EMMP) including the following information:

1. Procedures/sequence of activities related to soil excavation, representative soil disposal characterization sampling and testing as approved by the Engineer, transport and disposal.

2. All pertinent information relating to the transport of saturated zone soil. The information, at a minimum, shall include:

   a. Name and address of all transporters.

   b. Transporter identification number (USEPA or Massachusetts Department of Transportation Transporter) and expiration date.

   c. Proof of permit, license, or authorization to transport the saturated zone soil in all affected states.

   d. Details of containers to be used for transporting saturated zone soil. Refer to Paragraph 2.01 B. of this Section.

3. The Contractor shall identify each waste stream and propose an appropriate disposal facility that will accept the material. A minimum of three (3) receiving facilities shall be proposed including a minimum of two (2) receiving facilities for disposal and one (1) receiving facility for the recycling.

   The Contractor shall submit to the Engineer, approvals or letters of intent and facility information for each facility proposed, within 14 days of issuance of the Notice to Proceed. For each facility, the Contractor shall submit the following information:

   a. General Information

      i. Facility Name
      ii. Facility Address
      iii. Name of Contract Person
      iv. Title of Contact Person
      v. Telephone Number of Contact Person
      vi. Permit Number
      vii. Acceptance Criteria of receiving facility including any applicable regulatory standards and/or contaminant-specific limits.

   b. The facility shall specify the volume of material that can be accepted from the site on a weekly and a total basis.

   c. The facility shall provide written confirmation that they are permitted to accept and will accept the classified material of the general quality and quantity described by these Specifications.

d. The facility shall provide a listing of all current and valid permits, licenses, letters of approval, and other authorizations to operate that they hold, pertaining to the receipt and management of the soils or materials specified in this contract.

e. The Contractor shall submit a complete list of the disposal facility's permitted allowable contaminant levels and physical characteristic requirements for impacted material, and list any required regulatory approvals for individual waste streams.

4. Proof of emergency service agreement with certified emergency response contractor.

5. Record keeping information as described in 3.08.

1.04 REFERENCES:

The Contractor shall comply with all federal, state, and local regulations, including at a minimum the following regulations:

A. Massachusetts Department of Environmental Protection (DEP) Policy Number:

1. WSC-13-500, Similar Soils Provision Guidance.

2. COMM-97-001, Reuse and Disposal of Contaminated Soils at Massachusetts Landfills.

B. Massachusetts Contingency Plan (MCP), 310 CMR 40.0000.

C. Toxic Substances Control Act (TSCA), 40 CFR 761.00.

E. 310 CMR 30.0000 and the Resource Conservation Recovery Act (RCRA), 40 CFR 148 and 268.

F. All other applicable federal, state, and local regulations.

1.05 DEFINITIONS:

A. Please refer to Section 026113 – EXCAVATION AND STOCKPILING OF IMPACTED MATERIAL Item 1.05 for definitions.

1.06 PERMIT REQUIREMENTS:

A. The Contractor shall obtain all Federal, State, and local permits required for the transport and disposal of saturated zone soil. The Contractor shall adhere to all permit requirements.

B. The Contractor shall document that the disposal facilities proposed have all certifications and permits as required by Federal, State, and local regulatory agencies to receive and dispose of the saturated zone soil.

PART 2 – PRODUCTS

2.01 GENERAL:

A. All Contractor personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection for this Work as indicated in Section 013800 – HEALTH AND SAFETY PLAN.

B. Containers used for hauling the saturated zone soil shall be constructed of steel, in good condition and designed for the intended purpose of safe, secure storage of hazardous material during loading and transport to an approved facility. The containers shall have a secure cover which will prevent a release of material from truck during transportation. The container and covers shall be approved by the Engineer prior to mobilization of trucks/containers. The containers must be approved by and labeled in accordance with the U.S Department of Transportation (DOT). The containers shall be sift proof and water resistant in accordance with the DOT regulations.

2.02 EQUIPMENT AND VEHICLE DECONTAMINATION:

A. The Contractor shall provide an equipment and vehicle decontamination station as required in Section 013800 – HEALTH AND SAFETY PLAN.

PART 3 – EXECUTION

3.01 GENERAL:

A. DCAMM will be the generator and will sign all manifests and DEP shipping documents. Except for hazardous waste materials that shall be transported under a Hazardous Waste Manifest, non-hazardous soils with concentrations greater than MCP reportable concentrations shall be transported under a Bill of Lading. The Contractor shall prepare all disposal documentation including Bills of Lading and shall submit all transportation paperwork, as required in the EMMP, to the Engineer for approval prior to shipment. DCAMM and DCAMM's LSP (the Engineer) shall sign all Bills of Lading upon final review and approval.

B. DCAMM shall have final approval over all disposal options based on the analytical data.

3.02 UNSATURATED ZONE SOIL:

A. Unsaturated zone soil shall be stockpiled, treated, and reused as backfill in accordance with Sections 025000 – SITE REMEDIATION and 312000 – EARTH MOVING.

3.03 SATURATED ZONE SOIL:

A. The Contractor shall transport saturated zone soil for off-site recycling, disposal at a landfill, or at another appropriately licensed facility.

B. Saturated zone soil shall be handled using a Contractor-prepared Bill of Lading. The Engineer will prepare the Licensed Site Professional (LSP) opinion letter within five working days of Contractor submittal of disposal characterization data. The Contractor shall submit the proposed landfill or facility disposal documentation to the Engineer for review and approval and obtain facility approval prior to transportation of saturated zone soil.

C. Saturated zone soil shipped to recycling/disposal facility must meet the selected facility's chemical and physical acceptance criteria. Selected facilities must be established, fully operational, appropriately insured, and be operating in compliance with all applicable local, state, and federal regulations.

3.04 WEIGHT AND MEASUREMENT**:**

A. The tare and gross weight for every vehicle, container, and trailer transporting material for off-Site reuse, recycling, treatment or disposal shall be measured to determine the net weight.

B. The Contractor shall provide certified tare and gross weight slips for each load received at the accepted Facility which shall be attached to each returned manifest.

3.05 WASTE PROFILES AND MANIFESTS:

A. The Contractor shall prepare and submit to DCAMM for review all waste profile applications and questionnaires , and coordinate with disposal facilities and all Federal and State Environmental Agencies. Refer to Paragraph 1.03 B. DCAMM will require a minimum of one week for review of all profiles, questionnaires and offsite disposal/recycling paperwork.

B. The Contractor shall prepare all Manifests, Bills of Lading, and material shipping records with all applicable analytical backup, notification, and control forms. Final copies of Bills of Lading shall be signed by DCAMM (or his/her designated representative) as generator following submission and approval by the Engineer of draft Bills of Lading.

C. The Contractor shall also provide certified tare and gross weight slips for each load received at the designated facility which shall be attached to each returned manifest.

D. DCAMM (or his/her designated representative) will be designated as generator and will sign all manifests and waste profile application or questionnaires.

E. The Contractor shall furnish all generator copies of the Hazardous Waste Manifest to DCAMM for submittal to the appropriate regulatory agencies and to retain for DCAMM's records.

F. The Contractor shall submit to DCAMM, prior to receiving progress payment, documentation certifying that all materials were transported to, accepted, and disposed of,

at the selected disposal facility. The documentation shall include the following, as a minimum.

1. Documentation shall be provided for each load from the site to the disposal facility, including all manifests and any other transfer documentation as applicable.

2. All documentation for each load shall be tracked by the original manifest document number that was assigned by the Engineer at the site.

3. All ORIGINAL signatures (including signatures of DCAMM and disposal facility's representative) associated with shipment of any material from the site under a Bill of Lading.

3.06 TRANSPORT OF EXCAVATED MATERIAL:

A. The Contractor shall not be permitted to transport excavated materials off-site until all disposal or recycling facility documentation has been received, reviewed, and approved by the Engineer.

B. The Contractor shall take all precaution and any actions necessary, at no additional cost to DCAMM, to prevent cross-contamination from transport vehicles to areas outside the "impacted area". The Contractor shall utilize an equipment and vehicle decontamination station to clean vehicles prior to leaving the site.

C. The Contractor shall transport saturated zone soil from the site to the disposal, reuse or recycling facility in accordance with all United State Department of Transportation (DOT), USEPA, and MADEP regulations.

D. The Hauler(s) shall be licensed in all states affected by transport.

E. The Contractor shall be responsible for ensuring that free liquid is properly transported. "Wet soils" shall not be loaded for transport. The Contractor shall dewater "wet soils", and properly dispose of free liquid. The Contractor shall dispose of any free liquids that may result during transportation at no additional cost to DCAMM.

F. Temporary stockpiled soil must be removed from the site in accordance with applicable regulatory deadlines; however, no later than the completion date of this Contract as may be extended.

3.07 DISPOSAL/RECYCLING:

A. Dispose/recycle of excavated materials at an approved facility in accordance with all federal, state and local regulations.

B. The Contractor shall perform analyses on the excavated material as necessary to fulfill any disposal testing requirements of the approved Facility in accordance with paragraph 3.03 of Section 026113.

1. The Contractor shall notify the Engineer at least two (2) days prior to sampling and the Engineer must be present for all sampling activities by the Contractor. The Contractor shall bear all costs incurred in sampling and analyses for those tests required by the facility.

2. The Contractor shall submit a copy of all sampling analyses to the Engineer within two (2) days of receipt of the laboratory report. Analytical data shall be kept confidential, distributed to the Engineer and DCAMM only.

C. The Contractor shall provide to the Engineer copies of all weight slips, both tare and gross, for every load weighed and disposed of at the approved facility. The slips shall be tracked by the original manifest document number that was assigned by the Engineer at the site. The Engineer shall make progress payments after receipt of these weight slips.

3.08 LOGS, REPORTS, AND RECORDKEEPING:

A. At a minimum, the Contractor shall maintain daily logs and reports covering the work to be performed for this Section of the Contract. The format shall be developed by the Contractor to include daily logs, weekly reports, and a phase out report. Contractor shall provide Engineer with copies of all logs and reports on a weekly basis.

B. Daily Logs shall include, at a minimum, the following:

1. Date
2. Area (site specific) of work being performed
3. Equipment being utilized by employees
4. Type of work performed
5. References to/copies of manifests, bills of lading, and waste profiles
6. Sample locations and sample identifications
7. Details and documentation of remediation waste management
8. Protective clothing being worn by employees
9. Project manager signature and date

C. Weekly Reports shall include, at a minimum, the following:

1. A summary of the work performed during the week
2. Copies of the daily logs

D. Close Out Report shall include, at a minimum, the following:

1. Summary of work performed under this Section of the Contract
2. Copies of all manifests, bills of lading, and waste profiles
3. Laboratory reports and plans indicating sample locations

4. Project managers signature and date

END OF SECTION

\\wse03.local\WSE\Projects\MA\DCAMM\Medfield State Hospital\SPD Area Groundwater\Remediation - Soil Blending\Specs\Division 02\02 61 16 - Transportation and Disposal of Impacted Material.docx

APPENDIX E

Public Notification Letters

Weston & Sampson SM

55 Walkers Brook Drive, Reading, MA 01867 (HQ)
Tel: 978.532.1900

November 12, 2020

Town of Medfield Board of Health
c/o: Ms. Nancy Bennotti
Board of Health – Administrative Agent
459 Main Street
Medfield, MA 02052

Re: **Phase IV SPD Area Groundwater Remedy Implementation Plan Modification**
Former Medfield State Hospital
45 Hospital Road
Medfield, Massa

Dear Ms. Bennotti:

Weston & Sampson, on behalf of the Massachusetts Division of Capital Asset Management and Maintenance (DCAMM), is hereby notifying your office that a Phase IV Special Project Designation (SPD) Area Groundwater Remedy Implementation Plan (RIP) Modification for the abovementioned location has been submitted to the Massachusetts Department of Environmental Protection (MassDEP).

The original Phase IV SPD Area Groundwater RIP describes the implementation of the selected comprehensive remedial action [in-situ chemical oxidation (ISCO)] for the SPD Area groundwater. The chosen remedial action alternative was evaluated based on its benefits, limitations, costs, and ability to meet the requirements of the Massachusetts Contingency Plan (MCP) evaluated under a Phase III Remedial Action Plan. ISCO was implemented at the site in 2014 and 2015 and initial groundwater concentrations decreased dramatically. Since that time, rebound of groundwater concentrations has occurred due to residual source area and matrix diffusion of contaminants from fine-grained soil to groundwater. This RIP modification has been submitted to describe source removal via excavation and off-Site disposal and backfill with Zero Valent Iron (ZVI) treated soil blending. A Permeable Reactive Barrier (PRB) wall will also be constructed to further treat SPD Area groundwater.

This notification is provided in accordance with public involvement requirements of the MCP 310 CMR 40.0874. The Phase IV SPD Groundwater RIP Modification is on file and available for review at MassDEP's regional office in Worcester, Massachusetts and online at http://public.dep.state.ma.us/SearchableSites2/Search.aspx. If you have any comments or questions regarding the site, please contact the undersigned at 978-573-4040.

Sincerely,

WESTON & SAMPSON ENGINEERS, INC.

Frank Ricciardi, P.E., LSP
Vice President

November 12, 2020

55 Walkers Brook Drive, Reading, MA 01867 (HQ)
Tel: 978.532.1900

Ms. Kristine Trierweiler
Medfield Town Administrator
459 Main Street
Medfield, MA 02052

Re: Phase IV SPD Area Groundwater Remedy Implementation Plan Modification
Former Medfield State Hospital
45 Hospital Road
Medfield, Massa

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Sincerely,

WESTON & SAMPSON ENGINEERS, INC.

Frank Ricciardi, P.E., LSP
Vice President