AECOM

Artificial Turf Field and Site Hydrogeologic Investigation Report

Greenwich High School
10 Hillside Road
Greenwich, Connecticut

Town of Greenwich

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	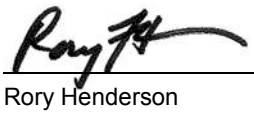	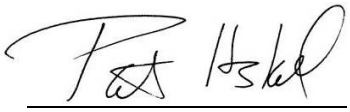	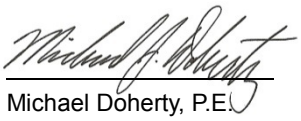
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List of Acronyms

Acronym	Definition
bgs	Below Ground Surface
CFR	Code of Federal Regulations
COCs	Chemicals of Concern
CSM	Conceptual Site Model
DEEP	Connecticut Department of Energy and Environmental Protection
DTC	Diversified Technology Consultants
EM	Electromagnetic
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
ETPH	Extractable Total Petroleum Hydrocarbons
GPR	Ground Penetrating Radar
GWPC	Groundwater Protection Criteria
HHRA	Human Health Risk Assessment
IRM	Interim Remedial Measure
MISA	Music Instructional Space and Auditorium
NOAA	National Oceanographic and Atmospheric Administration
NWS	National Weather Service
PAHs	Polycyclic aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
QA/QC	Quality Assurance / Quality Control
RAP	Remedial Action Plan
RCPs	Reasonable Confidence Protocols
RI	Remedial Investigation
RSR	Connecticut Remediation Standard Regulations
R VC	Residential Volatilization Criteria
SWPC	Surface Water Protection Criteria
TSCA	Toxic Substances Control Act
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

1. Introduction

AECOM was contracted by the Town of Greenwich (the Town) to develop a Remedial Action Plan (RAP) (AECOM, 2013a) for Greenwich High School, which located at 10 Hillside Road, Greenwich, Connecticut (the Site). Following submittal of the RAP to the United States Environmental Protection Agency (EPA) and the Connecticut Department of Energy and Environmental Protection (DEEP) (collectively, "the agencies"), a series of discussions were held between the Town and the agencies regarding the remedial plans. In 2014, the Town provided a written response to an initial series of agency comments regarding the hydrogeology of the Site (AECOM, 2014), and then a series of detailed comments were issued by the agencies in a letter dated January 5, 2015. As part of the response to these comments, AECOM conducted a hydrologic and hydrogeologic investigation and artificial turf field evaluation to obtain data that address comments provided by the agencies. The scope of the investigation activities described herein was detailed in the July 2016 Site Investigation Work Plan (AECOM, 2016), which was submitted along with preliminary written responses to agency comments. This preliminary response to comments is attached as **Appendix A**. This report and the attached cover letter provide an update and, in some cases, supersede the preliminary response to comments. This report references previously submitted documents including the Remedial Investigation (RI) report (AECOM, 2013b), the Human Health Risk Assessment (HHRA) report (AECOM, 2013c), and the RAP (AECOM, 2013a).

1.1 Site Background

Greenwich High School is located at 10 Hillside Road in Greenwich, Connecticut, which is approximately 73.61 degrees west longitude and 41.04 degrees north latitude. The school resides on a 54.75 acre parcel owned by the Town of Greenwich. A Site location map is included as **Figure 1**. A Site plan, depicting pertinent Site features, is included as **Figure 2**.

The Site is currently used as a public high school with associated athletic facilities. The southeast corner of the Site has been undeveloped since the Town purchased the property in 1966; private residences were formerly located in this area. Improvements on other portions of the Site include the high school buildings, paved parking areas, natural and artificial turf athletic fields, tennis courts, batting cages, landscaped areas, and paved pedestrian walkways. Utilities servicing the property include municipal water, storm water drainage, sanitary sewer, electricity, and communications. Heating is provided by oil-fired boilers; fuel oil for heating is stored on the Site in a 15,000-gallon underground storage tank (UST).

A fenced utility area, located between Wing B and the brook, encloses a transformer, owned and operated by Connecticut Light & Power, switching gear cabinets, and an emergency electrical generator with an integral 200-gallon diesel day tank. A steel storage container stores maintenance vehicles and small quantities of gasoline. A 1,000-gallon diesel UST for the generator is located between the fenced area and the adjacent paved parking area. Adjacent to the fenced utility area is an evaporative cooler used by the air conditioning system. The southeast corner of the property is wooded.

There are seven athletic fields at the Site, consisting of both natural and artificial turf fields that are used for various sporting activities. Fields #2 and #5 are natural grass fields, and the remainder are artificial turf fields. Field #1 is the football stadium, and is located south of West Brothers Brook. Fields #2, #3, and #4 are located to the north and east of West Brothers Brook immediately adjacent to the culverted portion of the brook. Fields #5, #6, and #7 are located north of the Western Parking Lot to the east and north of Field #4. Several of the fields were constructed over the contaminated fill in AOC 1, including most of Fields #2, #3, #4, and #5 and the western portion of Field #6. Artificial turf fields are constructed (from top down) of green turf fabric and crumb rubber, underlain by a drainage blanket, cushion, a stone base, and a geotextile that separates the stone base from soil beneath. The thickness of the artificial turf field materials, drainage layer, and stone base ranges from approximately 7 to 12 inches.

During the initial construction phase for the high school in the late 1960s, bid documents and historical construction drawings indicate that the brook was rerouted along the western portion of the Site into the concrete channel it currently occupies. These documents also indicate that, during construction of the high school buildings, fill was brought onto the property to fill the wetlands to grades similar to those that

currently exist. The filling activities and diversion of West Brothers Brook occurred between late 1960s and early 1970s, which terminated the function of the wetlands that formerly existed at the property in the area of the Western Parking Lot and Fields #2, #3, #4, #5, #6 and the southwestern portion of Field #7. The high school buildings were constructed on the eastern portion of the property, beyond the limits of the historical wetlands, on areas of shallow bedrock or bedrock outcrops. In the early 1970s, additional fill was imported to level an area settling in the western parking lot. This area of settling was a paved parking lot prior to the import of additional fill and was restored as such following these operations.

1.2 Regulatory Status

The Site is under the jurisdiction of EPA under the Toxic Substances Control Act (TSCA) (EPA, 2011) with regard to polychlorinated biphenyls (PCBs) detected in soil and other environmental media. Soil with PCB concentrations greater than or equal to 50 milligrams per kilogram (mg/kg) are classified as PCB Remediation Waste in §761.3 of Chapter 40, Code of Federal Regulations, Part 761 (40 CFR Part 761), and environmental impacts that occurred subsequent to 1978 related to such material is likewise regulated as PCB Remediation Waste. Because soil with PCB concentrations at or above this level have been identified at the Site, the Town is working directly with the EPA Region 1 PCB Coordinator and DEEP's Bureau of Materials Management and Compliance Assurance PCB Program staff with regard to investigation and remediation of PCBs.

In May 2017, the Town entered the Site into the DEEP Voluntary Remediation Program (VRP), pursuant to Connecticut General Statutes Section 22a-133x, following submittal of an Environmental Conditions Assessment Form. The investigation and remediation of the Site is therefore subject to the Remediation Standard Regulation (RSRs; CT DEEP, 1996). Following submittal of the VRP schedule, DEEP indicated that it would provide direct oversight of investigation and remediation activities at the Site.

Applicable soil cleanup criteria for the Site include the Residential Direct Exposure Criteria (R DEC), which apply to polluted soils located between the ground surface and 15 feet below ground surface (bgs), unless access to the soil is restricted consistent with the RSRs, and the Pollutant Mobility Criteria for areas with groundwater classified GA, which are areas where groundwater is assumed to be suitable for consumption without treatment. Numerical criteria used to evaluate soil data at the Site include those from the 1996 RSRs. The 1996 RSRs included numerical criteria for a limited number of compounds. To address this limitation, DEEP approved a number of Additional Polluting Substances (APS) and alternative criteria for state-wide use and published these criteria (DEEP, 2018). For purposes of evaluating the significance of releases of compounds without numerical criteria from the 1996 RSRs, the latest recommended criteria for APS were used as screening criteria for the Site.

Groundwater criteria for the Site include the Surface Water Protection Criteria (SWPC) and the Groundwater Protection Criteria (GWPC) and, for volatile organic compounds (VOCs), the Residential Volatilization Criteria (R VC). The SWPC are compared to the groundwater at the Site as there is a potential for groundwater to discharge to surface water bodies located on the Site. The GWPC are compared to the Site groundwater data because the Site is classified as a GA area. The R VC are compared to groundwater to evaluate the potential for VOCs in groundwater to impact indoor air.

1.3 Previous Investigation and Remediation Activities

The athletic fields were closed to public use following the discovery of PCBs and other chemicals in soil at concentrations above federal and state regulatory guidelines during construction activities associated with construction of the Music Instructional Space and Auditorium (MISA) at Greenwich High School. A series of investigations were performed to delineate the environmental impacts and further evaluate their potential risk to human health and the environment. A series of interim remedial measures (IRMs) were implemented to allow the athletic fields to be reopened for use by the public, to complete the construction of the MISA wing, and to expand the western parking lot to accommodate the space occupied by the MISA. The following is a summary of the investigations and IRMs performed to date. The activities described below have previously been reported to federal and state regulators and have been released to

the public. The reports identified below are available through the Greenwich Public Schools Communications Office.

- Phase I Environmental Site Assessment (ESA) – Diversified Technology Consultants (DTC), August 2011: The Phase I ESA identified AOCs and provided recommendations for additional work.
- Site Investigation Activities – DTC, August and September 2011: Initial investigation activities included surficial soil sampling and focused soil borings, asphalt sampling, and bedrock sampling. Results were reported in AECOM's Remedial Investigation Report (see below)
- Interim Remedial Measures – DTC, 2011: Interim Remedial Measures (IRMs) included soil excavation and/or placement of fencing to restrict access to areas with impacted surficial soil. IRM completion reports were prepared by DTC and submitted to the regulators.
- Remedial Investigation Report – AECOM, February 2013: The RI report documented initial remedial investigation activities performed during 2011 and 2012.
- Screening Level Ecological Risk Assessment (SLERA) – AECOM, February 2013: The SLERA evaluated risk to ecological receptors associated with West Brothers Brook and Cider Mill Pond. The SLERA was amended in October 2017 to include data from upstream and downstream sediment and surface water samples and to update the risk evaluation.
- Human Health Risk Assessment – AECOM, April 2013: The HHRA evaluated risk to human health and the environment posed by constituents of concern (COCs) at the site and provided a basis for development of the initial Remedial Action Plan (RAP) for the site.
- Focused Feasibility Study (FFS) – AECOM, April 2013: The FFS evaluated remedial alternatives for the site and provided a framework, along with the HHRA, for development of the RAP.
- Remedial Action Plan – AECOM, November 2013: The RAP proposed to address PCB impacts in accordance with risk-based disposal provisions of TSCA [40 CFR 761.61(c)] and the results of the HHRA (AECOM, 2013c). The RAP proposed to remove shallow soils impacted in areas where soil is not located under durable artificial turf and thereby provide additional protection against potential future risk of exposure. The RAP was the subject of two rounds of comment and response between DEEP and the Town/AECOM and to date has not been fully implemented. The Town and AECOM are working with the regulators to address comments received on the RAP, and much of that work is documented herein.
- Phase I Remediation – Summer 2014: The Town and AECOM implemented an interim remedial action on the southern portion of the property during the summer of 2014. The remedial action addressed soil containing pesticides, arsenic, and benzo(a)pyrene. Cleanup criteria for the Phase I remediation were based on the results of the HHRA for these constituents with DEEP approval of an alternate cleanup criterion for arsenic.
- Music and Instruction Space Auditorium construction - 2012 through 2017: The Town implemented an interim remedial action to allow completion of the MISA construction. The MISA construction was completed pursuant to a PCB Cleanup Plan, which was approved by EPA under the risk-based disposal provisions of TSCA, subject to specific conditions regarding the management and disposal of PCB-impacted soil and groundwater.
- Western Parking Lot Expansion – Summer 2015: To facilitate additional parking areas and upgrade stormwater drainage at the site, the Town completed a construction project to expand the western parking lot, install additional lighting and stormwater drainage during the summer of 2015. During the construction activities soil remediation was performed including excavation and off-site disposal of PCB-impacted soil, under a TSCA risk-based disposal approval from USEPA, and disposal Connecticut-regulated waste.
- Site Investigation Work Plan – AECOM, July 2016: This work plan was developed to address DEEP comments on the RAP pertaining to the hydrogeologic conceptual site model, as well

questions related to the synthetic turf fields. Findings from activities performed under this work plan are presented in this report.

- Environmental Conditions Assessment Form (ECAF) – AECOM, May 2017: Following discussions with DEEP, the Town decided to enter the site into the Voluntary Remediation Program. An ECAF was submitted in May 2017. In the ECAF acknowledgement, DEEP indicated that they would retain oversight of the investigation and remediation of the site (DEEP lead).
- Data Gaps Investigation Work Plan – AECOM, February 2018: This work plan was developed to address data gaps identified at the site relative to assessing compliance with the RSRs and planning remedial activities accordingly and to address DEEP comments on the RAP related to RSR-compliance issues.

Prior groundwater investigations conducted at the Site are summarized in the RI Report (AECOM, 2013b). These investigation results were used to develop a Conceptual Site Model (CSM) to provide understanding of the nature and distribution of the environmental impacts and the potential risks to human health and the environment. This CSM is summarized in **Section 2.4**.

1.4 Current Investigation Objectives

The agencies issued comments on the RAP during January 2015. As part of the response to these comments, AECOM proposed additional data collection related to the artificial turf fields, Site drainage, hydrology, and hydrogeology. The scope of work was detailed in a 2016 Site Investigation Work Plan, and the results are documented herein. Other comments on the RAP are being addressed as part of a supplemental Phase II/Phase III investigation, which is being performed concurrent to this hydrogeologic investigation and will be reported in April 2019. Specific work activities performed as part of this hydrogeologic investigation were designed to provide additional information on:

- Groundwater Elevations:
  - The nature of the groundwater mound beneath a portion of the artificial turf fields;
  - The effect of changes in groundwater elevation on the movement of contaminants in groundwater;
  - The vertical component of the hydraulic gradient within the aquifer and the vertical distribution of PCBs in groundwater;
  - The effect of the re-routed stream channel and former wetland on current groundwater flow; and
  - The selection and justification of reference groundwater wells and the extent of groundwater PCB impacts.
- Infiltration and runoff:
  - Further assessment of Site-specific infiltration rates;
  - The potential for groundwater to breach ground surface;
  - Whether PCB-impacted groundwater could be transported to the surface through episodic flooding; and
  - Whether runoff from the artificial turf fields could contain PCBs.
- Groundwater – surface water exchange:
  - Evaluating surface water elevation within natural and modified portions of the stream relative to groundwater; and
  - The nature of groundwater exchange with the stream; including during precipitation events.

Several activities are described herein address these conceptual gaps in the hydrogeologic study. The information obtained was used to respond to the agencies' questions and to support a framework under which Site remediation will be performed.

2. Environmental Setting

Most of the Site was filled and graded in the 1960s to facilitate the construction of the high school, parking areas, athletic fields, and other improvements. The National Flood Insurance Rate Map referenced in the Phase I ESA dated June 18, 2010, identified that the majority of the Site is located within Zone X, outside of the 500-year floodplain. Portions of the Site in the vicinity of West Brothers Brook are located in Zone AE, within the 100-year floodplain.

2.1 Geology

Based on soil borings advanced at the Site, the overburden material encountered over most of the Site consists of a silty, sandy till overlying bedrock. The till contains a variegated mixture of gravel, cobbles, and boulders. An extensive layer of peat and organic silt associated with the former swamp deposits is found beneath Fields #3, #4, #5, a portion of Field #6, and the west parking lot. Non-native fill material is present in the former wetlands area.

Three geologic cross-sections were prepared to illustrate the distribution of subsurface materials at the Site. **Figure 3** provides a Site plan with cross section locations. As shown in **Figure 4**, cross-section A-A' traverses from south to north across the Site and extends from West Brothers Brook in the south, through the athletic fields, to the property boundary on the north. As presented in **Figure 5**, cross-section B-B' trends from west to east, beginning at West Brothers Brook, extending beneath Field #4, the west parking lot, the MISA auditorium, the Science Wing of the high school, and terminating at Hillside Avenue. As shown in **Figure 6**, cross-section C-C' traverses from west to east, beginning at West Brothers Brook, extending between Field #2 and Field #3, and terminating at the west parking lot. The cross-sections do not depict the portion of the Site south of West Brothers Brook. In this area, native till overlies bedrock at depths of between zero and 15 feet below ground surface (feet bgs).

These sections illustrate the presence of a thin layer of sandy/silty till overlying areas of shallow bedrock at the northern and eastern portions of the Site. Non-native fill material overlies a dark brown peat layer, assumed to be native materials, beneath the west parking lot and Fields #3, #4, #5, #6 and portions of Field #7. The cross-sections also illustrate the undulating nature of the bedrock surface at the Site with a depression in the central portion where the wetlands were formerly located. The Site topography has been modified over the years due to construction activities related to the high school and athletic fields. Two historical maps are provided that show past Site features. These include a 1934 aerial photograph and a 1951 topographic map presented as **Figures 7 and 8**, respectively. Both the 1934 and 1951 maps show a relatively large wetland area once occupied the central portion of the Site beneath the west parking lot and athletic Fields #2, #3, #4, #5, #6, and the southwestern portion of Field #7.

The following is a summary of the subsurface geologic materials encountered beneath the west parking lot and athletic Fields #2, #3, #4, and# 5. Outside these areas, the materials encountered on-site generally include only dense till and/or bedrock.

1. Surficial Materials: Generally six inches of topsoil (or asphalt in parking lot areas).
2. Fill: The non-native fill materials can generally be described as generally medium to very dense, fine to medium sand with some silt and traces of gravel with debris containing trace amounts of cinders, brick, glass, roots, wood, plastic, and rubber. Other fill materials consisted of silty sand with gravels, cobbles and boulders, similar to the native soils encountered at the Site and may represent reworked native materials moved during construction activities. In general, fill materials were encountered at depths ranging anywhere from the surface to 14 feet bgs. The thickness of the fill material encountered varies greatly across the Site. The most extensive layer of fill material was encountered in the southeastern corner of Field #3 and beneath portions the Western Parking Lot (**Figure 6**). Fill material appears to be found less extensive towards the exterior perimeters of the defined AOC 1 (see **Figure 3**).

3. Peat/Organic Silt: Beneath the non-native fill, a layer of soft organic material extended to depth ranging from 2.5 to 28 feet bgs, shallower beneath the parking lot and deeper under the athletic fields. The maximum thickness of peat/silt encountered measured 18.5 feet. An extensive layer of peat and organic silt associated with the former wetlands is found beneath athletic Fields #2, #3, #4, #5, portions of Field #6, and beneath the western parking lot, as depicted on **Figure 6**.
4. Dense Till: A layer of dense silty sands (till) was encountered beneath the non-native fill and the peat/organic silt units. This material contained varying amounts of gravel, cobbles and boulders and extended to depths ranging from 8.5 to 59 feet bgs. A thin layer of sandy silty till overlying areas of shallow bedrock is found at the northern and eastern portions of the Site.
5. Gneiss Bedrock: Gneiss was encountered in numerous borings across the Site. Depth to bedrock surface ranged from zero to 59 feet bgs. At some boring locations, the upper one to two feet was decomposed (weathered) and was easily drilled. In general, the competency of the rock increased with depth.

2.2 Surface Water

Two water bodies have been observed on historical maps. The central portion of the property was a former wetland. An unnamed pond that is currently referred to as Cider Mill Pond is shown in the southeast corner. West Brothers Brook historically entered the property at the same location as it does currently, flowed southeast into the wetlands and then beyond through Cider Mill Pond.

Construction of the high school resulted in the wetlands being filled and West Brothers Brook being diverted through a concrete lined channel to accommodate playing fields and other improvements associated with the school. Currently, West Brothers Brook enters the Site from the northwest corner of Field #4.

West Brothers Brook enters the Site from the northwest corner of the Site. On the western portion of the Site, surface water in the brook is controlled within a concrete channel and flows south past Fields #4, #3 and #2, curves around Field #2 to the east and then briefly to the northeast. The concrete channel then makes a sharp turn and West Brothers Brook is re-directed back into its natural channel, which flows to the southeast toward Cider Mill Pond.

The southern portion of West Brothers Brook is impounded behind a man-made boulder dam that forms Cider Mill Pond, which is located south of the school buildings. At the toe of the dam, the surface water level drops approximately 15 feet and flows through three reinforced concrete pipes that allow surface water to exit the property and pass beneath East Putnam Avenue.

The portion of West Brothers Brook downstream of the Pond and Cider Mill Pond at the Greenwich High School property is within the 100-year flood plain as mapped by the Federal Emergency Management Agency.

2.3 Groundwater

DEEP has designated groundwater beneath the Site as GA quality. Groundwater categorized as GA is considered suitable for drinking or other domestic uses without treatment.

Two types of groundwater aquifers are present in the Greenwich area: (1) aquifers in surficial deposits including till, lacustrine, and fill deposits; and (2) aquifers in the fractured crystalline bedrock. Natural groundwater recharge to either of these aquifers is derived primarily from precipitation that infiltrates from the land surface to the water table. Other natural sources of recharge include loss of water from lakes, wetlands, and streams.

At the Site, groundwater has been observed in shallow overburden materials that include till, fill and wetland (peat or highly organic) deposits. The thickness of the fill material encountered varies greatly across the Site influencing the groundwater levels observed in monitoring wells across the Site. Previous studies in Connecticut have shown that a large percentage of groundwater within till areas discharges directly from the till into small nearby streams and intermittent watercourses during wet periods. Under

natural conditions, most recharge to surficial deposits within valley-bottom locations does not enter bedrock. These areas are typically associated with groundwater discharge; therefore, groundwater is more likely to flow upward from the bedrock aquifer to the surficial deposits than downwards from the surficial deposits to the bedrock aquifer (Melvin, 1992). Thus, groundwater at the site is understood to discharge to West Brothers Brook, rather than infiltrating bedrock.

Manual and continuous water level readings have been collected at the Site. Manual water levels were collected from both monitoring wells and surface water gauging locations. The continuous water levels were recorded automatically using pressure transducers installed within ten separate monitoring wells. Groundwater level measurements indicate the depth to groundwater is relatively shallow and the overall groundwater flow direction roughly mimics the topography. That is generally from N-NW to the S-SE portions of the property. Groundwater and surface water gauging activities are described in **Sections 4.3 and 4.5**.

Even though the upper portion of West Brothers Brook is underlain by a concrete channel, the flow of groundwater towards West Brothers Brook along this section is not unexpected. The upper part of West Brothers Book is lined with concrete with clearly visible seams and cracks. At these locations, under low surface water flows, groundwater partially discharges to surface water. Evidence of groundwater discharging to surface water via cracks in the concrete channel is further supported by the Thermal Infrared Survey performed and described in **Section 4.5.1**. In addition, historical construction maps indicate that the channel was most likely lined with gravel to facilitate the pouring of concrete. Therefore, a preferred groundwater flow pathway may exist immediately beneath the concrete sections, such that groundwater migrates along it to the cracks in the concrete sections. It is possible that during periods of flooding, when brook elevation is higher than groundwater elevations, that recharge to the shallow portion of the aquifer from the brook occurs; however, as such floods are episodic in nature, the net flow is believed to be discharge to the brook.

There is an area of locally higher groundwater elevation centered beneath Field #3. This hydraulic condition has been observed to be present during both wet and dry conditions (i.e., a period of no rain with no irrigation). Discussion of groundwater elevations and flow directions pertinent to this area of localized high groundwater elevation is included in **Section 4.3**.

2.4 Conceptual Site Model

The conceptual site model (CSM) for the Site was developed and refined during remedial investigation activities completed at the Site between August 2011 and June 2013. The following is a summary of the current CSM for the Site that was used to develop the work plan for this investigation.

2.4.1 Site Development

Prior to 1966, the Site was undeveloped except for residences that were located along the current eastern and southern property boundaries. Historical maps of the property depict a wetlands located in central portions of the Site. The Town of Greenwich purchased the property in 1966, demolished the former residences, and commenced construction of the high school. Historical records indicate that the brook on Site was diverted at that time, and fill material was used for filling and grading the Site for future use (AECOM, 2013b).

2.4.2 Sources of Contamination

The fill material is the primary source of chemical impacts at the Site. COCs identified in the fill include PCBs, extractable petroleum hydrocarbons (ETPH), polycyclic aromatic hydrocarbons (PAHs), and metals. Pesticides have also been identified in the AOC 1 fill area; however, pesticide impacts are not inherent to the fill material brought to the Site (AECOM, 2013b), as the highest pesticide concentrations detected in this area were shallow impacts in soil above the impacted fill material.

2.4.3 Potential Exposure Pathways

The mobility of chemicals through the environment depends on physical properties of the chemicals (e.g., solubility in water, volatility, etc.), as well as properties of the media (soil permeability, pH of groundwater, etc.). The potential migration pathways that were evaluated as part of the CSM development include:

- Leaching of chemicals from impacted soils into groundwater;
- Transport of contaminated groundwater through natural soils, fill, and subsurface conduits;
- Transport of dissolved contaminant or contaminated suspended solids in surface water, including stream flow, stormwater in conduits, and overland flow; and
- Translocation of contaminated solids during historical construction activities, as adhered particles or in dust.

During the RI, there were limited detections of VOCs in soil, groundwater, soil vapor or ambient air. Evaluation of the data in the RI and HHRA indicated that vapor migration is not a completed pathway for exposure (AECOM, 2013a, 2013b).

2.4.4 Potential Contaminant Migration Pathways

Leaching of chemicals from impacted soil into groundwater is believed to be occurring at the Site because dissolved PCBs have been identified in groundwater at the Site. However, due to the low solubility and affinity of PCBs for organic phases, the groundwater transport of these chemicals is limited to the immediate vicinity of the soil impacts, and the data indicate that there is no off-Site migration of these impacts and that groundwater concentrations adjacent to surface water bodies are below the SWPC. In addition, there are currently no on Site uses of groundwater (i.e., drinking water or irrigation) and these chemicals detected in the groundwater are not volatile, so there is no direct exposure to contaminants through groundwater. Thus, leaching of chemicals and groundwater transport has not been considered to be a complete pathway for exposure. The potential for migration of contaminated groundwater was assessed further during this investigation, and thus, this pathway is further evaluated herein.

Surface water samples were collected during the remedial investigation phase to evaluate transport through this media. PCBs were not detected in surface water samples from either West Brothers Brook or Cider Mill Pond. Most detected constituents, aside from pesticides and one phthalate compound were detected in surface water at maximum concentrations below screening levels, and the HHRA found that the impacts measured did not pose an unacceptable risk to human health. The SLERA carried forward assessment of pesticides for further ecological risk assessment.

Additional characterization of groundwater-surface water interactions was performed during this investigation and is discussed herein.

Discussion of additional data collected as part of the hydrogeologic investigation and the further development of the CSM is presented in the sections below.

2.4.5 Infiltration and Recharge

Many of the regulator comments on the RAP related to the response of the groundwater aquifer to precipitation. This is governed by the processes of infiltration and recharge which are discussed below.

As rain falls, vegetation may first intercept and impede water falling and making contact with the ground. During light precipitation events, the water may be captured by the vegetation layer (e.g., tree canopy, grass) and evaporate before touching the soil. In larger events, the storage capacity of the vegetation is exceeded and water reaches the ground surface. Local soil conditions (e.g. compaction, soil moisture, soil structure, vegetative uptake) dictate the rate at which water can infiltrate. Soils with lower initial moisture content will typically have a stronger matric potential (or negative pressure) essentially pulling water from precipitation in at a faster rate than soil with higher initial moisture content. If soil is initially dry,

the initial infiltration rate is higher than the infiltration rate under successive wetting events, and the infiltration rate drops as a function of moisture content.

Under successive wetting events (i.e. precipitation events that exceed the storage capability of the overlying vegetation), the infiltration rate drops. If the rainfall intensity exceeds the infiltration rate, which has a higher likelihood of occurring during very wet periods, puddling and ponding may occur. Ponded water may runoff, depending on slope of the surrounding topography and surface conditions. Less runoff occurs in vegetated areas than compacted, bare soil areas or areas with impervious surfaces like pavement. As rainfall intensity increases and if sufficient slopes are present, runoff may become intense and have enough energy to scour the ground developing erosional features which may potentially transport water and soil/sediment to other portions of the Site.

Infiltrated rainwater propagates through the vadose zone as a wave of transient saturation. Water will move downward under the influence of gravity and matric potential. The wave of pore water saturation will continue to move downward until reaching the capillary fringe above the water table, where the aquifer is partially saturated due to capillary suction. The downward migrating front will assimilate with the capillary fringe, and the water table elevation will thereby increase. The assimilated rain water is now subject to saturated flow processes.

Under successive rain events, it may be possible for groundwater elevations to increase such that groundwater intersects the ground surface. Under these circumstances, gravity will continually work to promote downward movement of the water, or where restricted by lower permeability materials underlying the shallow aquifer, will flow radially away to areas of lower groundwater elevation. Under precipitation/infiltration derived recharge to the subsurface and increases in groundwater elevation, the shallowest groundwater represents water that has infiltrated from the top down and does not represent water that is flowing from deeper portions of the aquifer up to the surface.

The artificial turf fields, which have a drainage layer with a high capacity to transmit water away from the fields, have the potential to affect the nature of runoff and infiltration. An assessment of the nature of these effects is provided herein.

2.4.6 Groundwater Flow

The Site is surrounded by elevated land features to the east, north, and west, and bedrock outcrops are present around and on much of the Site. The bedrock surface beneath the Fields #2, #3, and #4 forms a bowl-like structure, in which a wetland formed with fine-grained sediment and plant materials accumulating into a silty peat layer over time. Prior to the construction of the athletic fields, historical channels were present in the wetland complex, some of which appeared to act as headwater-like groundwater discharge zones adjacent to upland areas, alongside a main channel (i.e. West Brothers Brook prior to its relocation), which bisected the wetland complex from northwest to southeast. Fill materials were placed in these channels and over the wetland to build the Site recreational facilities. However, groundwater recharge is still understood to occur from the area of the former headwaters, and filled channels may act as preferential migration pathways where silt/peat deposits are thinner.

Groundwater flow contours indicate a primary northwest to southeast direction to groundwater flow across the Site. A mound is evident in the water table that is centered beneath the southern portion of Field #3, which is the portion of the filled wetlands that is furthest removed from locations with natural discharge to surface water, subsequent to the construction of a concrete culvert to re-route West Brothers Brook. A detailed discussion of groundwater elevation and groundwater flow is provided in **Section 4.4**.

3. Artificial Turf Field Evaluation

The activities described in this section are intended to provide additional information related to drainage, groundwater recharge, and material quality of the artificial turf fields.

As part of this evaluation, AECOM assessed whether PCBs had impacted turf field construction materials. The evaluation consisted of reviewing existing design information (including as-built drawings), field turf vendor data, and investigating (e.g. sampling with subsequent laboratory analysis) the synthetic turf field in the area of Fields #3 and #4. Details describing the tasks performed are described below.

3.1 Field Construction Review

AECOM worked with the Greenwich Department of Public Works, Rocco V. D'Andrea, Inc., the design engineer for the field construction, and Forever Green, the vendor who provided the artificial turf field materials and supported its installation to complete a desktop review of available documents to evaluate the construction and functionality of the field drainage system. This review included a review of available as-built construction drawings and details, review of the physical properties of the turf and subgrade material, and correspondence with the turf material supplier and the turf field installation firm. The as-built construction drawings for the turf fields and the drainage system details and specifications, provided by Forever Green, are provided as **Appendix B**. This also includes all the available information on the material specifications, and the cross-section design details for the Forever Green synthetic turf installations.

On review of the available documentation regarding the Site's artificial turf, the playing fields were constructed with five main layers listed below.

1. Synthetic Grass Turf – Pile Fibers
   - A parallel pattern slit film, 100% polyethylene fiber.
2. Crumb Rubber Infill
   - SBR Rubber – No less than 3.75 pounds per square foot installed to a minimum of 75% of the fiber height as the infill.
3. ForeverDrain Drainage Blanket – Core (formed polystyrene core covered on both sides with filter fabric) – approximately 0.5 inches thick.
   - The core provides a high compressive strength structure that allows water to flow to designated exits.
   - The sections of drainage mats are generally taped at the seams where adjacent sections of the mat abut each other.
4. ForeverDrain Drainage Blanket – Fabric (non-woven polypropylene filter fabric)
   - A heavy-duty filter fabric is present atop the drainage blanket core, and a lighter duty filter fabric is present underneath.
   - The filter fabric allows water to pass freely into the core while restricting any movement of rubber or other particles that might clog the core.
5. Compacted Stone Base
   - 100% fractured, by mechanical means, with elongated characters on each individual particle larger than ¼". Devoid of mineral fines. Approximately 4 to 6 inches thick.
6. Geotextile Membrane - Mirafi® 160N
   - Nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Mirafi® 160N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Field observations indicated that the ForeverDrain Drainage Blanket – Core is perforated (a photo log of the material is included in **Appendix B**) in all of the locations sampled on the artificial turf fields. The perforations are approximately 0.2 inches in diameter and when measured on a 1 x 1 foot square, represent about 3 percent of the surface area of the drainage mat. Field observations confirmed that the total thickness from the surface of the synthetic turf to the base geotextile membrane to be approximately 7 to 12 inches below Fields #3 and #4. The total thickness from the surface of the artificial turf to the base geotextile membrane beneath Fields #6 and #7 was observed to be approximately 7 inches. This variation is indicative of the range of thickness of the stone fill.

3.2 Artificial Turf Field Drainage

The artificial turf field is designed to manage precipitation and prevent ponding on the surface of the fields. Precipitation readily drains through the artificial turf grass layer and rubber infill to the drainage mat where excess water flows horizontally to perimeter drains and the remainder infiltrates the aquifer. The ForeverDrain fabric prevents the rubber infill from entering the ForeverDrain Core. The ForeverDrain Core is also referred to as the ‘drainage mat’ or ‘waffle drain’ and is composed of high-density polyethylene that has perforations that allow some infiltration of precipitation to the compact stone base.

Both the compact stone base below the perforations and the drainage mat are capable of redirecting water, based on their installed grades, toward the perimeter of the fields. The perforations represent only three percent of the surface area of the drainage mat, and due to the extremely high lateral permeability of the drainage mat relative to that of even coarse-grained soil, the drainage mat is believed to reduce infiltration directly below the fields by directing precipitation to the edges of the field, particularly during intense rain events when the infiltration capacity of the stone base underlying the limited perforations in the drainage mat is exceeded. Around the turf field, the ForeverDrain Core is open at the edges, allowing water to drain into the perforated drainage pipe and stone trenches that surround Field #3 on three sides, and Field #4 on all four sides. The compact stone base is also in communication with the gravel trenches, allowing water to drain from this layer to the trenches, when the infiltration capacity of the underlying fill material is exceeded. Water that flows horizontally to the drainage trenches and cannot infiltrate there is directed to two outfalls on West Brothers Brook via the perforated pipe.

Specifications indicate that the drainage mat is designed to be able to evacuate a minimum of 2.5 inches/hour precipitation from the field area in addition to any vertical infiltration capacity. This represents a storm with an average 50 to 100-year probability of occurring in the Greenwich area (NWS, 2019). Due to the high anisotropy in the material properties (i.e., the horizontal hydraulic conductivity of the drainage mat relative to the vertical hydraulic conductivity of the drainage mat, stone base, and fill material), it is expected that a large percentage of water derived from precipitation is diverted to the trench drains, with a smaller proportion allowed to infiltrate directly, at least during intense precipitation events.

3.3 Artificial Turf Sampling and Analysis

Previous sampling of the drainage mat identified PCBs at concentrations below 1 mg/kg in the drainage mat and aggregate base, which led to the agencies’ requesting additional sampling for information regarding the presence of PCBs in the turf field surface and subsurface layers.

In April and July 2018, AECOM sampled artificial turf materials from Fields #3 and #4 to assess whether PCBs had impacted turf field construction materials. Turf materials were sampled at 32 locations, shown on **Figure 9**, in accordance with TSCA protocols for sampling PCBs in porous materials, using cutting tools to remove the turf, weighing the material and containerizing the samples for transportation to the laboratory.

During the April 2018 sampling event, five distinct turf materials were sampled and analyzed at each location for PCBs via Soxhlet extraction. The five materials sampled were: the synthetic turf, ambient rubber infill, drainage blanket – fabric, drainage blanket – core, and the compacted stone base. After review of the analytical results from the March 2018 turf material samples, it was determined the drainage blanket – fabric and polyethylene core could be sampled, but not analyzed, as the data for those layers

indicated a low frequency of detection and were not expected to be necessary to make either long-term or near-term remedial decisions. During the July 2018 sampling event, samples were collected from three distinct turf materials: the artificial turf, rubber infill, and compacted stone base. A photo log of all five distinct turf materials sampled is provided in **Appendix B**. Analytical results of the turf materials from each sampling event were shared with the regulators as separate reports (AECOM, 2014, 2018a, 2018b, 2019). Copies of the 2018 and 2019 letter reports are also provided in **Appendix B**.

The analytical results of the April 2018 and July 2018 sampling showed that PCB concentrations were greater than 1 mg/kg in the crumb rubber samples from location AJ13, which is located at the southern end of Field #4. This result was delineated following TSCA Subpart N protocols, and the extent of PCB impacts at concentrations above cleanup standards was found to be confined to a 10-foot by 10-foot area. Because the crumb rubber is at ground surface, the Town performed an interim remedial action to remove portions of the synthetic turf and crumb rubber in the area of AJ13. The interim remedial action was performed on October 4, 2018 in accordance with 40 CFR 761.61(b), and the results of which were presented in a letter report (AECOM, 2019).

3.4 Runoff/Drainage Water Sampling

Turf field runoff monitoring was performed at the field drain outfalls following a storm event on September 26, 2018. Water was observed flowing from the downgradient outfall (see Field #3 Drainage Pipe on **Figure 2**) at a rate of 21 milliliters per minute (mL/min). Water was also observed flowing from the upgradient pipe, but due to the configuration of the outfall, the flow rate could not be measured.

Sampling results from the upgradient and downgradient locations are included in **Table 1**. PCBs were identified at low concentrations in samples collected from SW-UG-F4 (0.11 µg/L and SW-DG-F3 (0.018 µg/L).

Other attempts to sample the outfalls during rain events were made, but either the precipitation was insufficient to produce runoff or the antecedent water levels were sufficiently low that the bulk of the precipitation infiltrated the aquifer, and there was insufficient discharge from the outfall to collect a sample. For example, sampling was attempted following the October 10, 2017 storm event that produced 0.25 inches of rain in the 24 hours leading up to the observation when antecedent water levels at well MW-Y9 were over four feet below ground surface.

3.5 Ponded Water Sampling

On February 8, 2019, AECOM collected samples of puddles that formed on ground surface in the fenced-off area between Fields 2 and 3. The ponded water sample locations, which are depicted in **Figure 9,** were collected in areas of natural grass adjacent to the artificial turf Field 3. Soil in this area contains PCBs in surface soil at concentrations greater than 1 mg/kg but less than 4 mg/kg. No other areas of ponded water were observed in the vicinity of the AOC 1 at the time of sampling. Samples were collected from the deepest portion of the puddles using a polyethylene syringe. The samples collected, particularly the one located to the west, nearer the Y9 cluster, were somewhat turbid due to the shallow depth of the puddles and presence of soil entrained in the water.

Puddle water sample results are summarized in **Table 2**. PCBs were detected at concentrations below 0.027 µg/L (PW-Y9) and 0.017 µg/L (PW-Y15). However, the nature of the PCBs collected, tetra-, penta- and hexachlorobiphenyls is indicative of PCBs associated with suspended solids rather than dissolved PCBs. Groundwater samples at the site indicative of dissolved PCBs contain primarily mono-, di-, tri-, and tetrachlorobiphenyls, which preferentially dissolve from Aroclor mixtures due to their higher solubility and lower organic carbon partitioning coefficient, whereas the puddle sample results contain PCB homologues that are the primary homologues in the parent Aroclor that is found in soil samples. Detection limits were not elevated in the puddle samples. There was simply not enough of the lighter mono-, di-, and trichlorobiphenyls in the suspended solids to be detected in the puddle water samples, because the concentration of PCBs in surface soil is much lower than that in the deeper soil where dissolved PCBs have been observed in groundwater.

Groundwater elevation data in the area where the samples were collected indicate that the water table was approximately 1.3 to 4.3 feet bgs at the time of sampling.

4. Hydrogeologic Evaluation

A hydrogeologic evaluation was performed to further develop the CSM, specifically related to hydrogeologic conditions in the vicinity of Fields #3 and #4. The hydrogeologic investigation consisted of groundwater flow evaluation, deep groundwater quality assessment, a recharge assessment, and a groundwater-surface water exchange study. The investigation activities performed and data collected are described below.

4.1 Soil Borings / Groundwater Well Installation

Prior to invasive field activities associated with this phase of investigation, AECOM contacted Call-Before-You-Dig and precleared proposed boring/well installation locations with ground penetrating radar (GPR) and electromagnetic (EM) locator technology. The GPR and EM survey was subcontracted to New England Subsurface Imaging, LLC and was completed on June 23, 2017.

Six groundwater monitoring wells were installed between August 8, 2017 and August 11, 2017. Five deep monitoring wells (paired with existing shallow monitoring wells) were installed below the silt and peat wetland deposits that separate the fill from the underlying sandy till: MW-Y9D (screened 23-33 feet bgs), MW-AA12D (screened 20-30 feet bgs), MW-Y15D (screened 35-40 feet bgs), MW-AJ13D (screened 25-35 feet bgs), and MW-AM16D (screened 20-30 feet bgs). One shallow groundwater monitoring well, MW-AL10 (screened 2-12 feet bgs) was also installed at this time. An additional deep monitoring well, MW-AH16D, was installed on June 26, 2018. The Site monitoring well network is shown on **Figure 10** with corresponding boring logs and well construction logs provided as **Appendix C**. The monitoring wells were constructed of 2-inch diameter Schedule 40 PVC pipe with 10 feet of 0.010-inch slotted screen. All newly installed wells were developed after a minimum of 24 hours to a measured turbidity of approximately 5 NTUs. Purged groundwater was collected in a 55-gallon steel drum and disposed off-Site in accordance with applicable regulations. The deep soil borings were used to further refine the geology of the Site. Cross sections depicting the refined geologic model are included in **Figures 3 through 6**.

4.2 Groundwater Quality Sampling

The groundwater monitoring well network at the Site consists of 36 monitoring wells installed between 2011 and 2018. Groundwater monitoring at the Site has been conducted periodically since 2011; however, the groundwater data provided in this report focuses on six monitoring events conducted quarterly between April 2017 and September 2018. Previous groundwater monitoring results have been provided separately (e.g., AECOM, 2013b, AECOM, 2013d, AECOM, 2018c). AECOM performed groundwater monitoring using similar methods as described in the RI (AECOM, 2013c), which include low-flow sampling using a peristaltic pump and dedicated polyethylene tubing. Water quality parameters (e.g. temperature, pH, specific conductivity, turbidity, dissolved oxygen, and oxidation-reduction potential) were measured and recorded during well purging until parameters were considered stable. Groundwater was subsequently sampled and submitted to a DEEP approved laboratory for analysis. Groundwater samples were analyzed for the following constituents:

- PCBs as homologs by SW-846 Method 3510 and 680;
- PAHs;
- Connecticut 15 Metals; and
- Pesticides (only analyzed for during September 2018 event).

Chemical analyses performed on groundwater samples during the last six sampling events were selected based upon COCs detected in soil and historical groundwater sampling results.

Groundwater analytical results are presented in **Table 3** with results compared to the GWPC, SWPC, and R VC. Lab reports were provided in the annual groundwater progress report (AECOM, 2018c). The following is a summary of COCs identified in groundwater at the Site.

4.2.1 Distribution of Polychlorinated Biphenyls (PCBs) in Groundwater

Figures 11 through 16 display the concentrations of total PCBs detected at each monitoring well during each sampling event. PCBs have been detected at concentrations above RSR criteria in samples collected from the following wells:

- **MW-AH16R** - Installed in October 2015 and located within the AOC 1 fill area in an area where PCBs have been detected in soil at maximum concentrations over 1,000 mg/kg.
    - Total PCBs detected in groundwater at this location have exceeded the GWPC and SWPC in all six sampling rounds with a maximum concentration of 24.59 µg/L during the April 2017 event. Total PCBs detected during the other sampling events have ranged between 10 and 15 µg/L.
- **MW-AJ13** - Installed in June 2012 and located within the AOC 1 fill area beneath Field #4 within an area where PCB concentrations in soil have been detected in soil at concentrations up to 387 mg/kg and have been detected in adjacent borings at maximum concentrations over 1,000 mg/kg.
    - Total PCBs detected in groundwater at this location have exceeded the screening criteria in all six sampling rounds with concentrations ranging from approximately 2.6 to 6.3 µg/L.
- **MW-AJ13D** - Installed in August 2017 and located below the silt/peat layer beneath the AOC 1 fill area between Field #3 and Field #4.
    - MW-AJ13D was sampled in last five rounds of sampling and PCBs were detected during each event, with three results exceeding the GWPC and SWPC for total PCBs with a maximum concentration of 7.4 µg/L during the August 2017 event. Total PCBs detected during the other sampling events have ranged between 0.1 and 1.321 µg/L.
    - Total PCB concentration results were above the GWPC and SWPC, except during the March 2018 and September 2018 sampling events.
- **MW-AA12** - Installed in June 2012 and located within the AOC 1 fill area beneath Field #3 within an area where PCBs have been detected in soil at concentrations up to 856 mg/kg.
    - Four samples were collected at this location between April 2017 and September 2018, all of which contained PCB concentrations exceeding the GWPC and SWPC for total PCBs, with concentrations ranging from 0.51 to approximately 2.13 µg/L.
- **MW-Y15** - Installed in April 2012 and located within the AOC 1 fill area east of Field #3 within an area where PCBs have been detected in soil at concentrations of up to approximately 40 mg/kg and have been detected in adjacent borings at maximum concentrations over 1,000 mg/kg.
    - Total PCBs detected in groundwater at this location exceeded the GWPC and SWPC in all six sampling rounds with concentrations ranging from approximately 6.1 to 21 µg/L.
- **MW-AG10** – Installed in July 2012 and located within the AOC 1 fill area beneath Field #3 within an area where PCBs have been detected in soil at concentrations up to approximately 11 mg/kg and have been detected in nearby, upgradient borings at maximum concentrations over 1,000 mg/kg.
    - Total PCBs were detected in groundwater in all six samples collected at this location between April 2017 and September 2018, but concentrations exceeded the GWPC and SWPC only during the September 2018 event with a concentration of 0.52 µg/L.
- **MW-AM16** - Installed in February 2012 and located within the AOC 1 fill area between Fields #4 and #5 within an area where PCBs have been detected in soil at concentrations up to approximately 20 mg/kg.
    - Total PCB concentrations detected in groundwater samples from this location have ranged from 0.05 to 0.54 µg/L. Total PCB concentrations exceeded the GWPC and SWPC only during the September 2018 event.

The locations at which total PCBs exceed the SWPC and GWPC are all located within or immediately downgradient of the portion of the AOC 1 fill area where PCBs have been detected in soil at concentrations of over 1,000 mg/kg.

PCBs have been detected in the following monitoring wells but at concentrations less than the GWPC and SWPC:

- **MW-Y9** - Installed in April 2012 and located within the AOC 1 fill area between Fields #2 and #3.
    - Six groundwater samples were collected at this location between April 2017 and September 2018 and PCBs were only detected during the March 2018 and September 2018 events at concentrations of 0.0077 µg/L and 0.026 µg/L, respectively.
- **MW-Y9D** - Installed in August 2017 and located below the silt/peat layer beneath the AOC 1 fill area between Fields #2 and #3.
    - Five samples have been collected at this location, and PCBs were only detected during the September 2018 event at a concentration of 0.016 µg/L.
- **MW-V12** - Installed in June 2012 and located within the AOC 1 fill area in the outfield portion of Field #2.
    - Four samples were collected at this location, and PCBs were detected in all samples, with concentrations ranging from 0.065 to 0.45 µg/L.
- **MW-AA12D** - Installed in August 2017 and located below the silt/peat layer beneath the AOC 1 fill area between Fields #2 and Field #3.
    - MW-AA12D was sampled during the last five events, and PCBs were detected in all samples with concentrations ranging from 0.035 to 0.28 µg/L.
- **MW-Y15D** - Installed in August 2017 and located below the silt/peat layer beneath the AOC 1 fill area east of Field #3.
    - MW-Y15D was sampled during the last five events, and PCBs were detected in all samples, with a maximum concentration ranging from 0.0014 to 0.49 µg/L just below the screening criteria during the August 2017 event.
    - Following the August 2017, total PCB concentrations have decreased steadily over time. During the last two sampling events total PCB concentration have been detected at 0.1951 µg/L and 0.0014 µg/L, respectively.
- **MW-X17** - Installed in February 2012 and located within the AOC 1 fill area beneath the western parking lot and downgradient of the areas of highest PCB concentrations in soil.
    - Six samples were collected at this location between April 2017 and September 2018, and PCBs were detected in four samples with a maximum concentration of 0.321 µg/L detected during the November 2017 event.
- **MW-V18** - Installed in June 2012 and within the AOC 1 fill area beneath the western parking lot adjacent to West Brothers Brook.
    - Six samples were collected at this location between April 2017 and September 2018, and PCBs were detected in all samples with concentrations ranging from approximately 0.035 to 0.097 µg/L.
- **MW-S15** - Installed in December 2011 and located within the AOC 1 fill area near West Brothers Brook and east of Field #2.
    - Six groundwater samples, each with a duplicate pair, were collected at this location between April 2017 and September 2018, and PCBs were detected in all of the samples with concentrations ranging from 0.033 to 0.19 µg/L.

- **MW-P11** - Installed in June 2012 and located immediately south of the AOC 1 fill area and Field #2.
    - Six samples were collected at this location between April 2017 and September 2018, and PCBs were only detected in the samples collected in November 2017 and June 2018 at concentrations of 0.002 µg/L and 0.0043 µg/L, respectively.
- **MW-P7** - Installed in February 2012 and located southwest of the AOC 1 fill area and Field #2 adjacent to West Brothers Brook.
    - Six samples were collected at this location between April 2017 and September 2018, and PCBs were detected in the samples collected in November 2017 and June 2018 at concentrations of 0.049 and 0.004 µg/L, respectively.
- **MW-AE8** - Installed in February 2012 and located immediately west of the AOC 1 fill area between Field #2 and West Brothers Brook. Groundwater elevations observed in MW-AE8 have consistently been lower than in surrounding monitoring wells, suggesting that it is downgradient of the fill area (and upgradient of West Brothers Brook).
    - Six samples were collected at this location between April 2017 and September 2018, and PCBs were detected in five samples, with a maximum concentration of 0.187 µg/L observed during the November 2017 event.
- **MW-AL10** - Installed in August 2017 and located west of the AOC 1 fill area between Field #4 and West Brothers Brook.
    - Five samples have been collected at this location, and PCBs were only detected in the samples collected in August 2017 and September 2018 at concentrations of 0.019 µg/L and 0.0025 µg/L, respectively.
- **MW-AP11** - Installed in April 2012 and located west of the AOC 1 fill area between Field # 4 and West Brothers Brook.
    - Three samples were collected at this location between April 2017 and September 2018. PCBs were detected in all three samples with concentrations ranging from 0.003 µg/L to 0.0043 µg/L.
- **MW-AM16D** - Installed in August 2017 and located beneath the silt/peat unit below the AOC 1 fill area between Fields #4 and #5.
    - Five samples have been collected at this location, and PCBs were detected in all samples with concentrations ranging from 0.0012 to 0.063 µg/L.
- **MW-AJ19** - Installed in February 2012 and located within the AOC 1 fill area in the northern portion of the western parking lot.
    - Six samples were collected at this location between April 2017 and September 2018, and total PCBs were detected in three of the samples with a maximum concentration of 0.031 µg/L.
- **MW-AM21** - Installed in June 2012 and located within the AOC 1 fill area between Field #5 and the north end of the western parking lot.
    - Six samples were collected at this location between April 2017 and September 2018, and PCBs were detected in five samples with a maximum concentration of 0.0443 µg/L detected during the November 2017 event.
- **MW-AP28** - Installed in February 2012 and located on the eastern side of the property beneath the North Parking Lot.
    - Five samples were collected at this location between April 2017 and September 2018, and PCBs were only detected in the sample collected in June 2018 at a concentration of 0.0058 µg/L.

- **MW-BB34** – Installed in June 2012 and located on the eastern side of the property in the North Parking Lot.
    - Prior to MW-BB34 being paved over, four samples were collected at this location. Total PCBs were only detected in the sample collected in March 2018 at a concentration of 0.0012 µg/L.
- **MW-T23** - Installed in June 2012 and located to the west of the Sheldon/Folsom wing of the high school, approximately 90 feet northeast of the natural channel of West Brothers Brook (see **Figure 10**).
    - Six samples were collected at this location between April 2017 and September 2018, and PCBs were only detected in the sample collected in June 2018 at a concentration of 0.0013 µg/L.
- **MW-R20** - Installed in August 2017 and located southern bank of West Brothers Brook near the tennis courts.
    - Six samples were collected at this location between April 2017 and September 2018, with four collected with duplicate pairs. PCBs were detected in one of these samples, collected during the March 2018 event, at a concentration of 0.001 µg/L.
- **MW-28** -Installed in April 2012 and located on the southern property boundary between East Putnam Avenue and Cider Mill Pond.
    - Six samples were collected at this location between April 2017 and September 2018, and PCBs were only detected in the samples collected in August 2017 and November 2017 at concentrations of 0.016 and 0.022 µg/L, respectively.
- **MW-35** - Installed in June 2012 and located on the southeast corner of the property adjacent to Hillside Road.
    - Six samples were collected at this location between April 2017 and September 2018, and PCBs were only detected in the sample collected in August 2017 at a concentration of 0.0018 µg/L.
- **MW-AV17** - Installed in December 2011 and located north of the AOC 1 fill area west of Field #6.
    - Six samples were collected at this location between April 2017 and September 2018, and PCBs were only detected in one sample collected in September 2018 at concentration of 0.0063 µg/L.
- **MW-AG30** – Installed in June 2012 and located on the eastern side of the property within the parking lot adjacent to Hillside Road.
    - Six samples were collected at this location between April 2017 and September 2018, and PCBs were only detected in one sample collected in September 2018 at a concentration of 0.015 µg/L.
- **MW-AA19** – Installed in December 2011 in the western parking lot.
    - Six samples were collected at this location between April 2017 and September 2018, and PCBs were only detected in one sample collected in September 2018 at a concentration of 0.0011 µg/L.
- **MW-F35 -** Installed in June 2012 and located at the southeast corner of the property.
    - Six samples collected at this location between April 2017 and September 2018, and PCBs were only detected in one sample collected in September 2018 at a concentration of 0.013 µg/L.

PCBs were not detected at the following monitoring locations:

- **MW-Y26** - Installed in June 2012 in close proximity to the school buildings, near the pool area.
- **MW-L25** - Installed in June 2012 within the vicinity of the school buildings.

From the data collected to date for PCBs in groundwater, it is evident that dissolved phase PCB concentrations exceed applicable RSR criteria only in the central portion of the Site where PCBs are present in soil at concentrations of 1,000 mg/kg or greater. This area of impacts exceeding the groundwater screening criteria corresponds to the area where the highest soil concentrations of PCBs at

the Site are located, and the concentrations attenuate quickly with distance from the source area, due to the strong tendency for PCBs to sorb to aquifer solids, which retards their transport. PCBs are detected in groundwater below the screening criteria beyond this area but these impacts are limited to the Site.

4.2.2 Distribution of Polycyclic Aromatic Hydrocarbons in Groundwater

PAHs were analyzed in samples collected from six wells within the AOC1 fill area: MW-Y9, MW-AA12, MW-AJ13, MW-AH16, MW-Y15, and MW-S15. PAHs were detected in groundwater samples from all six monitoring wells. Other than the SWPC for phenanthrene for which an alternative criterion is available, PAH concentrations detected in groundwater were below GWPC and SWPC with the exception of well MW-AA12, where several PAHs exceed the GWPC.

PAHs were also analyzed in samples collected from wells MW-AE8 and MW-P7, both of which are located east of the West Brothers Brook and west of the AOC 1 fill area, well MW-AG30, which is located northeast of the science wing, and wells MW-28 and MW-35, which are located south and east, respectively, of Cider Mill pond. PAHs were not detected in the samples collected from these five wells.

4.2.3 Distribution of Metals in Groundwater

Groundwater analytical data for metals and recommended screening criteria for respective analytes are summarized in **Table 3**. The following is a summary of the analytical data for metals in groundwater at the Site:

Samples collected from the following monitoring wells contained metals at concentrations above laboratory reporting limits including six monitoring wells within the AOC1 fill area: MW-Y9, MW-AA12, MW-AJ13, MW-AH16R, MW-Y15, and MW-S15; two wells located east of the West Brothers Brook and west of the AOC 1 fill area, MW-AE8 and MW-P7; one well located northeast of the science wing, MW-AG30; and two wells located near the southeast corner of the property and Cider Mill Pond, MW-28 and MW-35.

Metals were reported at concentrations above the GWPC and SWPC in groundwater samples collected from monitoring wells: MW-35, MW-Y9, MW-AA12, MW-AJ13, MW-AH16R, and MW-S15.

Arsenic and zinc were reported at concentrations above RSR criteria most frequently in the groundwater samples collected between April 2017 and September 2018. Arsenic was detected at concentrations above the SWPC in samples collected from five wells (MW-35, MW-AH16R, MW-AJ13, MW-S15, and MW-Y9. All but MW-35, where arsenic was detected in only one of six groundwater samples collected between April 2017 and September 2018, are located in the AOC 1 fill area. Of these wells, wells MW-35 and MW-S15 are located nearest a discharge point to a surface water body. One sample, collected from well MW-AJ13 contained arsenic at concentrations above the GWPC.

Zinc was detected at concentrations above the SWPC in samples collected from three wells: MW-AA12, MW-AH16R, and MW-AJ13, all of which are located within the AOC 1 fill area and none of which are a well directly upgradient of a surface water body.

Barium and antimony were reported at concentrations above the GWPC for two samples each, collected from wells MW-AH16R and MW-Y9, both of which are within the AOC 1 fill area.

4.2.4 Distribution of Pesticides in Groundwater

Starting in September 2018, pesticides were added to the analytical list for seven monitoring wells: MW-28, MW-35, MW-AM16, MW-AV17, MW-S15, MW-Y15, and MW-Y9. Groundwater analytical data for pesticides and recommended screening criteria for respective analyte is presented in **Table 3**. All samples collected during the September 2018 event were non-detect for pesticides.

4.3 Infiltration and Runoff Evaluation

An infiltration and runoff evaluation was completed at the Site to assess the following:

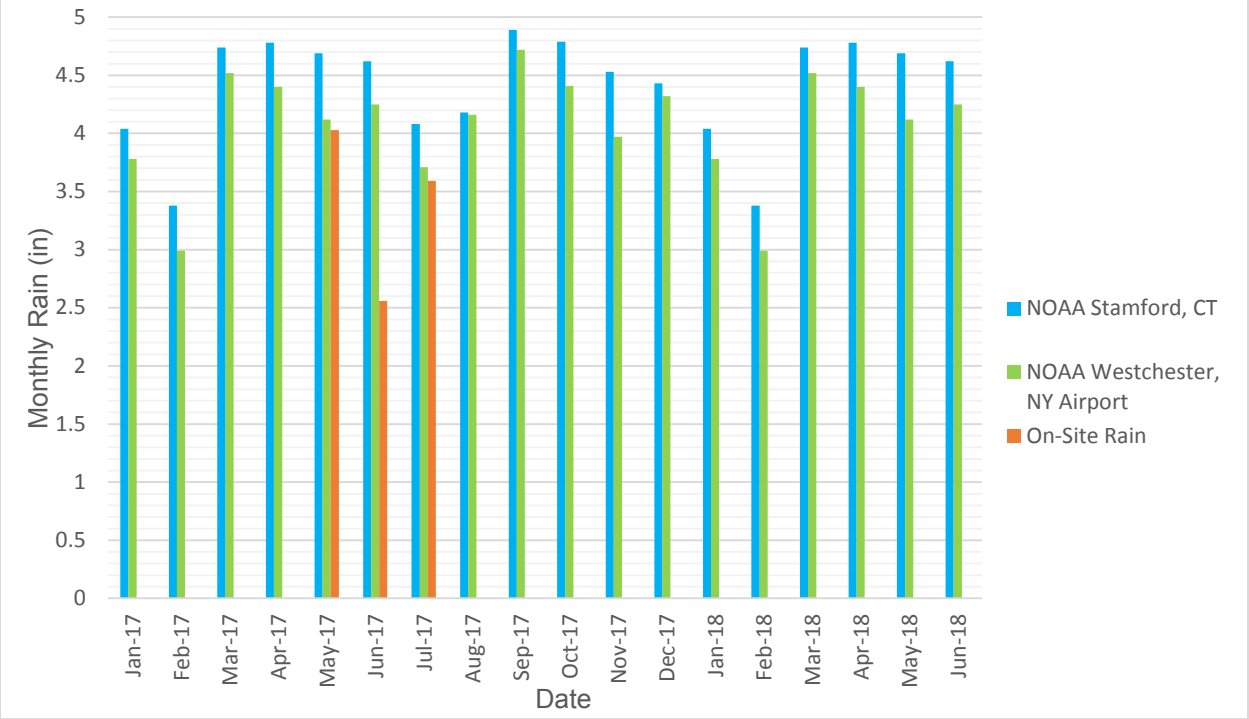
- Site-specific infiltration rates;
- The interaction of shallow groundwater and recharging precipitation; and
- Whether runoff might contain PCBs.

To complete the evaluation, infiltration testing was performed, stormwater runoff from the fields was sampled, and data from the weather and water-level monitoring program discussed in **Section 4.3.2** were evaluated.

4.3.1 Precipitation Monitoring

A precipitation gauge was installed on April 12, 2017 near Field #3 to continuously monitor precipitation events at the Site. The on-site gauge operated between April 12, 2017 and August 17, 2017, but suffered damage and could not continue to be operated. To supplement the on-site precipitation dataset, precipitation data was acquired from the nearby Westchester Airport located in Westchester County, New York (approximately six miles from the Site). Precipitation is plotted with continuous groundwater elevation time series data (**Appendix D**).

Annual precipitation for Greenwich averages approximately 53 inches per year (NOAA, 2019). From April 2017 through March 2018, 37.93 inches of rain fell, well below this average. Average monthly precipitation for Greenwich is plotted with monthly precipitation from the Westchester Airport during the study period, and where available, the on-site precipitation gauge and presented below.



As evident in the figure above, rainfall for April 2017 through July 2017 was similar to average whereas between August 2017 and January 2018, the monthly rainfall totals were below average with the exception of October 2017, where rainfall exceeded the monthly average. While there were monthly deviations between February and June 2018, the total precipitation during that time was close to average. Summaries of average monthly precipitation data are provided in **Appendix E**.

4.3.2 Infiltrations Tests

Infiltration and runoff is expected to differ between the natural fields (e.g. Field #2) without subsurface drainage capability and the synthetic turf fields which are engineered to divert water to perimeter drains and outfalls in addition to allowing infiltration. The artificial turf fields cannot be tested by conventional infiltration tests without damage, but they have designed water-handling capacities that are understood to be far greater than that of native soil.

To assess recharge rates, infiltration tests were performed in the area between Fields #2 and #3, and between Fields #4 and $5. The locations of the infiltration tests are shown on **Figure 9**. Details describing the infiltration testing are provided in **Appendix F**.

Infiltration rates are variable across the Site due to a number of factors including surface cover, compaction, near-surface water content, and other factors that influence the texture and physical properties of the soil. Observed infiltration rates indicate the shallow vadose zone is able to readily accept recharge without appreciable amounts of runoff occurring during normal precipitation events. However, over time, the infiltration capacity of the soil declines. Thus, if a precipitation event's total precipitation and/or rainfall intensity overcome the capacity of the soil to accept additional water, then ponding can occur and, for precipitation that falls onto the artificial fields, discharge through the curtain drain/drainage pipes occurs. Where Field #3 drains to the south, there is no curtain drain, so runoff from the southern end of Field #3 combines with rainfall in the low-lying area between Fields #2 and #3, and thus ponding is periodically observed.

4.3.3 Recharge evaluation results

The infiltration process occurring at the Site is dependent on whether the precipitation falls over the natural fields or synthetic fields. When precipitation falls over the synthetic fields, the drainage layers are equipped to handle rain events up to 2.5 inches per hour, which is equivalent to a once per 50 to 100-year 1-hour rain event (NWS, 2019), and much of the rain water is diverted laterally from the fields to perforated perimeter drainage pipes, in addition to water that may infiltrate the subsurface through the partial perforations in the drainage mat. The drainage mat and perimeter pipes allow additional recharge to occur in the shallow subsurface due to the perforations in the pipe and the stone base. Field construction diagrams are provided in **Appendix B**. In the vicinity of Field #2 and other grassy areas, infiltration and recharge rates are limited by natural infiltration and vadose zone processes and are understood to be much lower.

AECOM conducted multiple Site visits during storm events and groundwater sampling events between April 2017 and December 2018. The only occasion when runoff was observed to be exiting the drain pipes at the outfalls into West Brothers Brook was during October 2018. The remainder of the times that the pipes were observed, there was no discharge, indicating that rainwater was able to infiltrate the aquifer without runoff. It is likely that the infiltration capacity of the fields is controlled more by the antecedent water level before a storm event than the intensity of the storm event, and therefore, runoff may have occurred during wet season rainfall on occasions when the outfalls were not being inspected.

Samples of the stormwater discharge were collected in October 2018 for chemical analysis. These results are discussed in **Section 3.4**.

4.4 Groundwater Elevation Evaluation

The focus of the investigation was to further evaluate hydrogeologic conditions at the Site to refine elements of the CSM, particularly the understanding of the groundwater "mound" (a relatively stable condition of a locally elevated water table) observed beneath portions of Fields #2 and #3, the potential for water table to rise in response to precipitation, and fate and transport mechanisms for PCBs and other contaminants in groundwater. To this end, several field tasks were completed to provide additional information related to Site-specific hydrogeological conditions at the Site.

4.4.1 Site-Wide Groundwater Elevations

As part of each quarterly groundwater monitoring event, synoptic groundwater level measurements were collected from the Site-wide monitoring well network. Manual groundwater level measurements were collected in April 2017, August 2017, November 2017, March 2018, June 2018, and September 2018. The April 2017 gauging event was limited to shallow monitoring wells, because the deep overburden wells were not installed until August 2017. The five monitoring events performed between August 2017 and September 2018 involved the measurement of water levels at both shallow and deep monitoring wells. Quarterly groundwater elevations calculated from manual groundwater level observations are presented in **Table 4**.

Figures 17 through 27 depict interpreted groundwater elevation contours for each monitoring event for the shallow and deep portions of the aquifer. Contours were generated using ArcGIS Geostatistical Analyst and refined manually by an AECOM hydrogeologist. The primary direction of groundwater flow on Site is to the south-southeast. Groundwater enters the Site from upland areas to the north, west, and northeast. Shallow groundwater elevations in the area of Field #3 have been observed to be higher relative to other portions of the Site during each monitoring event. This raised groundwater elevation is indicative of the restriction on discharge out of this area, caused by the concrete culvert containing West Brothers Brook

Shallow groundwater on-site flows toward the engineered channel of West Brothers Brook and toward the southeast corner of the Site. Groundwater contours and the direction of groundwater flow have been generally consistent throughout the monitoring period, suggesting limited seasonal variability of groundwater flow direction. Localized groundwater flow (both lateral and vertical) is influenced by the depth of both the non-native fill materials and the thickness of the peat and organic silt materials associated with the former wetland deposits and is likely affected by the stream channels that were historically present within the former wetland at the Site.

Based on the deep monitoring well data, seasonality in groundwater flow in the deep portion of the aquifer is not evident, although the November 2017 contours differ from those from other monitoring events. Groundwater elevation data from the deep portion of the aquifer generally implies a flow direction to the south and southeast.

4.4.2 Continuous Groundwater Elevation Measurements

To further evaluate groundwater elevations relative to transient hydrologic events (e.g. precipitation, stream stage variability) and variability in vertical hydraulic gradients and to better understand the nature of the elevated hydraulic head in area of Field #3, long-term water level monitoring of the nested shallow and deep monitoring wells was completed using automated pressure transducers. Prior to the construction of the deep monitoring wells, nine *Solinst© Levelogger* pressure transducers were installed on April 12, 2017 into shallow groundwater monitoring wells MW-Y9, MW-AE8, MW-Y15, MW-S15, MW-AG10, MW-AA12, MW-AJ13, MW-AM16, and MW-AH16R. The shallow pressure transducer network operated until October 16, 2017 when the transducer network was reconfigured, following installation of the deep monitoring wells. Some of the pressure transducers were then relocated to nested well pairs (shallow/deep monitoring well couplets) to monitor vertical variations on groundwater potentiometric surface measurements. The locations of monitoring wells containing pressure transducers are shown on **Figure 10**. The pressure transducer network continues to operate at the Site.

A barometer was installed above the water level in one well (MW-AJ13) to record barometric changes and to correct for the influence of atmospheric pressure on the automatic water level recordings. The groundwater elevation data has been downloaded quarterly since installation and is calibrated to manually gauged water level measurements taken as part of the groundwater monitoring program during quarterly sampling events (during which time the transducers are temporarily removed to allow the performance of groundwater sampling). Plots of the long-term time series of groundwater elevations are provided as **Appendix D**. Each plot includes hourly precipitation recorded in nearby Westchester County, New York (approximately six miles from the Site). Vertical gradients were calculated for well couplets. The time series of vertical gradients are also included in **Appendix D**. The time series of groundwater

elevations and vertical gradients were evaluated relative to precipitation events to understand the response of groundwater elevations to the size and scale of single and successive precipitation events, and seasonal influence. When plotted with precipitation, continuous water level recordings for shallow monitoring wells indicate a rapid response to precipitation events when compared to their deep monitoring well pair. However, the magnitude of the response at the deep wells tends to be greater, suggesting that recharge to the deep aquifer beneath the fields occurs remotely (e.g., via discharge from or along the bedrock surface).

Further evaluation of response in the shallow aquifer to precipitation events is included in Section 4.4. Shallow monitoring wells MW-Y9, MW-AA12, MW-Y15, MW-AJ13, and MW-AM16 are all primarily screened within non-native fill, which extends 2.5 – 28 feet bgs and portions of the native peat in the area of the athletic fields. Installed deep monitoring wells are screened within silty/sandy till beneath the peat layer, which extends 8.5 – 28 feet bgs.

The following sections describe the long-term patterns in groundwater elevation observed in each shallow and deep monitoring well pair and the average vertical hydraulic gradient and average gradient direction between the two from October 2017 to June 2018:

MW-Y9 & MW-Y9D

Well	Reference Elevation (feet MSL)	Average Groundwater Elevation (feet MSL)	Minimum Groundwater Elevation (feet MSL)	Maximum Groundwater Elevation (feet MSL)	Average Vertical Gradient (feet/foot)	Hydraulic Vertical Gradient
MW-Y9	51.47	49.50	46.73	51.67	0.22	Downward
MW-Y9D	51.71	44.92	43.78	48.26	-	

The MW-Y9 well couplet is located in a grassy area north of Field #2 and south of Field #3, on the western side of the Site near West Brothers Brook. As shown in the table above, the average vertical gradient is 0.23, indicating a downward gradient between the well pair. The vertical component of the hydraulic gradient was consistently downward during the monitoring period.

MW-AA12 & MW-AA12D

Well	Reference Elevation (feet MSL)	Average Groundwater Elevation (feet MSL)	Minimum Groundwater Elevation (feet MSL)	Maximum Groundwater Elevation (feet MSL)	Average Vertical Gradient (feet/foot)	Hydraulic Vertical Gradient
MW-AA12	53.65	48.16	47.58	52.47	0.14	Downward
MW-AA12D	53.93	45.10	43.90	48.00	-	

The MW-AA12 well couplet is located beneath the artificial turf on the south end of Field #3. The vertical component of the hydraulic gradient was consistently downward during the monitoring period.

MW-Y15 & MW-Y15D

Well	Reference Elevation (feet MSL)	Average Groundwater Elevation (feet MSL)	Minimum Groundwater Elevation (feet MSL)	Maximum Groundwater Elevation (feet MSL)	Average Vertical Gradient (feet/foot)	Hydraulic Vertical Gradient
MW-Y15	57.58	46.18	44.84	47.03	0.050	Downward
MW-Y15D	51.47	44.78	43.75	47.26	-	

The MW-Y15 well couplet is located in a grassy area north of Field #2 and southeast of Field #3. The vertical component of the gradient was downward, except for a brief period following a precipitation event in April 2018, when groundwater elevation dropped slightly faster (over the course of one to two days) in the shallow aquifer than the deep aquifer. Typical of most well couplets, the generally downward vertical component of the hydraulic gradient decreased following precipitation events.

MW-AJ13 & MW-AJ13D

Well	Reference Elevation (feet MSL)	Average Groundwater Elevation (feet MSL)	Minimum Groundwater Elevation (feet MSL)	Maximum Groundwater Elevation (feet MSL)	Average Vertical Gradient (feet/foot)	Hydraulic Vertical Gradient
MW-AJ13	53.79	45.15	43.74	48.75	0.0015	Downward
MW-AJ13D	53.65	45.12	43.74	48.49	-	

The MW-AJ13 well couplet is located beneath the center of artificial turf Fields #3 and #4. The vertical component of the hydraulic gradient is on average, weakly downward. The weak gradient between the shallow and deep aquifer suggests a greater degree of connection between the two in this area. This is consistent with the boring log for well MW-AJ13D, which indicates that there is no peat separating the deep from the shallow aquifer in this location.

MW-AM16 & MW-AM16D

Well	Reference Elevation (feet MSL)	Average Groundwater Elevation (feet MSL)	Minimum Groundwater Elevation (feet MSL)	Maximum Groundwater Elevation (feet MSL)	Average Vertical Gradient (feet/foot)	Hydraulic Vertical Gradient
MW-AM16	53.46	46.14	43.20	49.33	0.05	Downward
MW-AM16D	53.46	45.35	43.76	48.99	-	

The MW-AM16 well couplet is located in a grassy area between Fields #4 and #5. The vertical component of the hydraulic gradient in this area is generally downward.

4.4.3 Shallow Groundwater Elevation Analysis

Shallow groundwater elevations were reviewed to evaluate whether the groundwater elevation approached ground surface during the study due to precipitation events. The table below provides summary statistics for the shallow monitoring wells. As above, comparison is made to the measuring point elevation (top of well casing), which is generally two to four inches below ground surface.

Well	Summary Data Start Date	Summary Data End Date	Well Reference Elevation (feet MSL)	Average Groundwater Elevation (feet MSL)	Minimum Groundwater Elevation (feet MSL)	Maximum Groundwater Elevation (feet MSL)
MW-AH16R	4/12/2017	10/16/2017	48.57	47.66	46.31	48.41
MW-AG10	4/12/2017	10/16/2017	52.87	48.37	47.36	49.95
MW-AE8	4/12/2017	10/16/2017	51.99	45.05	44.30	46.78
MW-AA12	4/12/2017	6/26/2018	53.65	48.39	47.50	52.47
MW-Y15	4/12/2017	6/26/2018	57.58	46.13	44.61	47.03
MW-Y9	4/12/2017	6/26/2018	51.47	49.32	44.45	51.67
MW-V12	4/12/2017	10/16/2017	53.30	44.50	43.33	53.33
MW-S15	4/12/2017	10/16/2017	52.43	44.34	43.58	45.94
MW-AM16	4/12/2017	6/26/2018	53.46	45.78	43.20	49.33
MW-AJ13	4/12/2017	6/26/2018	53.79	44.95	43.74	48.75

During the period of observation, the pressure transducers recorded maximum groundwater elevation that exceeded the reference elevation at well MW-Y9 which is located north of and Field #2. The transducer for one additional well, MW-AH16R, recorded a maximum groundwater elevation that came to within two inches of the measuring point elevation. The transducer for shallow well MW-V12 also recorded water levels near the top of the well casing, but that is believed to be related to a leaking well cap.

The water level in well MW-Y9 exceeded the reference elevation of 51.47 feet MSL on March 2018 (3/3/2018) for about 10 hours during a precipitation event before continued infiltration of rain water allowed the water table to decline. Well MW-Y9 is located in an area where ponded rain water has been observed in the past, and this high groundwater elevation is indicative of the ponded water having reached the local infiltration capacity and generated saturated conditions throughout the subsurface in that area. Leading up to this event, several successive rain events contributed to a nearly two inches greater rain than the monthly average in February 2018, followed by a single precipitation event on March 2, 2018, during which two inches of rain fell over the course of a 17-hour storm. This intensity of rainfall, while high, occurs at least once during most years, although it does not always fall when the ground is already saturated, as was the case on March 2, 2018. The groundwater elevation at well MW-Y9 was less than one foot below the reference elevation during late February and early March 2018, and episodically between April and June 2017 and April and early February 2018.

While water levels recorded at well MW-AH16R never reached the top of the casing, the water level was less than one foot below the reference elevation from late April through early August 2017. Water levels were not recorded at this location after October 2017, when the transducer was moved to a newly installed deep well. Well MW-AH16R is located at the western edge of the Western Parking Lot.

Other locations where the maximum groundwater elevations were less than five feet below their respective reference elevations include wells MW-AA12, MW-AG10, and MW-AM16. These maximum water levels were recorded during storm events and were not sustained near ground surface. Water levels at all other locations were greater than five feet below ground surface.

Water levels at well MW-V12 exceeded the reference elevation of 53.3 feet MSL twice in May 2017, each time for about 30 minutes (i.e., two readings). Based on the short duration of the high elevation groundwater and the fact that water levels were more than seven feet bgs prior to the rain events, it was concluded that rainwater was infiltrating into the well, raising the measured water level in the well much

higher than the surrounding water table. The short term temperature changes recorded during these rain events are also indicative of warmer water from the surface draining into the wells.

The two areas where groundwater elevations approach ground surface are the grassy area between Field #2 and artificial turf of Field #3 and the northwestern corner of the Western Parking Lot. The shallow groundwater observed at well MW-Y9 is located on the only side of the artificial turf fields where a drain is not installed. Runoff from the field drainage mat may contribute to the ponding that is sometimes observed in this area. The shallow groundwater near the Western Parking Lot is in a relatively low-lying area that can receive runoff from the parking lot, as well as direct infiltration from the earthen area present between the artificial turf fields and the parking lot.

4.4.4 Hydraulic Conductivity

Hydraulic conductivity (K) was measured in the monitoring well couplets at the Site by executing rising head slug tests on both shallow and deep monitoring well couplets (MW-Y9/MW-Y9D, MW-AA12/MW-AA12D, MW-Y15/MW-Y15D, MW-AJ13/MW-AJ13D, and MW-AM16/MW-AM16D). Rising head tests were completed using a solid PVC slug. No water was generated during testing. The Solinst© pressure transducers were launched to capture the subsequent water-level response (displacement or change from static) measured over time. Slug tests were repeated up to three times at each well to evaluate repeatability of the results. Shallow aquifer slug tests results were analyzed according to the Bouwer and Rice (Bouwer and Rice, 1976) method using AQTESOLV (Version 4.50 – Professional), which is appropriate for unconfined, partially penetrating wells such as those found at the Site. The deep aquifer slug test results were analyzed using the Bouwer and Rice (Bouwer and Rice, 1976) confined aquifer solution. Results from the AQTESOLV outputs are included in **Appendix G**. Hydraulic conductivity values from each well are summarized on **Table 5**.

Hydraulic conductivity within the shallow aquifer ranged from less than 4 feet per day to more than 29 feet per day with a response too fast to quantify at well MW-AA12. Values for hydraulic conductivity within the deep aquifer ranged from less than 3 feet per day to more than 183 feet per day. This high result is at well MW-AA12D, which is the same where the highest hydraulic response was observed in the shallow aquifer (i.e., at well MW-AA12). The next highest result in the deep aquifer was 23 feet per day at well MW-AM16D. Thus, the hydraulic conductivity of the shallow and deep aquifers are comparable. Aquifer parameters are typically log normally distributed; therefore, the geometric mean was used to calculate a representative hydraulic conductivity for both the shallow and deep aquifers. These values are presented in the following table:

Geometric Mean - Hydraulic Conductivity

Aquifer	Geometric Mean (cm/s)	Geometric Mean (feet/day)
Shallow	4.9E-03	14
Deep	5.4E-03	15

4.5 Groundwater - Surface Water Exchange Evaluation

AECOM performed a groundwater discharge study to assess the potential for groundwater to enter West Brothers Brook, particularly near the groundwater plume in the vicinity of Fields #2, #3, and #4. The discharge study included thermal imaging methods to evaluate the spatial distribution of groundwater inputs, manual stream gauging, and elevation measurements

4.5.1 Thermal Infrared Survey

On February 16 and 17, 2017 AECOM performed a thermal infrared survey along an approximately 500 linear foot reach of West Brothers Brook adjacent to Fields #2, #3, and #4. A Forward Looking Infrared

(FLIR) thermal imaging camera was used to inspect the stream channel for thermal anomalies suggestive of groundwater discharge. This technique depends on temperature difference between groundwater and surface water manifesting as an infrared anomaly where groundwater enters the stream. The time of year (February) was chosen to perform the survey due to the groundwater and surface water temperatures having the greatest contrast (i.e., groundwater being relatively warm in contrast to cold surface water, which is reflective of cold winter air temperatures), and the warmer groundwater is buoyant relative to surface waters (Hare et al., 2015). The method is a rapid reconnaissance tool that provides qualitative information of groundwater discharge along portions of the stream. The FLIR imaging method relies on adequate groundwater discharge to visualize thermal anomalies. The method does not provide quantitative measurements of the amount of discharge occurring and can be affected by water that has a textured/flowing water surface, reflection from the sun, or shadows from surficial features. Thermal imagining may be thought of as a screening approach to identify focused areas/locations of groundwater discharge. To complete the survey, the stream was viewed on each bank with a focus in imaging cracks and seams in the concrete channel.

The results from the thermal survey were used to develop multiple manual stream gauging transects to assess net groundwater gain/discharge along the length of West Brothers Brook. The locations of thermal anomalies detected during the survey are shown on **Figure 28**, and examples of FLIR images capturing thermal anomalies are presented as **Appendix H**. A portion of the natural stream channel immediately downstream of the concrete channel could not be effectively photographed due to the height and steepness of the banks and the density of vegetation there.

4.5.2 Shallow Groundwater and Stream Gradients

Long-term groundwater and surface water levels were recorded at the Site using pressure transducers. The locations of the wells with pressure transducers are shown on **Figure 10**. Water level data collected were used to evaluate surface water elevations in relation to groundwater levels and precipitation. **Appendix D** contains time-series plots of both groundwater and surface water elevations. In addition, groundwater contours (**Figures 17 through 27**) generated from manual groundwater gauging depict Site-wide groundwater elevations and overall flow direction.

Throughout the monitoring period, Site-wide groundwater elevations have consistently remained higher than surface water elevations, indicating the groundwater elevation gradient is primarily towards the surface water channel of West Brothers Brook. The upper portion of West Brothers Brook throughout the Site is underlain by a concrete channel and therefore the flow of groundwater into West Brothers Brook along this section is not expected to be a major contributor to overall stream flow. Groundwater contours on the west side of the Site and FLIR anomalies do indicate minor groundwater discharge seeps through visible cracks in the concrete channel, indicating that groundwater maintains a higher hydraulic head than West Brothers Brook. The amount of discharge from one medium to the other is considered to be low.

5. Data Usability Evaluation

During each monitoring event, attempts to collect samples from each monitoring well at the Site were made; however, various circumstances have affected our ability to collect samples from some wells on occasions during the monitoring period. The occasions where samples could not be collected do not affect the utility of the dataset for characterization of groundwater at the Site.

Analytical sample analysis and validation of data followed the Reasonable Confidence Protocols (RCPs). The RCPs (DEEP, 2007) require that the laboratories include a case narrative in the report that details all Quality Assurance/Quality Control (QA/QC) non-conformances that may have occurred during sample shipping, receipt, processing, and analysis. Each analytical report case narrative was evaluated by AECOM's validation staff with regard to any potential impacts to the sample data. The QC criteria specified in the RCPs was used to evaluate this information. This review relied upon the laboratory completely narrating all RCP non-conformances for 90% of the samples. Because the RCPs are prescriptive regarding approach to the analytical method, AECOM's validation staff reviewed 10% of the analytical reports, focusing on the QC results specified as a laboratory report deliverable in the RCPs ensuring the laboratory appropriately followed the required RCP methods and reporting data. The method-specific QC criteria specified in the RCPs was used to evaluate the analytical reports. These method-specific QC results included method blanks, laboratory control samples, matrix spikes, matrix spike duplicates, and/or surrogates, which are summarized on Data Usability Evaluation (DUE) worksheets and are provided as **Appendix I**.

As noted on the worksheets, the water quality data obtained during this investigation are considered usable for assessing compliance, evaluating the relationships between soil and groundwater quality, and making remedial decisions.

6. Conceptual Site Model Update

Based on the results of the hydrogeological investigation, several updates to the CSM have been made and are presented below. For the purpose of this report, the updates are primarily focused on the Fields #2, #3 and #4 areas.

6.1 Potential Source Areas

Prior to 1966, most of the Site was undeveloped, aside from approximately 12 residential dwellings, which were located along Putnam Avenue, along Hillside Drive, and along the northern side of the portion of West Brothers Brook near Cider Mill Pond. Historical maps of the property depict wetlands located in central portions of the Site. The Town of Greenwich purchased the property in 1966 and commenced construction of the high school. According to historical records obtained from the Town of Greenwich, the brook was diverted and fill material, obtained from an off-Site source, was used for filling and grading the Site. This fill material was not designated for use elsewhere at the Site.

The fill material is the primary source of chemical impacts at the Site. COCs identified in the fill include PCBs, VOCs, ETPH, PAHs, and metals. Pesticides have also been identified in the fill area. However, pesticide impacts identified are primarily associated with surface soil and are not inherent to the fill material brought to the Site.

6.2 Groundwater Flow

The Site is surrounded by elevated land features and bedrock outcrops. The bedrock surface beneath the Site forms a bowl-like structure in which a wetland complex formed with fine-grained sediments and plant materials accumulating into a peat layer over time. **Figure 7** shows a historical aerial photo from 1934, **Figure 8** depicts a topographic contour map from 1951, both of which depict conditions before the fields were constructed. The aerial shows several channels in the wetland complex that appear to act as headwater-like groundwater discharge zones , adjacent to upland areas, and a main channel bisecting the wetland complex (i.e. West Brothers Brook prior to its relocation), which acts as the main historic drainage feature for the wetland complex. Groundwater appears to have primarily recharged the Site from the topographic highs to the west and east. Fill materials were placed over the headwater channels and the former West Brothers Brook channel to build Site recreational facilities. Based on groundwater contours from the well network installed at the Site, groundwater recharge still occurs from the area of the former headwaters (see, e.g., MW-Y9 on **Figure 29**).

Groundwater recharge also occurs as precipitation infiltrating portions of the Site. A portion of the precipitation falling onto Fields #3 and #4 is diverted to perforated perimeter drains, with additional infiltration through perforations in the drainage mat. The drains are connected to the shallow aquifer and recharge shallow groundwater around the fields. Diverted precipitation that does not infiltrate the shallow groundwater below the field and perimeter drain flows to two outfalls into West Brothers Brook. Field #2 is subject to natural recharge conditions, where precipitation infiltrates into the shallow aquifer.

Elevated groundwater in the vicinity of Fields #2, #3, and #4 have been sustained since groundwater monitoring began at the Site in 2011. This feature is consistent with static hydraulic conditions occurring through successive seasons under differing weather conditions. Centered on the southwestern portion of Field #3, the highest groundwater elevations on-site are typically measured at monitoring wells MW-Y9, MW-AA12, and MW-AG10 (in declining order of typical groundwater elevation). Such locally elevated groundwater conditions can be indicative of a source of recharge to groundwater (e.g., connection to an elevated surface water feature, increased infiltration locally, connection to an underlying confined aquifer) or by spatial variations in hydraulic conductivities (e.g., localized low hydraulic conductivity deposits, buried drainage features). Each of these factors is believed to contribute to the elevated groundwater conditions in the area of Field #3.

Monitoring well MW-Y9, where the highest groundwater elevations are consistently measured, is located in an area where there was previously a headwater stream in the former wetland, likely due to recharge

from the western topographic high, which can provide both surface water runoff and discharge from the confined bedrock aquifer at the toe of the slope.

As evident in **Figures 7 and 29**, this stream channel was not connected in the upstream direction to West Brothers Brook; rather, it originated at the base of the bedrock hillside located on the western side of the Site. Given the hydrogeology of the subsurface beneath the fields, wherein the unconsolidated aquifer occupies a bedrock bowl with upland bedrock present (except to the southeast), the presence of the headwaters stream suggests that groundwater may discharge from bedrock in this area.

Discharge from the upland bedrock would result in an elevated head condition, such as observed at the Site. In addition, as depicted on Cross Section C-C' (**Figure 6)** the fill material extends to the eastern boundary of the athletic fields and, where present, the peat acts as a hydraulic barrier beneath the fill material, resulting in elevated groundwater levels in the areas of the former stream channels (Fields #2 and #3).

Lastly, elevated groundwater conditions are centered at the portion of the fields located furthest from the natural discharge locations. The stream channels that crossed the property prior to the construction of the artificial turf athletic fields provided natural drainage to the historic wetland and now to recharging groundwater. **Figure 29** depicts the relationship between the former surface water features and the groundwater potentiometric surface contours from August 2017. With the filling of these drainage channels and the relocation of West Brothers Brook to the concrete culvert that bounds Fields #3 and #4 on the west and Field #2 on the west, south, and east, the primary pathway for groundwater discharge to surface water was obstructed by the relatively low permeability concrete culvert around the relocated West Brothers Brook and by several hundred feet of fill in place of the former drainage channels. The hydraulic head in these areas is therefore elevated by the more constrained hydraulic outlets available.

Two of the wells with elevated groundwater potentiometric surface measurements, MW-Y9 and MW-AA12 are located at the southern end of Field #3. This area is lower-lying than the surrounding Fields #2 and #3 and receives runoff from the Field #3 drainage blanket, and it is along the only edge of the artificial turf fields where there is no curtain drain to discharge excess water to surface water. Puddles are observed in this area, which is indicative of limitations on groundwater infiltration capacity. PCBs are not consistently detected in groundwater at well MW-Y9, and when they are, the concentrations are an order of magnitude below the GWPC and SWPC.

Monitoring well MW-Y9D was installed to be paired with shallow monitoring well MW-Y9 to further assess the nature of the elevated hydraulic head. A plot of groundwater elevations for both MW-Y9 and MW-Y9D (**Appendix D**) depict that groundwater levels in MW-Y9D are consistently lower than its shallow well couplet MW-Y9, reflecting a steep vertical downward gradient (0.23) between shallow and deep portions of the aquifer. Monitoring well MW-Y9 is constructed to 12 feet bgs and is screened within non-native fill and native peat from 2 – 12 feet bgs. The peat layer separates MW-Y9 (constructed in the fill) and MW-Y9D which is constructed to 33 feet bgs (bedrock refusal) and is screened within sandy till from 23 – 33 feet bgs. Given the absence of drainage pipe south of Field #3 and the steep vertical hydraulic gradient across the shallow native peat material, precipitation events likely exacerbate elevated groundwater levels in this area.

Where less groundwater recharge occurs beneath the artificial fields, shallow well couplets indicate a groundwater elevation that is more closely aligned with the groundwater elevation in deep portions of the aquifer (e.g. MW-AJ13 and MW-AJ13D) and vertical groundwater gradients are smaller between the shallow and deep portions or sometimes reverse under certain conditions. These locations may allow communication between the shallow and deep portions of the aquifer, because the peat layer thins or is absent, as at the MW-AJ13 well couplet. Groundwater elevations beneath the artificial turf fields are generally several feet below ground surface.

Shallow groundwater elevation contours indicate groundwater flow parallels the historic wetland channels. While steep gradients exist between the shallow aquifer and the culverted portions of West Brothers Brooks, indicating resistance to groundwater flow, the gradient on the eastern portion of the fields generally follows the southeasterly orientation of the historic location of West Brothers Brook that bisects

the fields. The former channels represent areas where peat deposits are thinner and, thus, were filled with more permeable fill, that likely acts as a drain promoting flow to the southwest toward the existing natural channel of West Brothers Brook to the southeast.

Deep groundwater has a weak horizontal gradient that is generally north and north-northwest to south and south-southeast. With a minimal difference between shallow and deep aquifer gradients in some locations beneath the fields, and a switch of the hydraulic gradient during some precipitation events, communication between the shallow and deep portions of the aquifer occurs in some localized places allowing shallow water to enter the deeper portion of the aquifer. With bedrock becoming ever shallower in the southerly direction and peat deposits being absent, deep groundwater likely discharges toward the surface water bodies to the southeast along with shallow groundwater.

6.3 Chemical Fate and Transport

The potential migration pathways that were evaluated as part of the CSM development included:

- Leaching of chemicals from impacted soils into groundwater,
- Groundwater transport through natural soil, fill and subsurface conduits, and
- Transport to surface water.

In addition to the potential migration pathways, the mobility of chemicals through the environment depends on physical properties of the chemical (solubility in water, volatility, etc.), as well as properties of the media (soil permeability, pH of groundwater, etc.).

6.3.1 Leaching of PCBs in Soil to Groundwater

During and following precipitation events, a portion of the stormwater run-off generated during the event is absorbed and infiltrates into the ground. As water percolates through impacted soil, chemicals may leach from the unsaturated zone soil into the infiltrating water that migrates down to the saturated zone. In addition, mobile constituents may leach directly to groundwater from impacted soil that is present beneath the groundwater table. The latter is understood to be more significant to the concentrations of PCBs in groundwater, due to the continuous contact between soil-phase contamination and groundwater.

Leaching of chemicals from impacted soil into groundwater is believed to be occurring at the Site because dissolved PCBs have been identified in groundwater at the Site. **Figures 11 through 16** illustrate the distribution of PCBs detected in groundwater samples collected for each groundwater monitoring event. Due to the low solubility and strong affinity of PCBs for organic phases, the groundwater transport of chemical impacts at concentrations above applicable cleanup criteria is limited to the immediate vicinity of the soil impacts, and the data collected as part of the hydrogeologic site investigation indicates that concentrations immediately upstream of West Brothers Brook are well below the SWPC.

There are currently no on Site uses of groundwater (i.e., drinking water or irrigation) and the chemicals detected in the groundwater are not volatile, so there is no pathway for direct exposure to PCBs via groundwater and thus no associated risk.

6.3.2 Transport of PCBs in Groundwater

<u>Shallow Groundwater Transport</u>

Limited impacts are noted to the east and north portions of the Site in shallow groundwater. Recharge primarily occurs from the northeast and west. Hydraulic conditions at the Site indicate groundwater migration may be occurring at moderate rates; however, PCBs' high affinity for sorbing to organic materials limits the potential for migration of COCs in groundwater. This is also supported by PCB groundwater concentrations Site-wide. Only sporadic detections have occurred throughout groundwater monitoring outside of AOC-1 Fill Area, with exceedances only occurring within AOC-1 in the vicinity of soil containing PCBs at concentrations greater than 1,000 mg/kg.

The groundwater mound in portions of Fields #2 and #3 is caused by recharge from the topographic high to the west and infiltrating precipitation and the restrictions on discharge to West Brothers Brook, due to its concrete culvert. The highest groundwater concentrations originate beneath the eastern portion of Field #3 and southeastern portion of Field #4 and the western reaches of the west parking lot where PCB concentrations in the fill material are the highest. Shallow groundwater mainly flows to the southeast paralleling the historic West Brothers Brook channel.

Based on groundwater elevation observations, groundwater on-site appears to have a hydraulic connection with West Brothers Brook. However, this interaction is limited due to the concrete-lined construction in areas to the west and south of the Site. Thermal anomalies indicative of groundwater – surface water interaction from the thermal infrared survey conducted were identified via seams and/or cracks in the concrete channel, but the significance of this interaction is minor compared to the flow of water in the channel. Monitored groundwater elevations on-site are consistently observed to be higher than the inferred surface water elevation imposing a gradient toward the brook. However, the discrete nature of the discharge locations and low concentrations and/or non-detects in shallow monitoring wells adjacent to the brook to the west and south represents an insignificant mass loading mechanism to the engineered portion of the brook. Shallow groundwater contours indicate that the areas with the highest groundwater concentrations flow toward the natural channel of the brook. PCB concentrations in groundwater near the natural channel of the brook are well below applicable criteria.

Vertical Groundwater Transport

Five deep groundwater monitoring wells were installed during 2017 to further assess geology, interactions between the shallow and deeper aquifer, and the vertical distribution of PCBs at the Site. In general, there are strong downward gradients and delayed responses of the deep aquifer to precipitation events, indicating limited direct connection between the shallow and deep aquifer. However, stronger hydraulic connections may be present in the areas around the MW-AJ13 and MW-AM16 well couplets as evidenced by similar shallow and deep aquifer groundwater elevations that track more closely to one another. However, when looking at the vertical hydraulic gradients of the five monitoring well clusters, MW-AJ13 and MW-AJ13D is the only well cluster that consistently exhibits a neutral to upward hydraulic gradient, which changes occasionally during precipitation events, suggesting a strong connection between the shallow and deep aquifer in this area. This well cluster is the only one where deep aquifer PCB concentrations have exceeded the SWPC & GWPC, suggesting mixing of groundwater within the shallow and deep overburden within the vicinity of the MW-AJ13 cluster.

In other locations, despite a vertical separation between shallow and deep well screens of only 10 to 15 feet, PCB concentrations of groundwater were consistently below RSR criteria in the deep aquifer.

In the area of the elevated groundwater mound, at monitoring well MW-Y9 and MW-Y9D, where infiltrating precipitation has been seen to pond on the ground surface, localized groundwater recharge is believed to emanate from bedrock to the west, and horizontal flow is constrained by the concrete culvert and filled wetland channels. PCBs have only intermittently been detected at concentrations well below the GWPC and SWPC.

In locations with elevated PCB concentrations beneath the synthetic turf fields, groundwater elevations are generally feet below their respective measuring points and during the study period did not approach ground surface. At monitoring well MW-AH16R, which is located at the western edge of the west parking lot, groundwater has been observed to be within approximately one foot of ground surface. Additional monitoring of groundwater elevation is planned for this area.

Infiltration and Runoff

Relatively high infiltration rates were measured during the dry summer months. As described in previous sections, infiltration and subsequent recharge to the shallow portion of the aquifer is expected be somewhat reduced beneath the artificial turf Fields #3 and #4. While the perforations in the drainage mat allow for some infiltration capacity, the vertical anisotropy in hydraulic parameters (i.e., the open channels in the horizontal direction of the drainage mat relative to the underlying soil) likely keeps the majority of

the infiltrated precipitation moving horizontally to the perimeter drainage network, at least during sustained rain events.

As described in **Section 2.4.5**, near-surface saturation reduces the infiltration rate and allows successive precipitation events to pond atop of each other. This process can slow infiltration through the perforations in the drainage mat and results in anisotropy that favors horizontal drainage. Similarly, in the location of monitoring well MW-Y9, on the south side of Field #3 which receives additional drainage of precipitation from the Field #3 drainage mat, stormwater has been observed to pond on ground surface. Because this area also likely received groundwater recharge from bedrock, shallow groundwater is within 1-2 feet of the ground surface much of the time; precipitation infiltrated successively during one rain event and demonstrated that the assimilated water level can exceed the measuring point elevation (top of casing). Stormwater may pond, but still induces a vertical and lateral gradient here, where shallow groundwater flows radially from this location due to disconnected shallow and deep portions of the aquifer (i.e., where significant peat is present). Groundwater at monitoring well MW-Y9 has usually been non-detect for PCBs, and ponded water, which is derived from precipitation, is expected to also be non-detect for PCBs.

In the area of the synthetic turf fields, stormwater infiltrates the synthetic turf and flows through the drainage layer and compacted stone layer to the perimeter drains. It is worth noting that the field drain outfalls were not flowing during several rain events, including one large rain event in October 2017, which suggests that the compacted stone beneath the fields and perimeter recharge the shallow aquifer.

A sample was collected from the Fields #3 and #4 field drain outfalls (see **Figure 2**) on September 26, 2018, when the water table was elevated prior to the rain event. PCBs were detected in the water flowing from the outfall pipe at Field #3 at a concentration of 0.018 µg/L and from the drainage pipe at Field #4 at a concentration of 0.11 µg/L. These concentrations are below the SWPC and the TSCA standard for unrestricted use of water given at 40 CFR 761.79(b)(1)(iii). Continued monitoring of water levels and the potential for stormwater discharge is planned.

7. Conclusions/Recommendations

PCBs have shown limited mobility in groundwater at the Site. Based on the transport properties of PCBs, the current distribution of PCBs in groundwater as compared to that in soil, the transport of dissolved PCBs is limited. PCBs are only detected in groundwater at concentrations in excess of applicable standards within the most heavily impacted portions of the filled former wetland area. Lateral hydraulic gradients in the shallow portion of the aquifer are primarily a function of recharge to shallow groundwater from the topographic highs east and west of the Site, and infiltrating precipitation, especially around the edges of the synthetic fields. The concrete-lined channel of West Brothers Brook forms a heavily restricted drainage feature that, in conjunction with the hydrologic inputs identified previously, forms a groundwater mound in the vicinity of Field #3. The former West Brothers Brook channel, which historically bisected the Site, likely acts as a preferential drainage feature for shallow groundwater to flow toward the natural channel of West Brothers Brook. PCB concentrations in shallow groundwater adjacent to West Brothers Brook indicate that impacted groundwater may be discharging in this location. However, concentrations at these locations are consistently less than the SWPC.

Shallow groundwater in the fill material is generally not well connected to deep groundwater in the sandy till. However, some migration of PCBs to the deep aquifer has occurred in localized areas where greater connections exist are evident in the data for the MW-AJ13 well couplet, located near the center of Fields #3 and #4. In this area, PCB concentrations in groundwater in the sandy till occasionally exceed the SWPC. Similar interactions may occur in other locations due to thinning of the peat layer or coarsening of the silt/peat layer, allowing a hydraulic connection between the shallow and deep and thus vertical transport of PCBs into the deeper aquifer.

Thermal anomalies infer groundwater is discharging to the concrete-lined portion of West Brothers Brook, but such discharges are localized and generally appear to be modest. PCB detections in groundwater have been sporadic along the west and south portions of the playing fields, along the brook, and concentrations are uniformly below the SWPC in these areas. Thus, while PCB impacts may be moving toward the brook in this location, the impacts are likely insignificant based on the discrete nature of the discharge locations and very low (or non-detect) concentrations of PCBs identified in groundwater adjacent to the brook.

The potential for migration of PCBs from shallow groundwater to the surface appears insignificant. While groundwater elevations at well MW-Y9 exceeded the measuring point elevation after a very wet February 2018 and a significant precipitation event in early March 2018, the groundwater elevation was reflective of ponded rainwater transported by runoff through the artificial turf drainage mat, which assimilated into the groundwater over the course of 10 hours, as lateral and downward groundwater flow drained this area. Under such conditions, groundwater cannot reach ground surface, because of the strong downward gradient produced by infiltrating rainwater. Based on the prevalence of non-detect results in groundwater at well MW-Y9 and the source of ponded water, it is unlikely that PCB impacts would be present in ponded water at this location.

Based on the results of the hydrogeologic study and turf field material evaluation, additional limited assessment activities are recommended to further characterize hydrogeologic conditions within the fill area. To that end, AECOM will continue operation of transducer and rain gauge at the Site to expand the data set and observe aquifer response to precipitation events over time, focusing on the shallow aquifer to identify when the water table might interact with the field drains and will continue to monitor groundwater quality to assess potential seasonal variations in deep groundwater concentrations.

8. References

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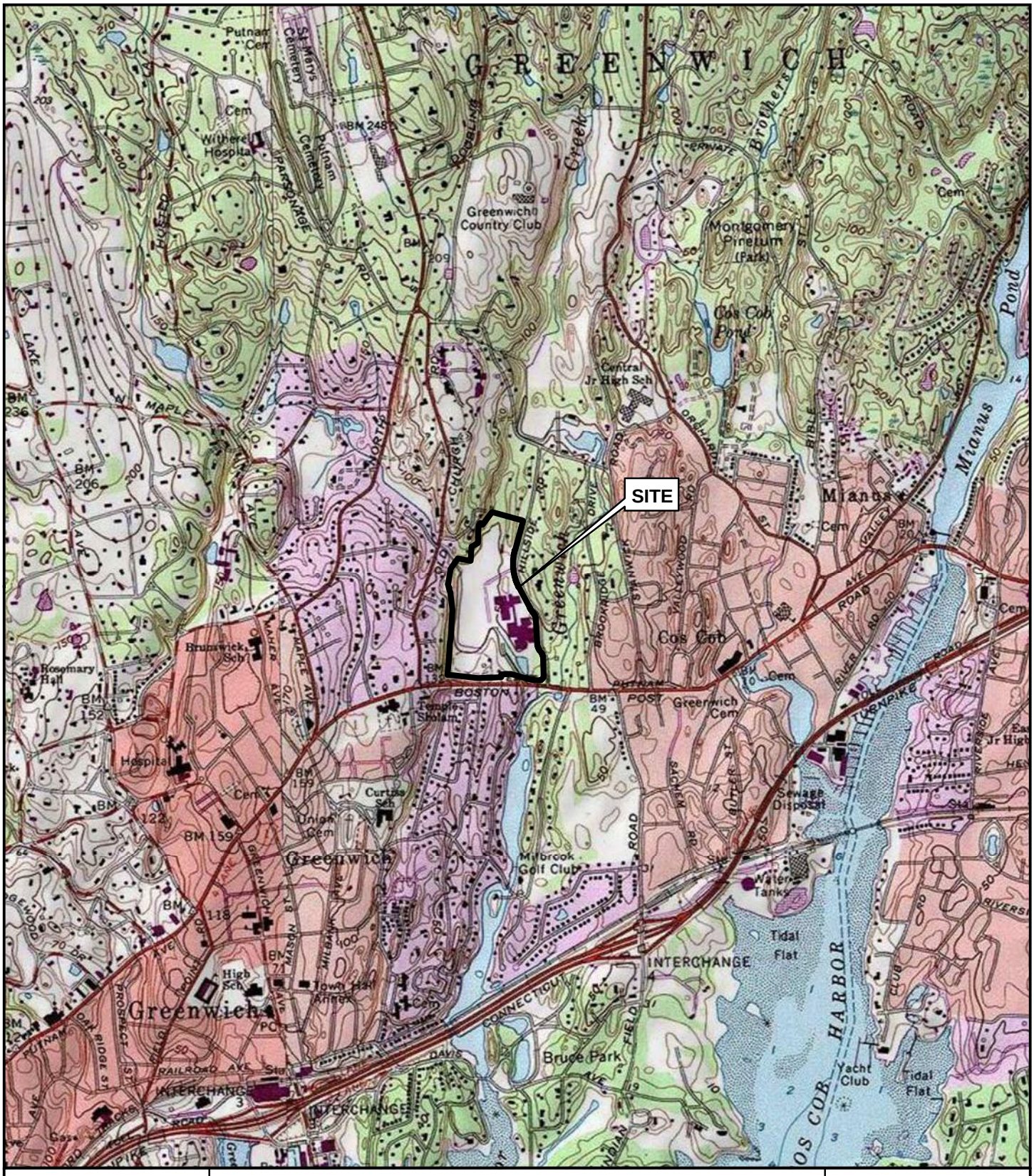
Figures



Map Location



SITE LOCATION MAP
GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

0 500 1,000 2,000 3,000 4,000 5,000 6,000 Feet

0 100 200 400 600 800 1,000 1,200 1,400 1,600 Meters

Map Projection: State Plane, NAD 83, Feet.
Image Source: National Geographic Society Quadrangle: Stamford, CT.

Scale: 1:24,000

AECOM

Figure 1

Project #: 60432356

Path: J:\Indl_Service\Project Files\Greenwich_High_School\GIS\Projects\Remedial_Investigation_Report\Figure_1-1_Site_Location_Map.mxd

MAPPING REFERENCE:

1. MAPPING INFORMATION SHOWN PROVIDED BY THE TOWN OF GREENWICH FROM PLANS BY DTC ENVIRONMENTAL CONSULTANTS, DATE UNKNOWN.
2. ADDITIONAL INFORMATION FROM SURVEYS AND FIELD OBSERVATION PERFORMED BY MILONE AND MACBROOM, VARIOUS DATES.
3. HORIZONTAL COORDINATE SYSTEM: CONNECTICUT STATE PLANE NAD 83.
4. VERTICAL DATUM: NGVD 29.
5. ADDITIONAL INFORMATION ADDED FROM WEST PARKING LOT EXPANSION AS BUILT DESIGN DRAWINGS BY NAFIS & YOUNG ENGINEERS, INC., DATE 01 / 14 / 2016.

LEGEND

- PROPERTY LINE
- BUILDING LINE
- RETAINING WALL
- CURB
- PAVEMENT
- GUIDE RAIL
- FENCE
- W — WATER LINE
- E — ELECTRIC LINE
- G — GAS LINE
- FBR — FIBER OPTIC LINE
- STORM SEWER PIPING
- SANITARY SEWER PIPING
- SANITARY SEWER MANHOLE
- SDMH — STORM MANHOLE
- CATCH BASIN
- ELEC MH — ELECTRIC MANHOLE
- HYDRANT
- UTILITY POLE
- LIGHT POLE
- SIGN
- IRR — IRRIGATION PIPING
- V — SURVEILLANCE LINE
- TREE
- TREE LINE
- BRUSH LINE
- WATER
- 45 — CONTOUR (1 FT. INTERVAL)
- WETLAND LIMITS
- #XX — WETLAND FLAG
- MONITORING WELL

FIELD #1
FIELD #2
FIELD #3
FIELD #4
FIELD #5
FIELD #6
FIELD #7
WEST BROTHERS BROOK
FIELD #3 DRAINAGE PIPE
FIELD #4 DRAINAGE PIPE
PARKING LOT
STORMWATER DETENTION BASIN
1,000 GALLON UST
DIESEL GENERATOR WITH 200 GALLON AST
ELECTRIC SUBSTATION
AREA OF SOIL STOCKPILE RELOCATION
STORM DRAIN OUTLET
LOCATION OF CURRENT AND FORMER 15,000 GALLON UST's
MISA AUDITORIUM
GREENWICH HIGH SCHOOL
CIDER MILL POND
EAST PUTNAM AVENUE (CT ROUTE 1)
HILLSIDE ROAD

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-6800
www.aecom.com

SCALE:
0 80 160 240
1" = 80'
SCALE FEET

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

GREENWICH HIGH SCHOOL
10 HILLSIDE RD
GREENWICH, CT

FIGURE 2
SITE PLAN

JANUARY 2019

JOB 60432356
FILE NO.
CAD FILE SITE PLAN8.18
SHEET

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PLOT DATE: Friday, January 04, 2019 2:09:17 PM
ARCH D - 3-7-05

LEGEND

- SOIL BORING LOCATION (DTC)
- 0-3" ONLY SAMPLE LOCATION (DTC)
- 0-1' ONLY SAMPLE LOCATION (DTC)
- 0-3" and 0-1' SAMPLE LOCATION (DTC)
- CROSS-SECTION TRANSECT LINE
- MISA PROJECT SOIL BORING LOCATION (AECOM)
- SOIL BORING LOCATION (AECOM)
- STEP OUT BORING LOCATION (AECOM)
- MONITORING WELL LOCATION (AECOM)
- PIEZOMETER LOCATION (AECOM)
- GEOTECHNICAL MONITORING WELL LOCATION

AREAS OF CONCERN

- AOC 1 - FILL AREA

NOTE:
MW-AM16D IS OFFSET 12.63' FROM TRANSECT A-A'
MW-AJ13D IS OFFSET 40.06' FROM TRANSECT B-B'
MW-Y9D IS OFFSET 25.40' FROM TRANSECT C-C'
MW-Y15D IS OFFSET 10.90' FROM TRANSECT C-C'
MW-AA12D IS OFFSET 35.26' FROM TRANSECT C-C'

AOC-1
FIELD #1
FIELD #2
FIELD #3
FIELD #4
FIELD #5
FIELD #6
FIELD #7
WEST BROTHERS BROOK
EAST PUTNAM AVENUE
HILLSIDE ROAD
GREENWICH HIGH SCHOOL
CIDER MILL POND
PARKING LOT
STORMWATER DETENTION BASIN
1,000 GALLON UST
DIESEL GENERATOR WITH 200 GALLON AST
ELECTRIC SUBSTATION
AREA OF SOIL STOCKPILE RELOCATION
STORM DRAIN OUTLET
LOCATION OF CURRENT AND FORMER 15,000 GALLON UST's
FIELD #3 DRAINAGE PIPE
FIELD #4 DRAINAGE PIPE
A
A'
B
B'
C
C'

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SCALE:
1" = 80'
0 80 160 240
SCALE FEET

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GREENWICH HIGH SCHOOL
10 HILLSIDE RD
GREENWICH, CT

FIGURE 3
SITE PLAN WITH CROSS-SECTION LOCATIONS
HYDROGEOLOGIC SITE INVESTIGATION

JANUARY 2019

JOB 60432356
FILE NO.
CAD FILE CROSS SECTIONS PLAN VIEWS.1B
SHEET

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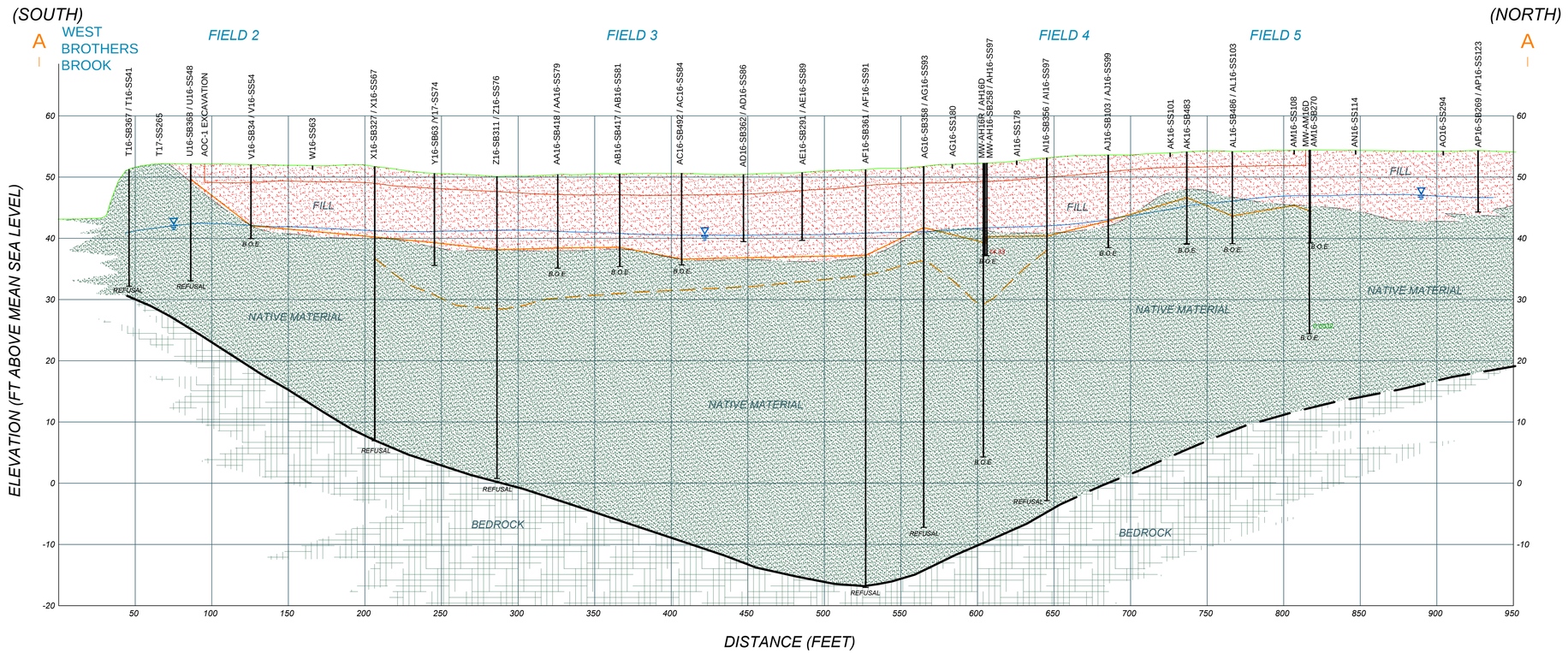

NOTES:

1. ELEVATIONS SHOWN ARE BASED ON THE 1929 NGVD.
2. GROUNDWATER ELEVATIONS ARE BASED ON THE JULY 23, 2012 GENERALIZED GROUNDWATER CONTOUR MAP.

LEGEND:

- WATER TABLE
- PEAT MARKER
- PEAT UPPER BOUNDARY
- PEAT LOWER BOUNDARY
- B.O.E. BOTTOM OF EXPLORATION

GROUNDWATER PCB CONCENTRATION ($\mu g/kg$) (JUNE 2018)

- 14.338 PCB CONCENTRATION ($\mu g/kg$) >0.5
- 0.0026 PCB CONCENTRATION ($\mu g/kg$) <0.5
- ND PCB NOT DETECTED

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SCALE:

1" = 10' VERTICAL SCALE (0, 10, 20, 30, 40 FEET)

1" = 40' HORIZONTAL SCALE (0, 40, 80, 120 FEET)

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

GREENWICH HIGH SCHOOL
10 HILLSIDE RD
GREENWICH, CT

FIGURE 4
CROSS SECTION A - A'
HYDROGEOLOGIC SITE INVESTIGATION

AUGUST 2018

JOB 60432356
FILE NO.
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SHEET

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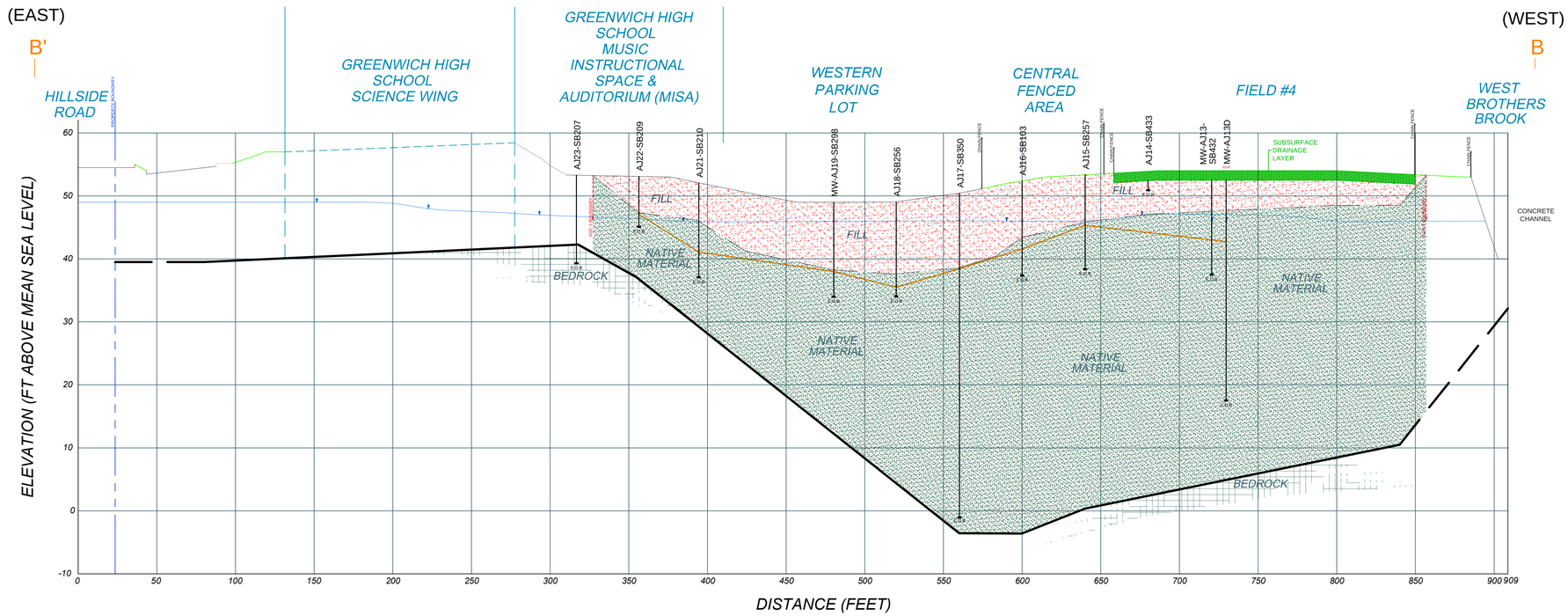
ARCH D - 3-7-05



NOTES:

1. ELEVATIONS SHOWN ARE BASED ON THE 1929 NGVD.
2. GROUNDWATER ELEVATIONS ARE BASED ON THE JULY 23, 2012 GENERALIZED GROUNDWATER CONTOUR MAP.

LEGEND:

- WATER TABLE
- PEAT MARKER
- PEAT UPPER BOUNDARY
- PEAT LOWER BOUNDARY
- B.O.E. BOTTOM OF EXPLORATION

GROUNDWATER PCB CONCENTRATION ($\mu g/kg$) (JUNE 2018)

- 14.338 PCB CONCENTRATION ($\mu g/kg$) >0.5
- 0.0026 PCB CONCENTRATION ($\mu g/kg$) <0.5
- ND PCB NOT DETECTED

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

AECOM

SCALE:

1" = 10' VERTICAL SCALE (0, 10, 20, 30, 40 FEET)

1" = 40' HORIZONTAL SCALE (0, 40, 80, 120 FEET)

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

GREENWICH HIGH SCHOOL
10 HILLSIDE RD
GREENWICH, CT

FIGURE 5
CROSS SECTION B - B'
HYDROGEOLOGIC SITE INVESTIGATION

AUGUST 2018

JOB 60432356
FILE NO.
CAD FILE CROSS SECTIONS8.18
SHEET

PATH/FILENAME: P:\60225155 - GHS\GREENWICH HIGH SCHOOL\ORIGINAL DRAWING FILES\PROJECT\UPDATED\SUPPLEMENTAL DRAWINGS\CROSS SECTIONS\CROSS SECTIONS8.18.DWG
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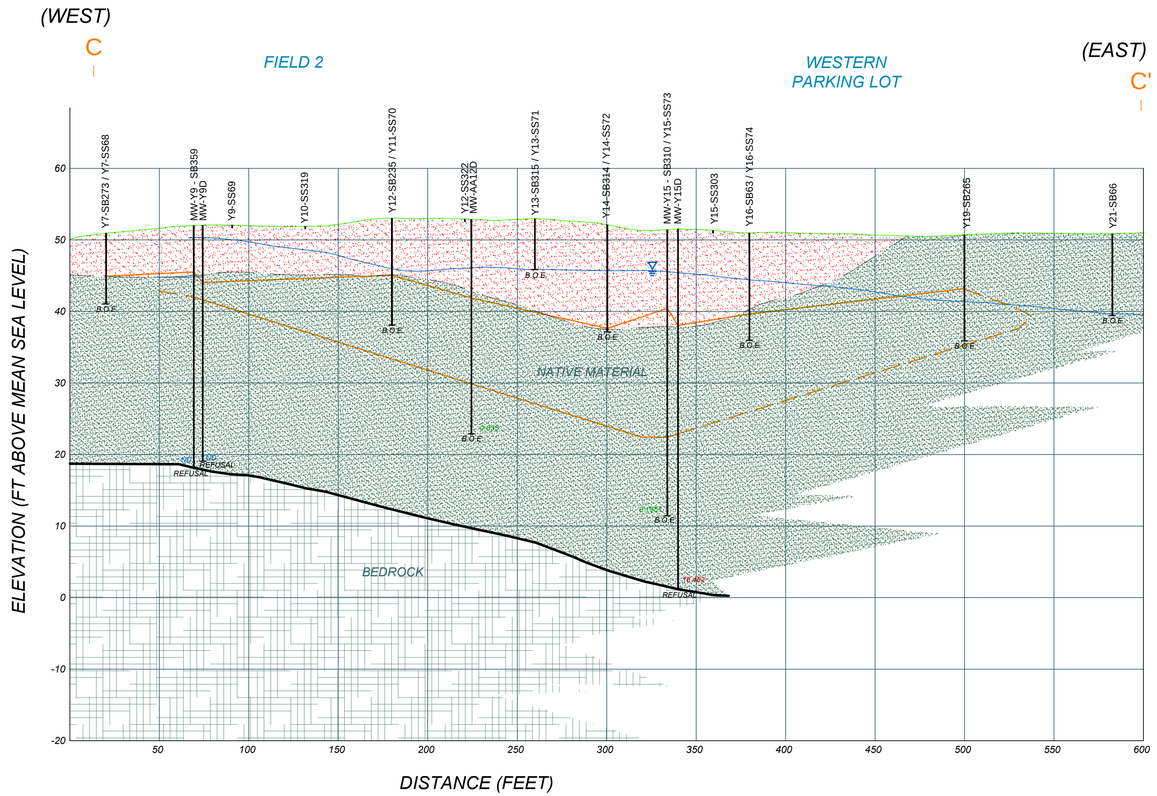
ARCH D - 3-7-05



NOTES:

1. ELEVATIONS SHOWN ARE BASED ON THE 1929 NGVD.
2. GROUNDWATER ELEVATIONS ARE BASED ON THE JULY 23, 2012 GENERALIZED GROUNDWATER CONTOUR MAP.

LEGEND:

- WATER TABLE
- PEAT MARKER
- PEAT UPPER BOUNDARY
- PEAT LOWER BOUNDARY
- B.O.E. BOTTOM OF EXPLORATION

GROUNDWATER PCB CONCENTRATION (µg/kg) (JUNE 2018)

- 14.338 PCB CONCENTRATION (µg/kg) >0.5
- 0.0026 PCB CONCENTRATION (µg/kg) <0.5
- ND PCB NOT DETECTED

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

SCALE:

1" = 10' VERTICAL SCALE (0, 10, 20, 30, 40 FEET)

1" = 40' HORIZONTAL SCALE (0, 40, 80, 120 FEET)

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

GREENWICH HIGH SCHOOL
10 HILLSIDE RD
GREENWICH, CT

FIGURE 6
CROSS SECTION C - C'
HYDROGEOLOGIC SITE INVESTIGATION

AUGUST 2018

JOB 60432356
FILE NO.
CAD FILE CROSS SECTIONS8.18
SHEET

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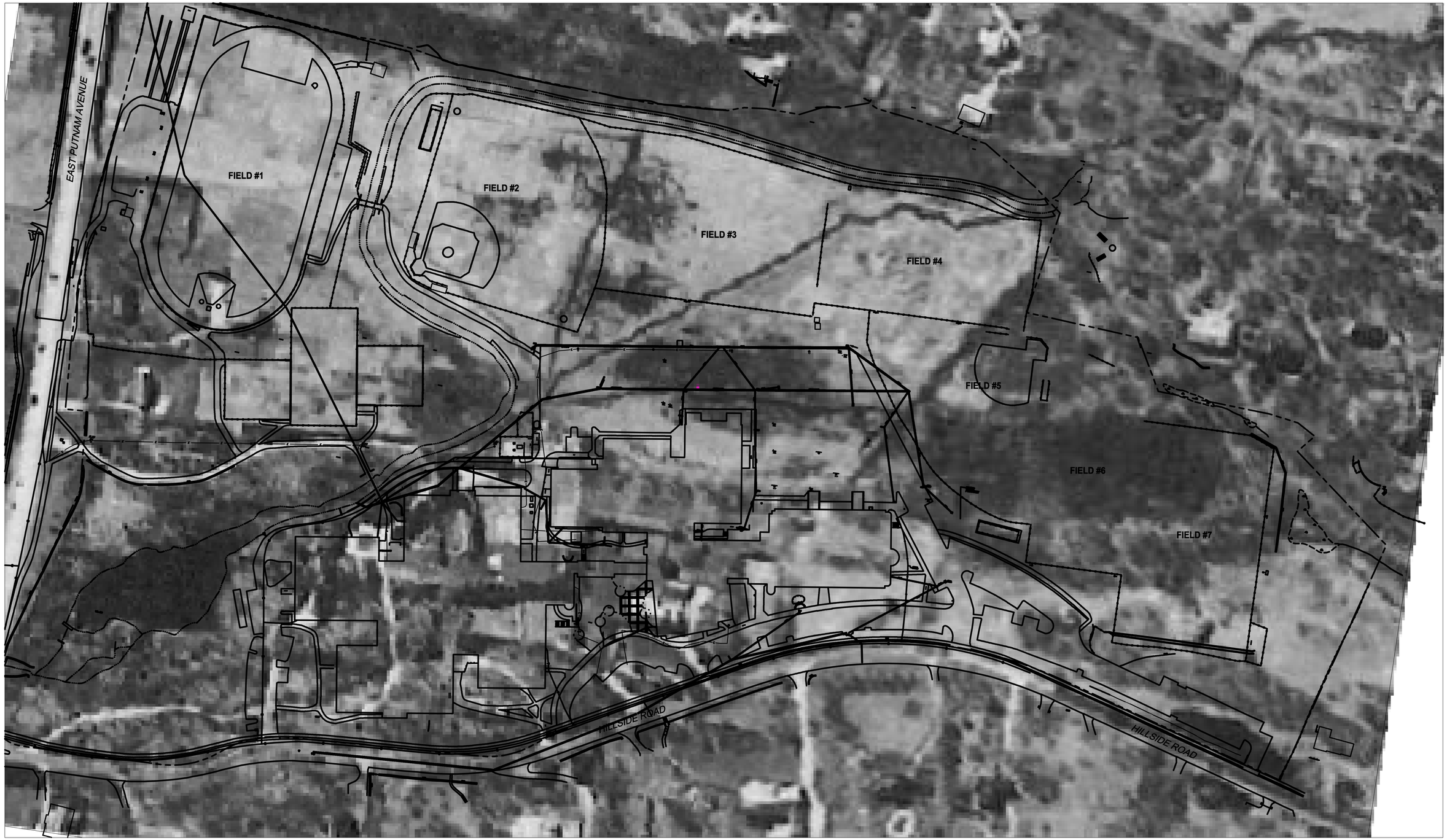
ARCH D - 3-7-05



AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

AECOM

SCALE:

0 80 160 240

1" = 80' SCALE FEET

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

GREENWICH HIGH SCHOOL
10 HILLSIDE RD
GREENWICH, CT

FIGURE 7
1934 AERIAL MAP
HYDROGEOLOGIC INVESTIGATION REPORT

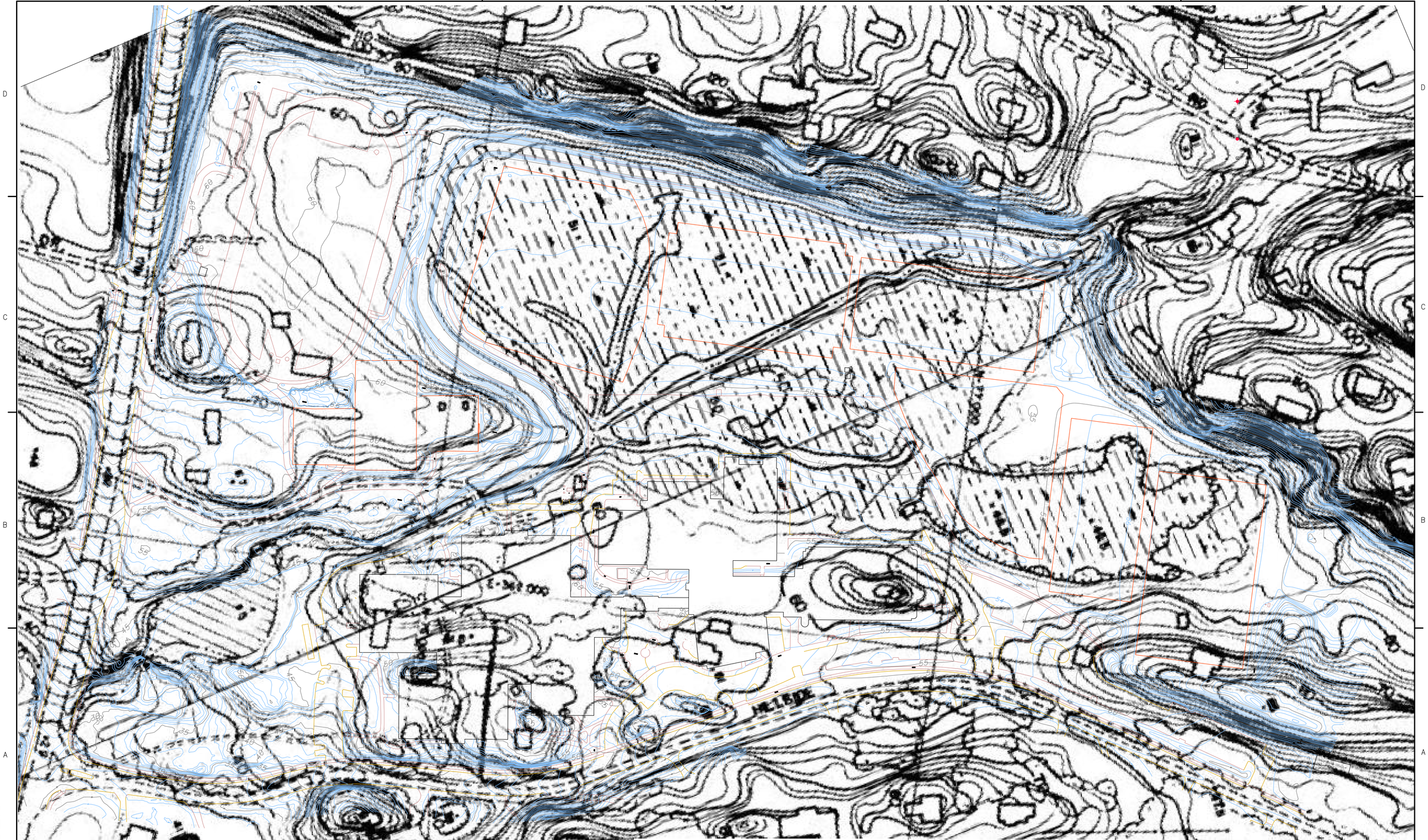
JOB 60225155

FILE NO.

CAD FILE FIGURE_2-2_1934_AERIAL_PHOTOGRAPH

SHEET

LAST UPDATE: Tuesday, February 26, 2013 11:06:02 AM
PLOT DATE: Tuesday, February 26, 2013 11:06:43 AM
ARCH D - 3-7-05



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ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

AECOM

SCALE:

1" = 80'

0 80 160 240

SCALE FEET

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

GREENWICH HIGH SCHOOL
10 HILLSIDE RD
GREENWICH, CT

FIGURE 8
1951 SITE TOPOGRAPHIC MAP OVERLAIN WITH CURRENT SITE FEATURES

JOB 60225155

FILE NO.

CAD FILE FIGURE_2-3_1951_SITE_TOPOGRAPHIC_MAP

SHEET

PATH/FILENAME: J:\WDL_SERVICE\PROJECT FILES\GREENWICH_HIGH_SCHOOL\GIS\PROJECTS\REMEDIAL_INVESTIGATION_REPORT\FIGURE_2-3_1951_SITE_TOPOGRAPHIC_MAP.DWG
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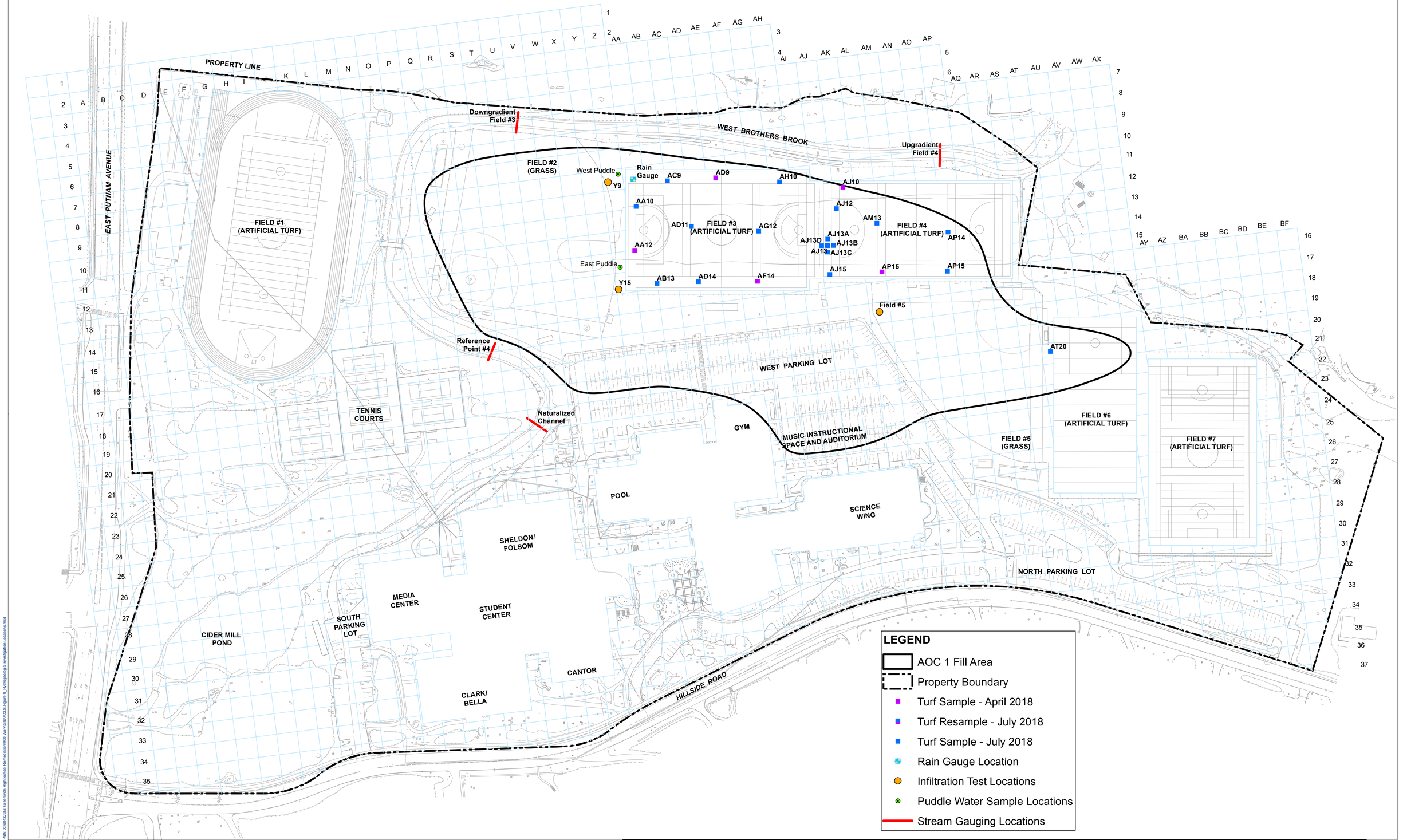
ARCH D – 3-7-05



LEGEND

- AOC 1 Fill Area
- Property Boundary
- Turf Sample - April 2018
- Turf Resample - July 2018
- Turf Sample - July 2018
- Rain Gauge Location
- Infiltration Test Locations
- Puddle Water Sample Locations
- Stream Gauging Locations

AECOM Environment
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(860) 263-5800
www.aecom.com

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

SCALE:

1" = 80' 0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 9
HYDROGEOLOGIC INVESTIGATION LOCATIONS

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

JOB 60432356
FILE NO.
CAD FILE
SHEET

Path: X:\60432356 Greenwich High School Remediation\900-Work\GIS\MXDs\Figure 9_Hydrogeologic Investigation Locations.mxd



LEGEND

- Surface Water Gauging Station
- Shallow Monitotinh Well
- Deep Monitoring Well
- AOC 1 Fill Area
- Property Boundary
- * Pressure Transducer Location

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
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ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

AECOM

N

SCALE:

0 40 80 160 240 Feet
1" = 80'
SCALE

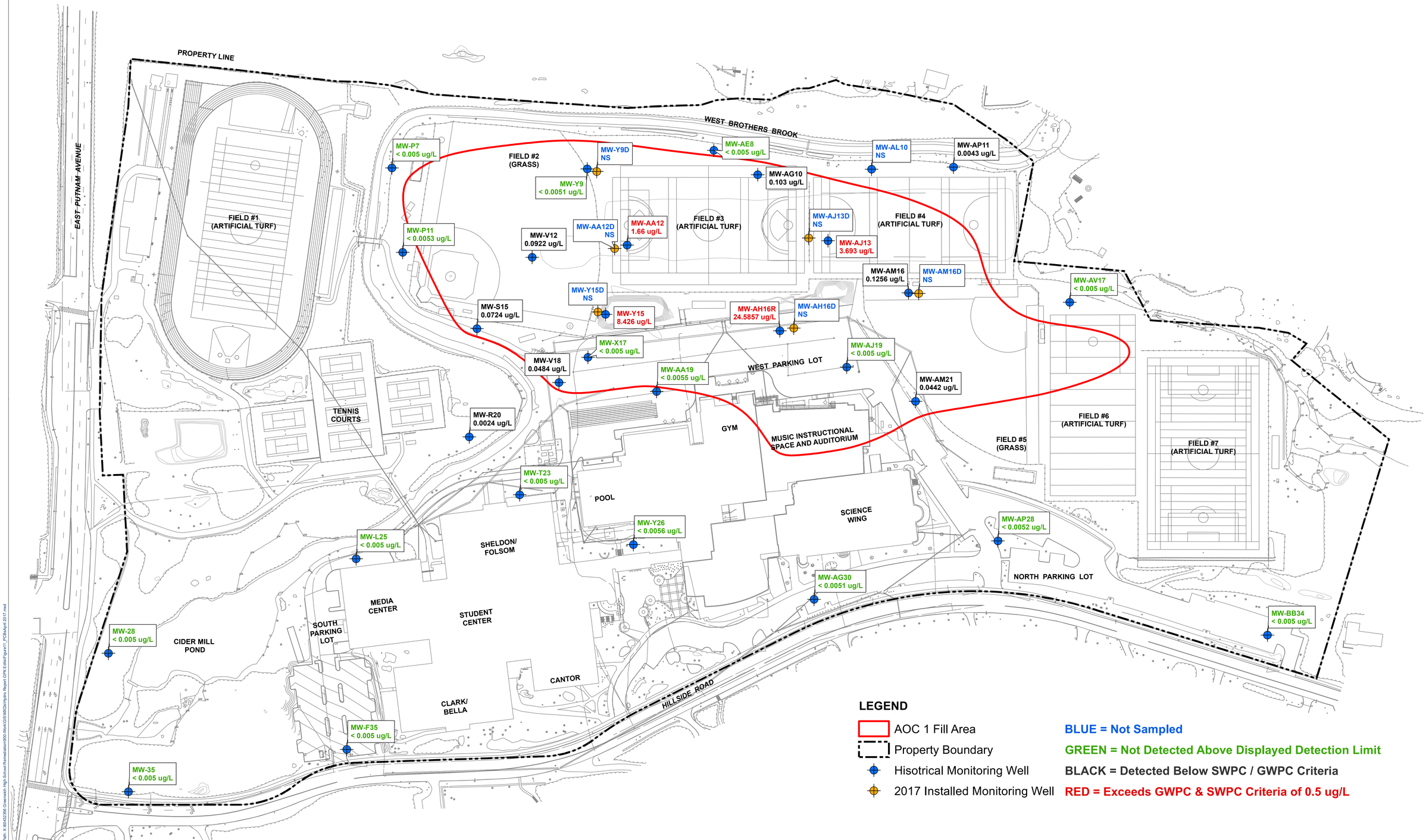
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 10
WELL NETWORK 2018

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: X:\60432366 Greenwich High School Remediation\900-Work\GIS\MXDs\Hydro Report GPK Edits\Figure 10 MW Network.mxd



LEGEND

- AOC 1 Fill Area
- Property Boundary
- Hisotrical Monitoring Well
- 2017 Installed Monitoring Well

BLUE = Not Sampled

GREEN = Not Detected Above Displayed Detection Limit

BLACK = Detected Below SWPC / GWPC Criteria

RED = Exceeds GWPC & SWPC Criteria of 0.5 ug/L

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
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ROCKY HILL, CT 06067
(860) 263-5800
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SCALE:

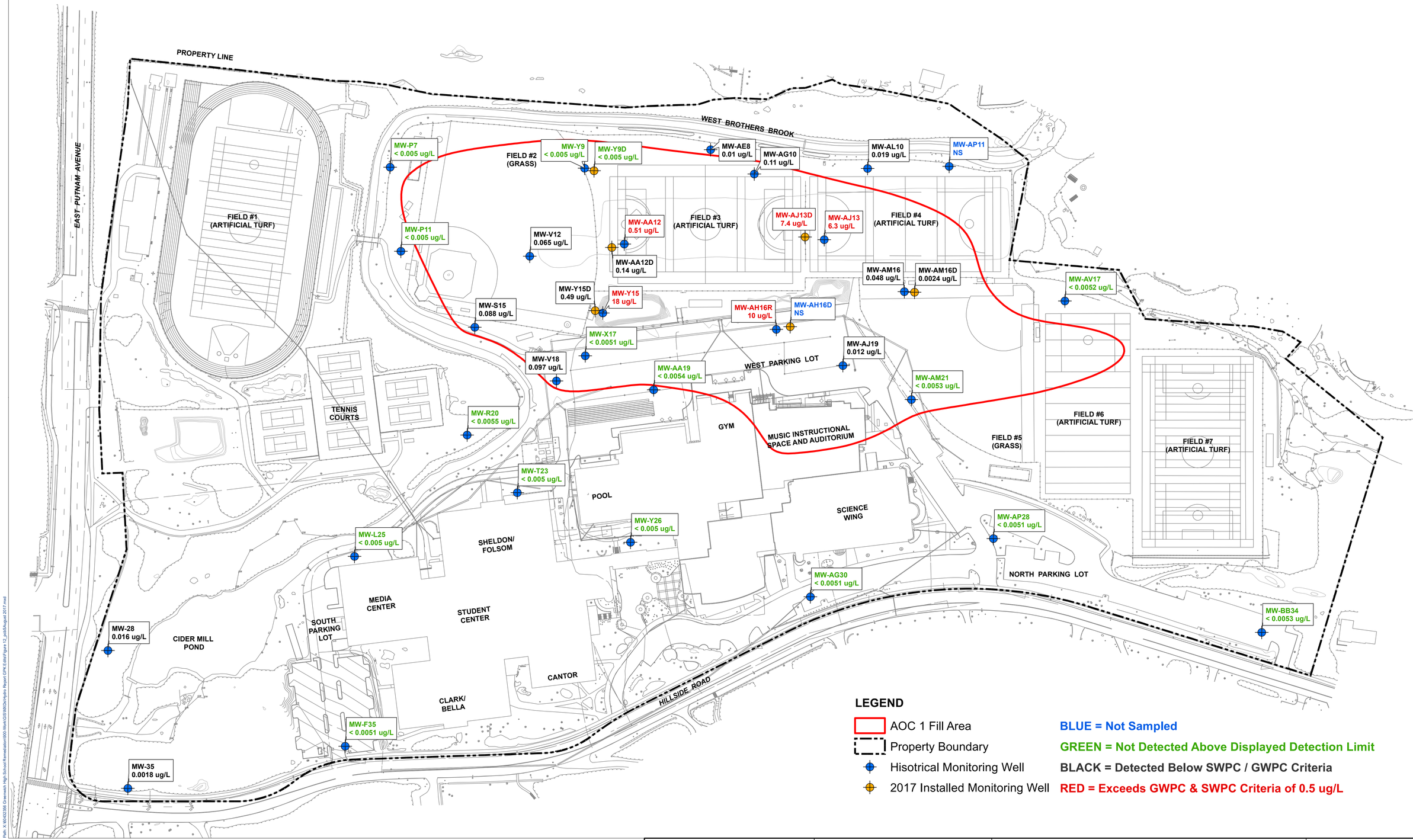
1" = 80' 0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 11
PCBs in Groundwater
April 2017
GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: X:\60432306 Greenwich High School Remediation\600-Work\GIS\MXD\Hydro Report GPK Edits\Figure11_PCBsApril 2017.mxd



LEGEND

- AOC 1 Fill Area
- Property Boundary
- Hisotrical Monitoring Well
- 2017 Installed Monitoring Well

BLUE = Not Sampled

GREEN = Not Detected Above Displayed Detection Limit

BLACK = Detected Below SWPC / GWPC Criteria

RED = Exceeds GWPC & SWPC Criteria of 0.5 ug/L

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

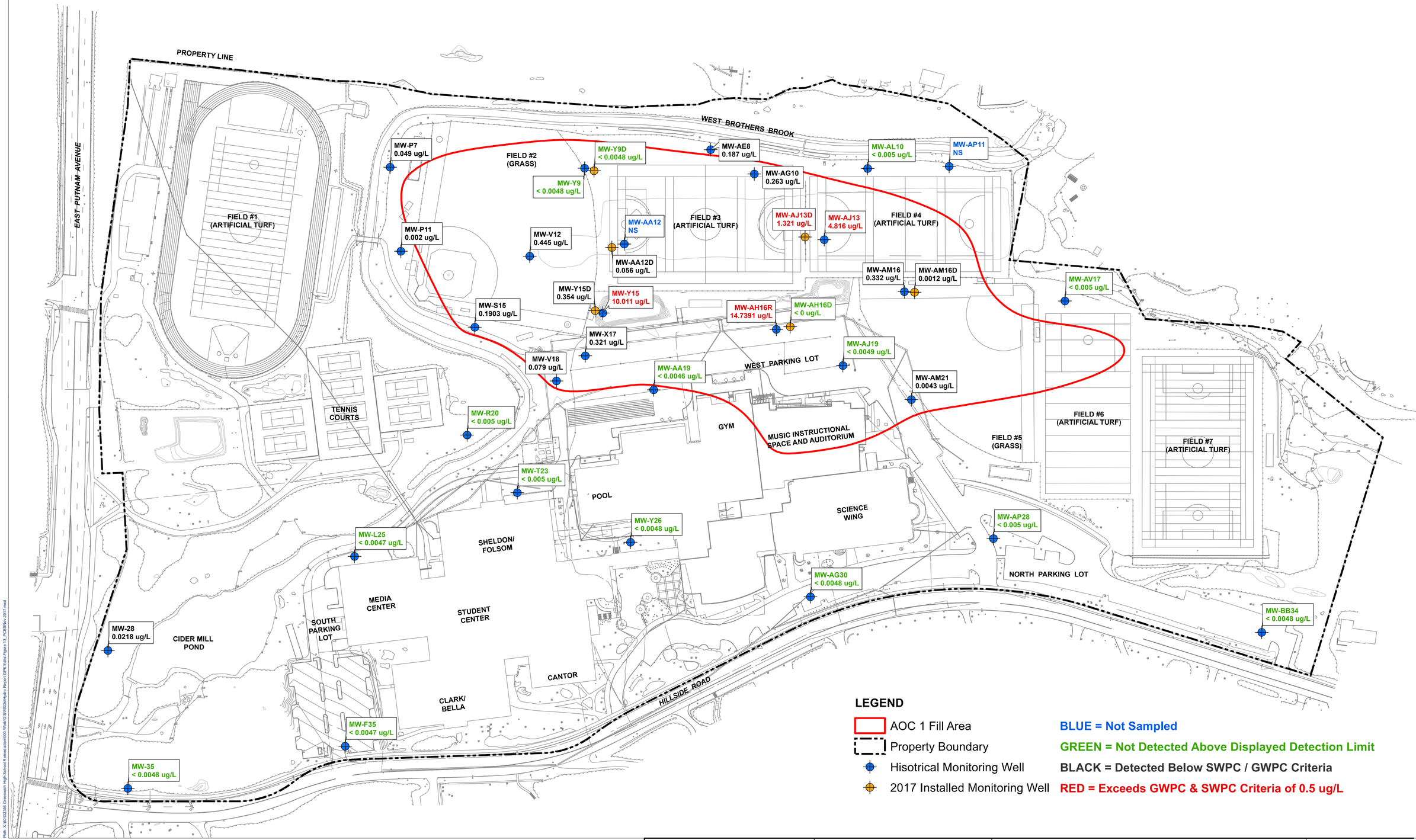
SCALE:
1" = 80'
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 12
PCBs in Groundwater
August 2017
GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: X:\60432308 Greenwich High School Remediation\600-Work\GIS\MXD\Hydro Report GPK Edits\Figure 1-12_pdf\August 2017.mxd



LEGEND

- AOC 1 Fill Area
- Property Boundary
- Hisotrical Monitoring Well
- 2017 Installed Monitoring Well

BLUE = Not Sampled

GREEN = Not Detected Above Displayed Detection Limit

BLACK = Detected Below SWPC / GWPC Criteria

RED = Exceeds GWPC & SWPC Criteria of 0.5 ug/L

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
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ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

SCALE:

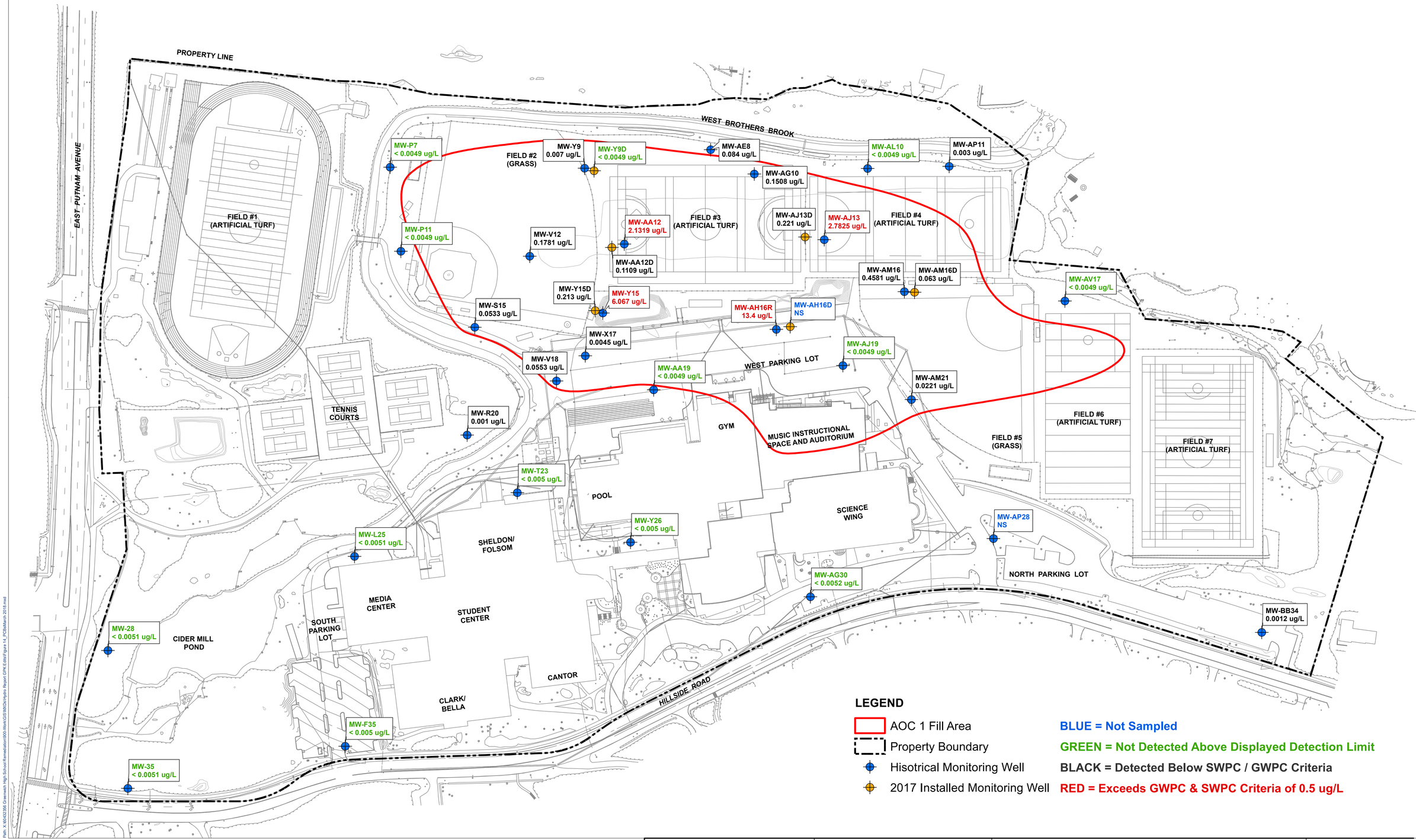
1" = 80' 0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 13
PCBs in Groundwater
November 2017
GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: X:\60432306 Greenwich High School Remediation\600-Work\GIS\MXD\Hydro Report GPK Edits\Figure 13_PCBSNov 2017.mxd



LEGEND

- AOC 1 Fill Area
- Property Boundary
- Hisotrical Monitoring Well
- 2017 Installed Monitoring Well

BLUE = Not Sampled

GREEN = Not Detected Above Displayed Detection Limit

BLACK = Detected Below SWPC / GWPC Criteria

RED = Exceeds GWPC & SWPC Criteria of 0.5 ug/L

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

SCALE:

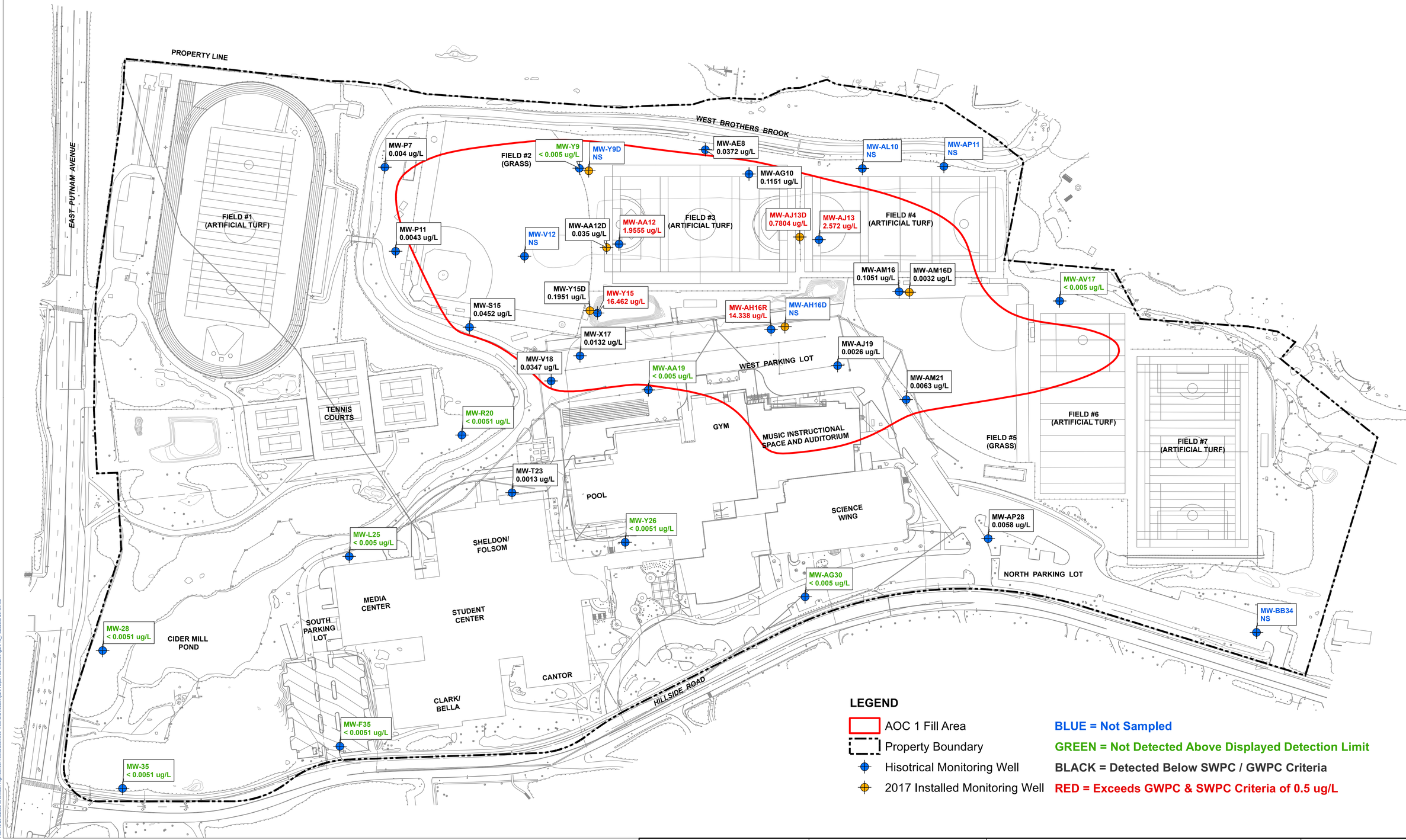
1" = 80' 0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 14
PCBs in Groundwater
June 2018
GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: X:\60432306 Greenwich High School Remediation\600-Work\GIS\MXD\Hydro Report GPK Edits\Figure 14_PCBsMarch 2018.mxd



LEGEND

- AOC 1 Fill Area
- Property Boundary
- Hisotrical Monitoring Well
- 2017 Installed Monitoring Well

BLUE = Not Sampled

GREEN = Not Detected Above Displayed Detection Limit

BLACK = Detected Below SWPC / GWPC Criteria

RED = Exceeds GWPC & SWPC Criteria of 0.5 ug/L

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

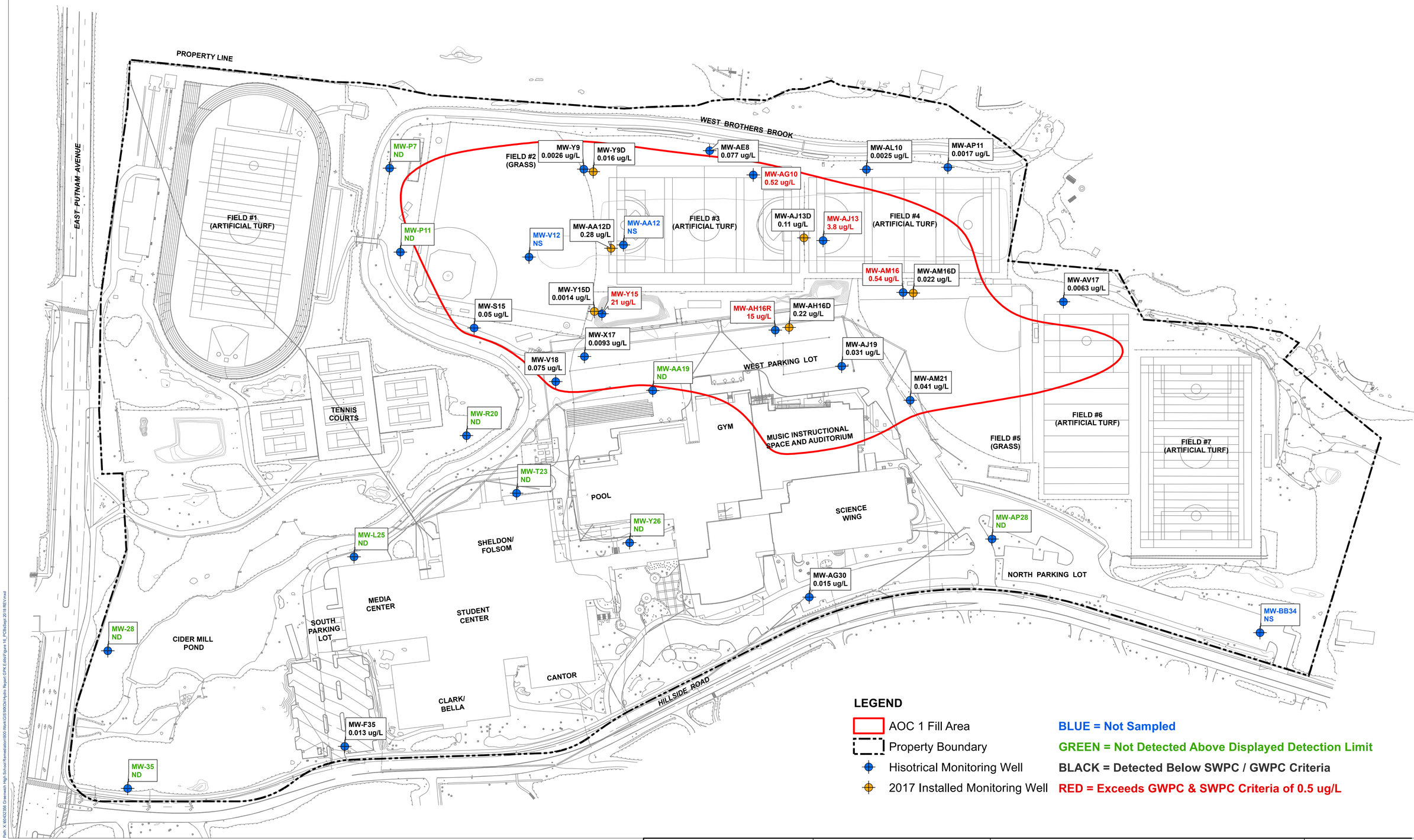
SCALE:
1" = 80'
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 15
PCBs in Groundwater
June 2018
GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: X:\60432308 Greenwich High School Remediation\600-Work\GIS\MXDs\Hydro Report GPK Edits\Figure 15_PCBsJune 2018.mxd



LEGEND

- AOC 1 Fill Area
- Property Boundary
- Hisotrical Monitoring Well
- 2017 Installed Monitoring Well

BLUE = Not Sampled

GREEN = Not Detected Above Displayed Detection Limit

BLACK = Detected Below SWPC / GWPC Criteria

RED = Exceeds GWPC & SWPC Criteria of 0.5 ug/L

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
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ROCKY HILL, CT 06067
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SCALE:

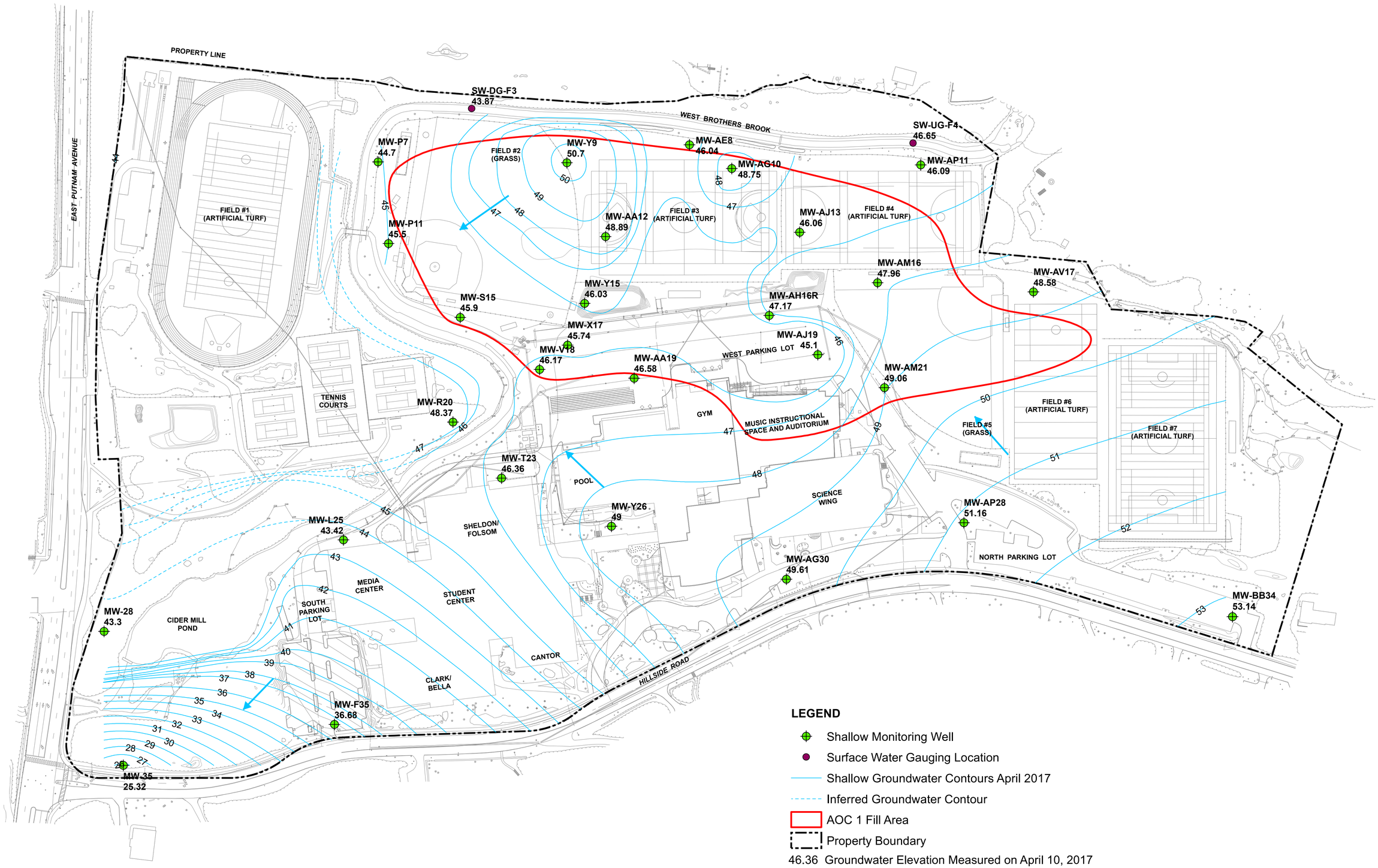
1" = 80' 0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 16
PCBs in Groundwater
September 2018
GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: X:\60432306 Greenwich High School Remediation\600-Work\GIS\MXD\Hydro Report GPK Edits\Figure 16_PCBsSept 2018 REV.mxd



LEGEND

- Shallow Monitoring Well
- Surface Water Gauging Location
- Shallow Groundwater Contours April 2017
- Inferred Groundwater Contour
- AOC 1 Fill Area
- Property Boundary
- 46.36 Groundwater Elevation Measured on April 10, 2017

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
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ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

AECOM

SCALE:

1" = 80'

0 40 80 160 240 Feet

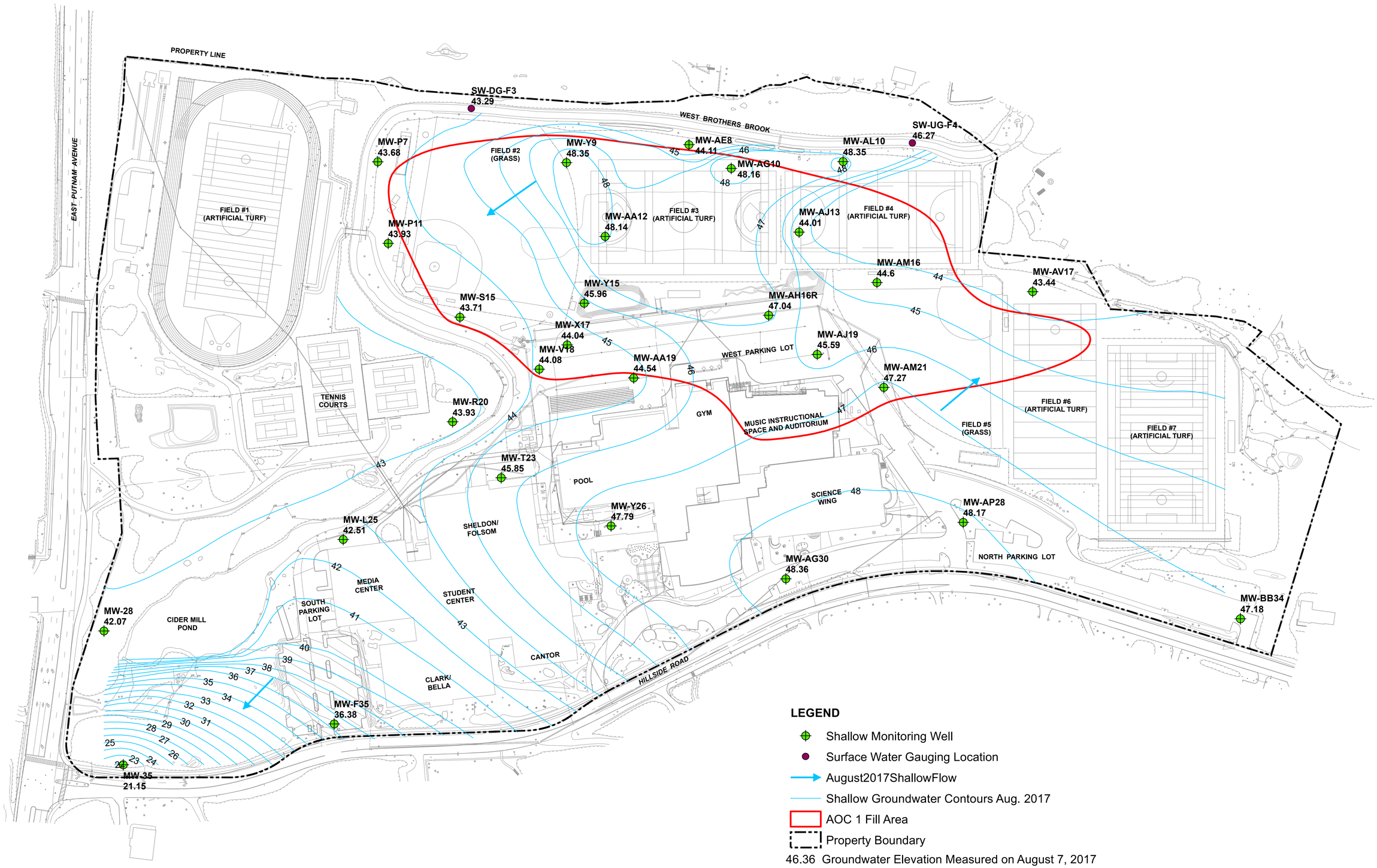
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 17
APRIL 2017
SHALLOW OVERBURDEN GROUNDWATER CONTOURS

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: X:\60432366 Greenwich High School Remediation\900-Work\GIS\MXD\e-Hydro Report GPK Edits\Figure 17_April 2017 Contours.mxd



LEGEND

- Shallow Monitoring Well
- Surface Water Gauging Location
- August2017ShallowFlow
- Shallow Groundwater Contours Aug. 2017
- AOC 1 Fill Area
- Property Boundary
- 46.36 Groundwater Elevation Measured on August 7, 2017

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

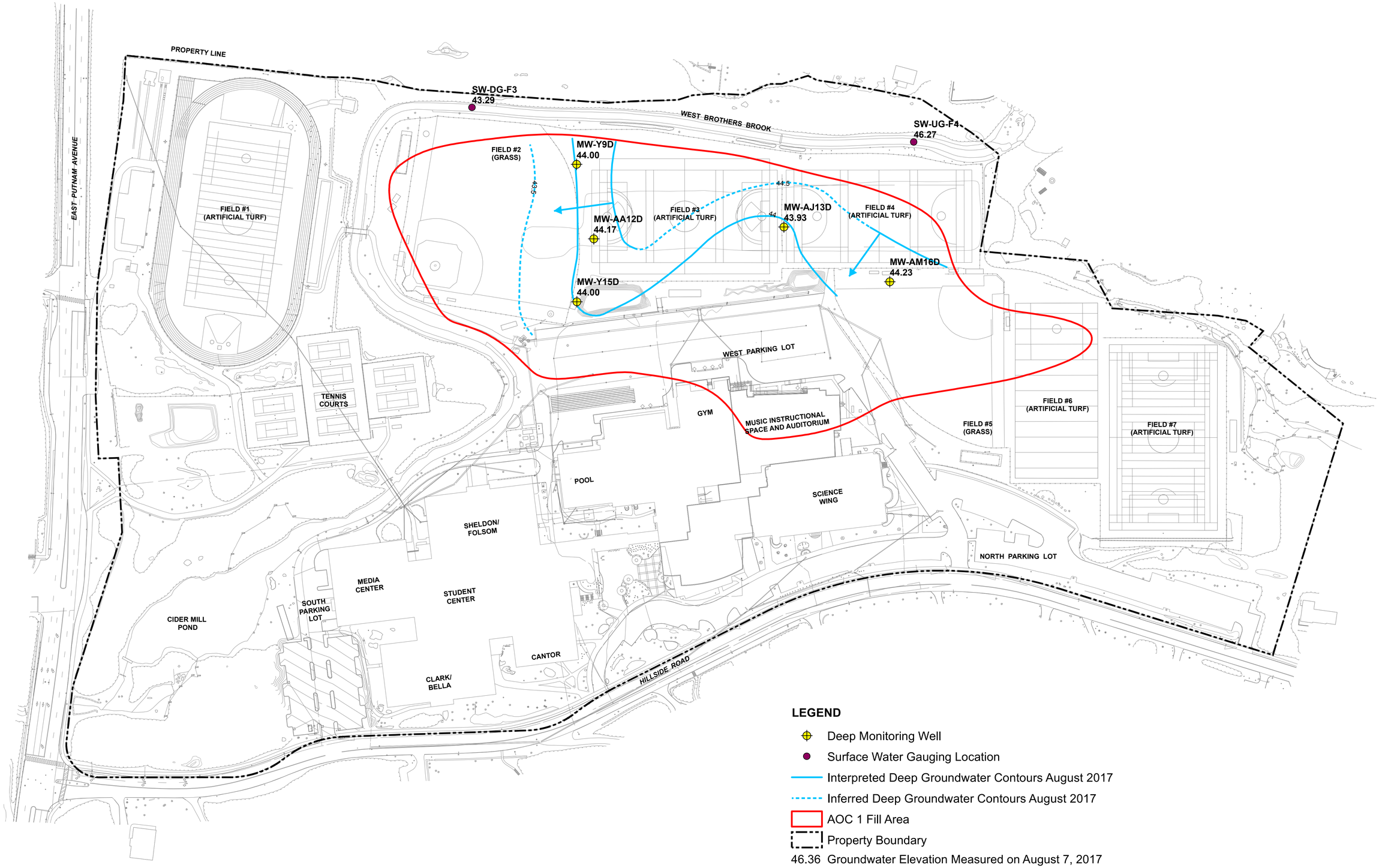
SCALE:
1" = 80'
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 18
AUGUST 2017
SHALLOW OVERBURDEN GROUNDWATER CONTOURS

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: X:\60432366 Greenwich High School Remediation\900-Work\GIS\MXD\e-Hydro Report GPK Edits\Figure 18_August 2017 Contours.mxd



Path: X:\60432356 Greenwich High School Remediation\900-Work\GIS\MXDs\Hydro Report GPK Edits\Figure 19_August 2017 Deep Contours.mxd

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

AECOM

N

SCALE:
1" = 80'
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 19
AUGUST 2017
DEEP OVERBURDEN GROUNDWATER CONTOURS

JOB 60225155
FILE NO.
CAD FILE
SHEET

PROPERTY LINE

EAST PUTNAM AVENUE

SW-DG-F3
43.47

WEST BROTHERS BROOK

SW-UG-F4
46.66

MW-P7
43.91

MW-Y9
48.55

MW-AE8
44.59

MW-AG10
47.51

MW-AL10
45.32

FIELD #2
(GRASS)

FIELD #1
(ARTIFICIAL TURF)

MW-P11
44.17

MW-AA12
47.07

FIELD #3
(ARTIFICIAL TURF)

MW-AJ13
44.49

FIELD #4
(ARTIFICIAL TURF)

MW-AM16
44.56

MW-AV17
44.82

MW-Y15
46.48

MW-S15
44.03

MW-AH16R
46.62

MW-X17
44.33

MW-V18
44.48

WEST PARKING LOT

MW-AJ19
44.9

MW-AA19
44.77

MW-AM21
44.71

TENNIS
COURTS

MW-R20
45.75

GYM

MUSIC INSTRUCTIONAL
SPACE AND AUDITORIUM

FIELD #5
(GRASS)

FIELD #6
(ARTIFICIAL TURF)

FIELD #7
(ARTIFICIAL TURF)

MW-T23
45.98

POOL

MW-Y26
47.88

SCIENCE
WING

MW-AP28
48.21

MW-L25
43.01

SHELDON/
FOLSOM

NORTH PARKING LOT

MW-AG30
48.42

MW-BB34
46.77

MEDIA
CENTER

STUDENT
CENTER

SOUTH
PARKING
LOT

MW-28
42.79

CIDER MILL
POND

CANTOR

HILLSIDE ROAD

CLARK/
BELLA

MW-F35
36.43

MW-35
23.68

LEGEND

- Shallow Monitoring Well
- Surface Water Gauging Location
- Shallow Groundwater Contours Nov. 2017 (NAD83)
- Inferred Groundwater Contour
- AOC 1 Fill Area
- Property Boundary
- 46.36 Groundwater Elevation Measured on Nov. 13, 2017

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
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ROCKY HILL, CT 06067
(860) 263-5800
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AECOM

N

SCALE:

1" = 80'

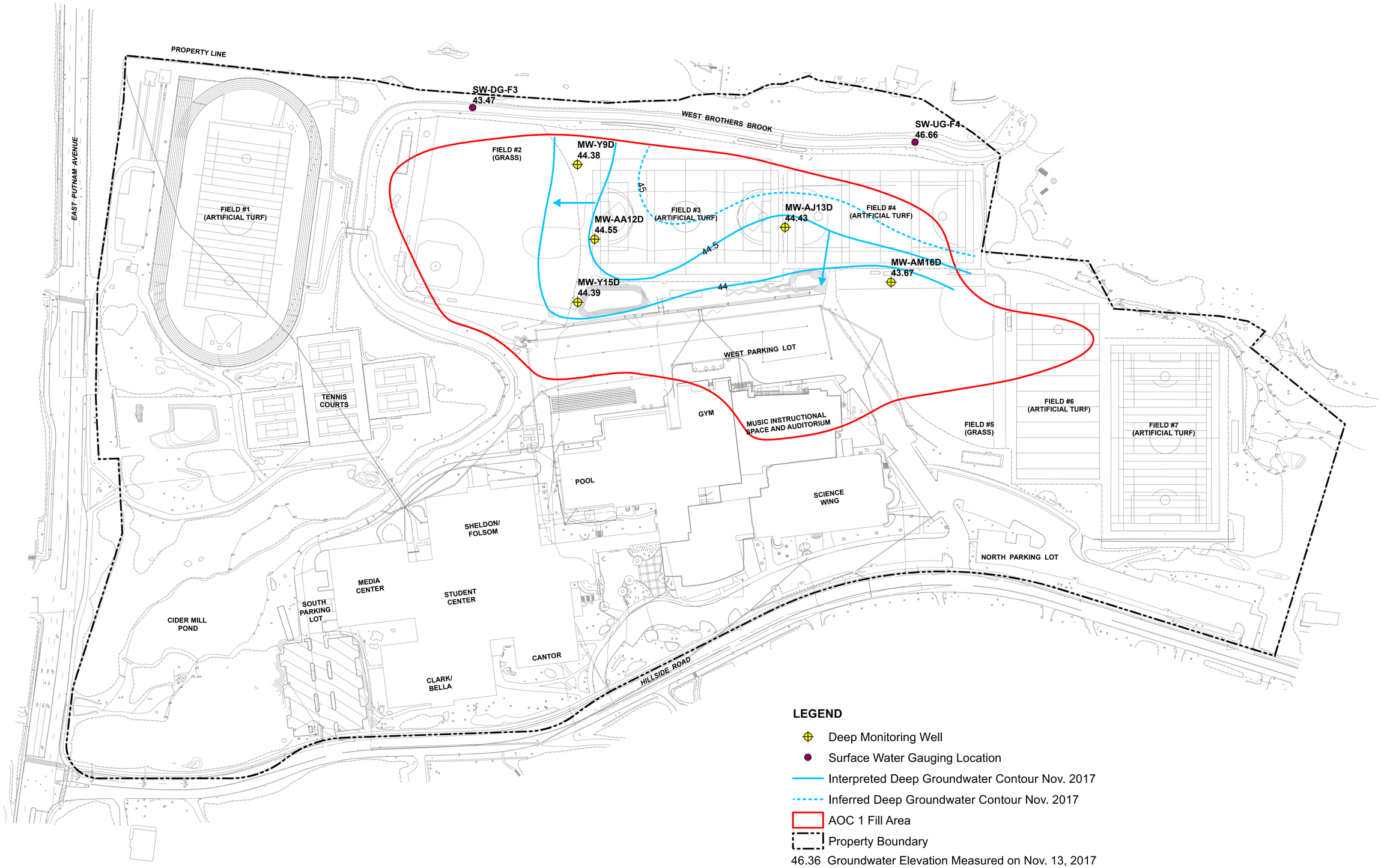
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 20
NOVEMBER 2017
SHALLOW OVERBURDEN GROUNDWATER CONTOURS

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: X:\60432356 Greenwich High School Remediation\900-Work\GIS\MXD\ArcHydro Report GPK Edits\Figure 20_November 2017 Contours.mxd



GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

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ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

AECOM

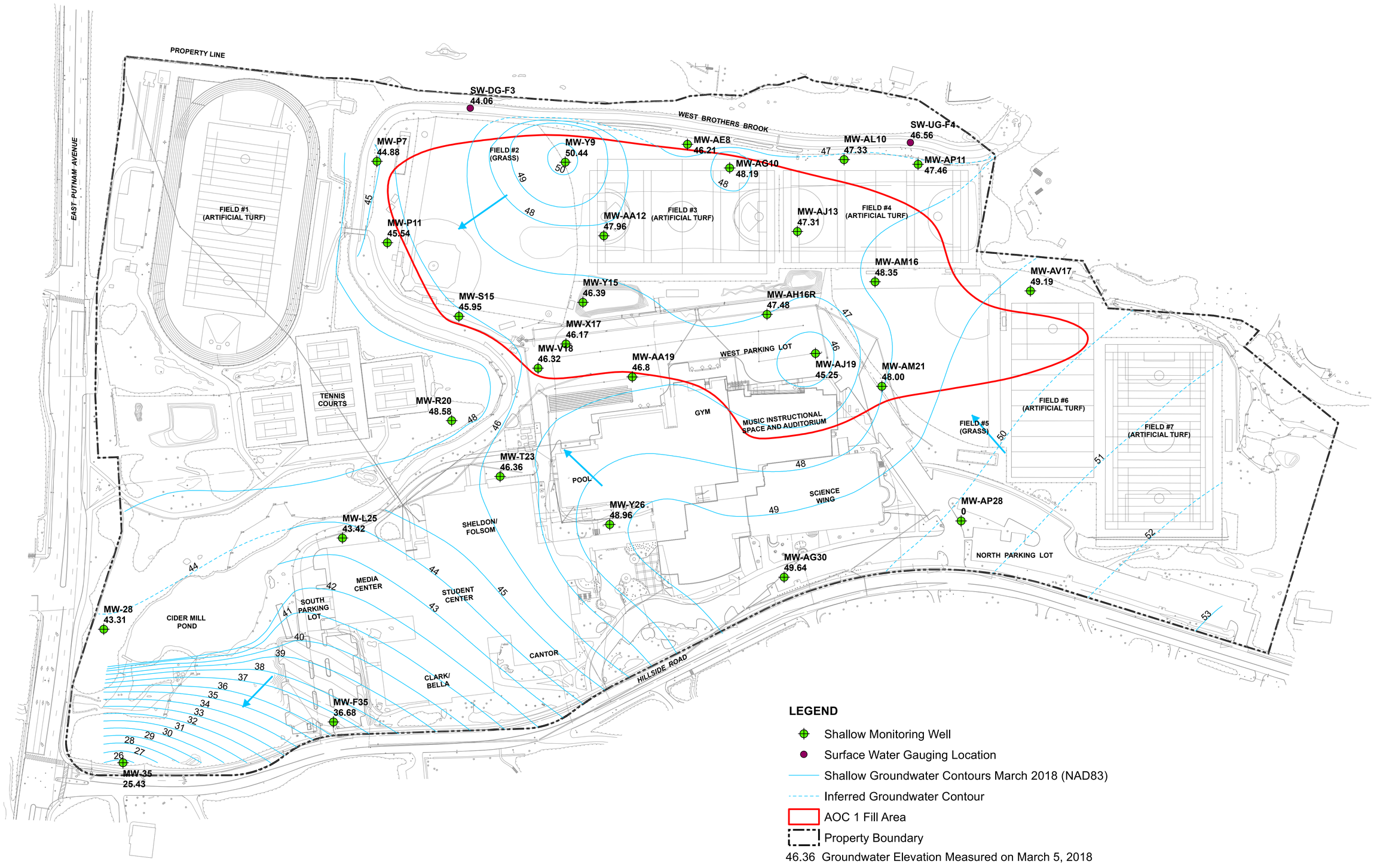
N

SCALE:
1" = 80'
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 21
NOVEMBER 2017
DEEP OVERBURDEN GROUNDWATER CONTOURS

JOB 60225155
FILE NO.
CAD FILE
SHEET



LEGEND

- Shallow Monitoring Well
- Surface Water Gauging Location
- Shallow Groundwater Contours March 2018 (NAD83)
- Inferred Groundwater Contour
- AOC 1 Fill Area
- Property Boundary
- 46.36 Groundwater Elevation Measured on March 5, 2018

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

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SCALE:

1" = 80'

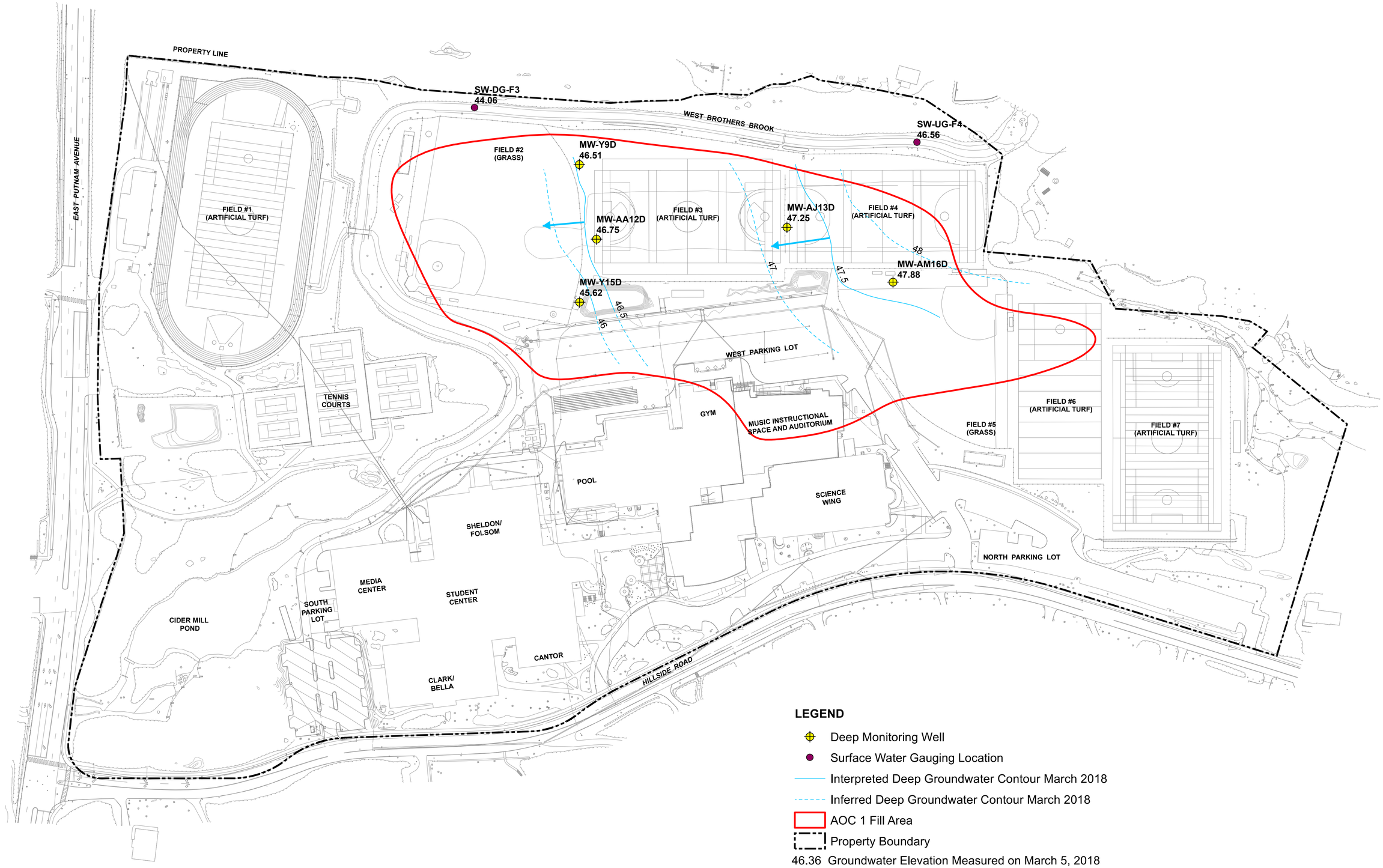
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 22
MARCH 2018
SHALLOW OVERBURDEN GROUNDWATER CONTOURS

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: X:\60432366 Greenwich High School Remediation\900-Work\GIS\MXD\e-Hydro Report GPK Edits\Figure 22_March 2018 Contours.mxd



Path: X:\60432356 Greenwich High School Remediation\900-Work\GIS\MXDs\Hydro Report GPK Edits\Figure 23_March 2018 Deep Contours.mxd

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

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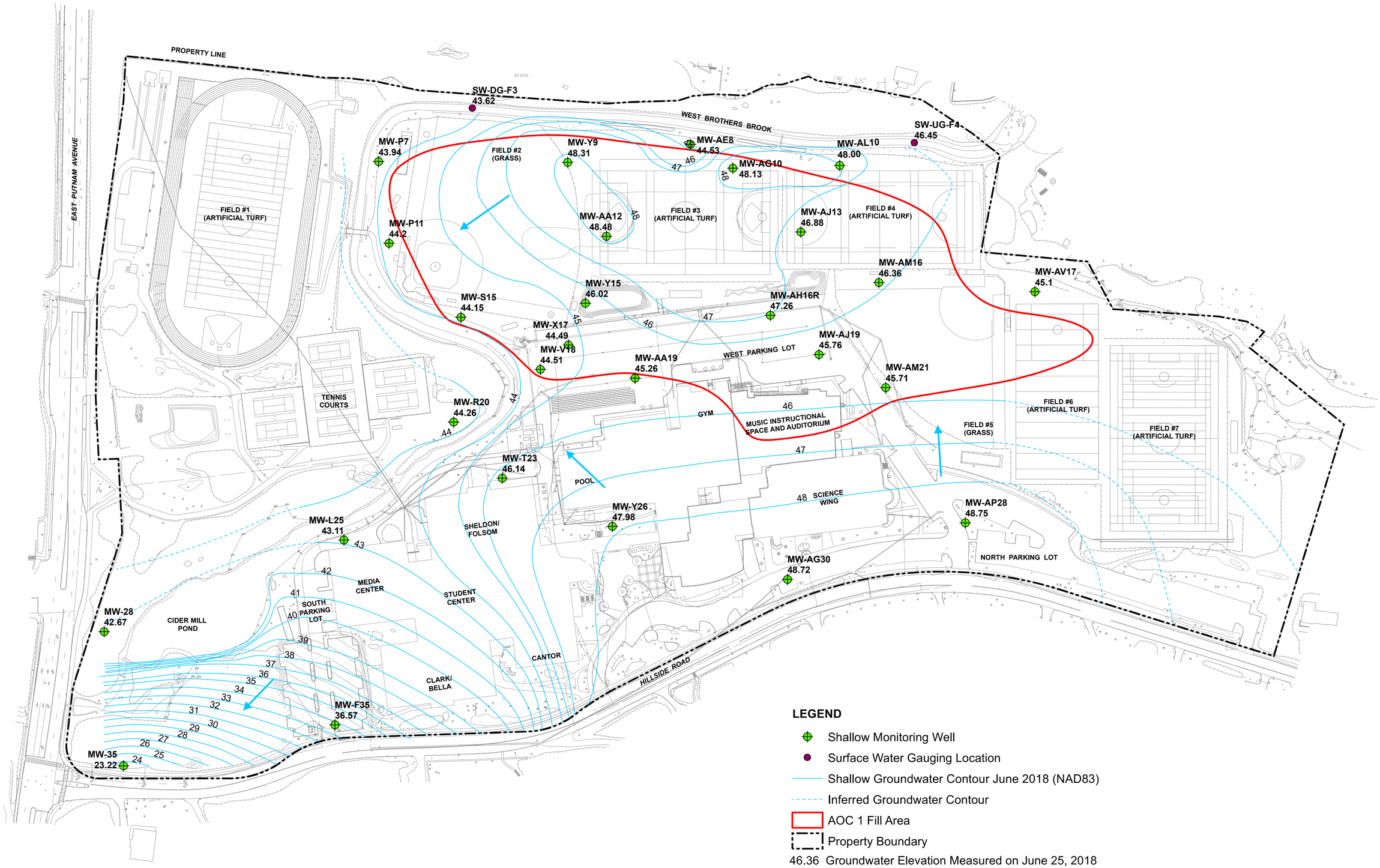
N

SCALE:
1" = 80'
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 23
MARCH 2018
DEEP OVERBURDEN GROUNDWATER CONTOURS

JOB 60225155
FILE NO.
CAD FILE
SHEET



LEGEND

- Shallow Monitoring Well
- Surface Water Gauging Location
- Shallow Groundwater Contour June 2018 (NAD83)
- Inferred Groundwater Contour
- AOC 1 Fill Area
- Property Boundary
- 46.36 Groundwater Elevation Measured on June 25, 2018

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION

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(860) 263-5800
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AECOM

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SCALE:

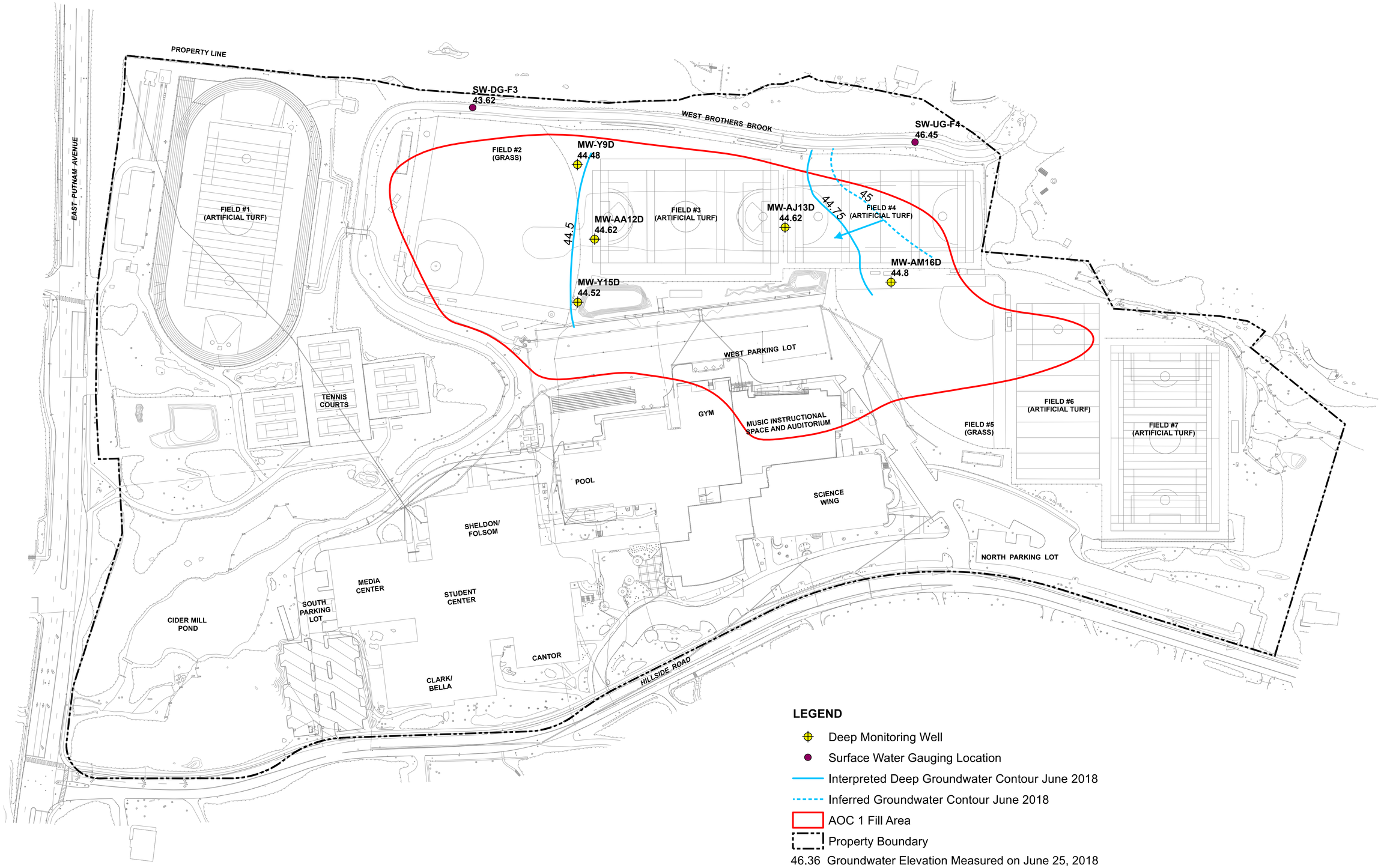
1" = 80' 0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 24
JUNE 2018
SHALLOW OVERBURDEN GROUNDWATER CONTOURS

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: X:\60432366 Greenwich High School Remediation\900-Work\GIS\MXD\Hydro Report GPR E\dss\Figure 24_June 2018 Contours.mxd



Path: X:\60432356 Greenwich High School Remediation\900-Work\GIS\MXDs\Hydro Report GPK Edits\Figure 25_June 2018 Deep Contours.mxd

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
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ROCKY HILL, CT 06067
(860) 263-5800
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AECOM

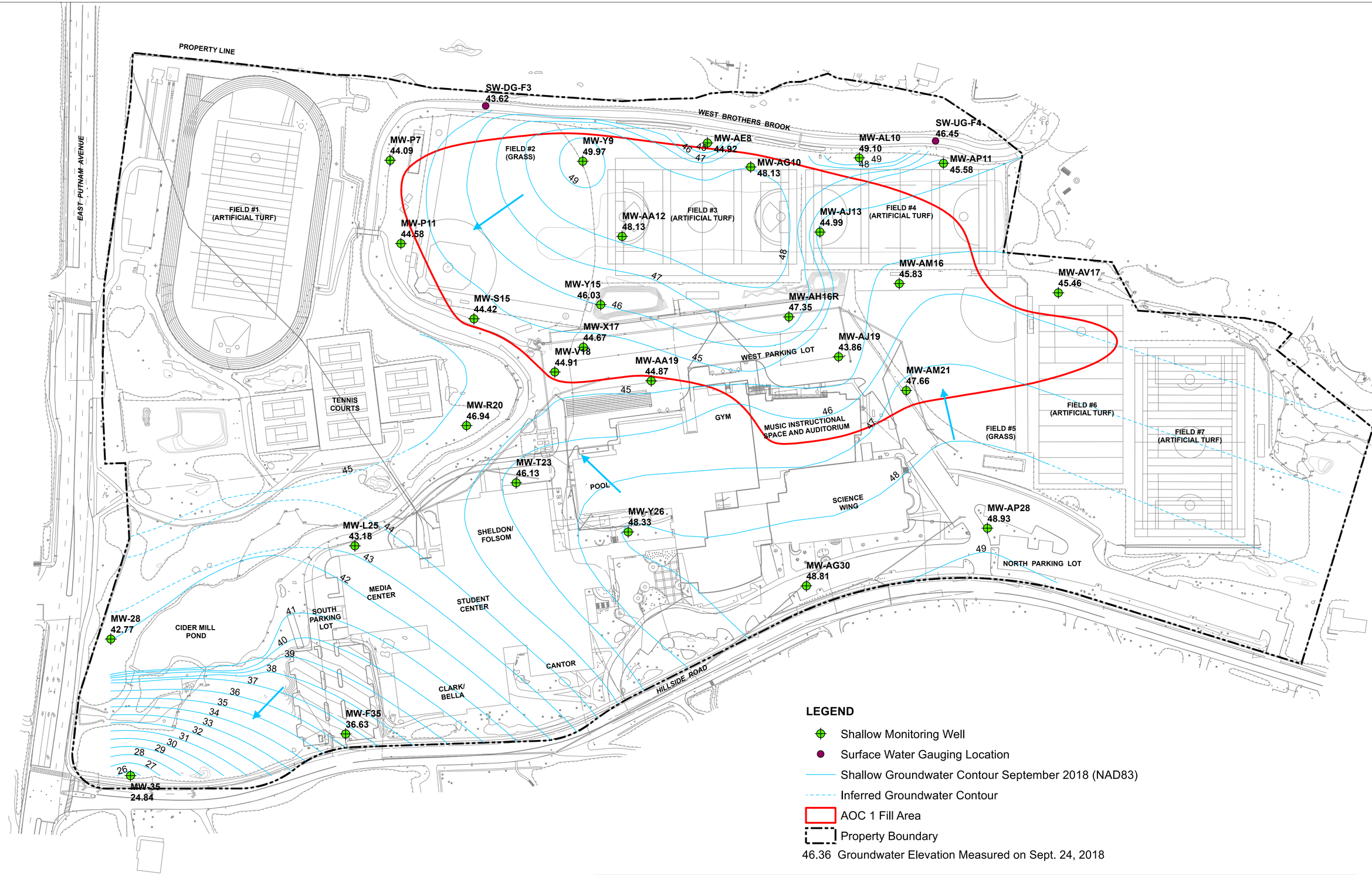
N

SCALE:
1" = 80'
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 25
JUNE 2018
DEEP OVERBURDEN GROUNDWATER CONTOURS

JOB 60225155
FILE NO.
CAD FILE
SHEET



LEGEND

- Shallow Monitoring Well
- Surface Water Gauging Location
- Shallow Groundwater Contour September 2018 (NAD83)
- Inferred Groundwater Contour
- AOC 1 Fill Area
- Property Boundary
- 46.36 Groundwater Elevation Measured on Sept. 24, 2018

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
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ROCKY HILL, CT 06067
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www.aecom.com

SCALE:
1" = 80'
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 26
SEPTEMBER 2018
SHALLOW OVERBURDEN GROUNDWATER CONTOURS

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: K:\60432366 Greenwich High School Remediation\900-Work\GIS\MXDs\Hydro Report (GPK Edits)\Figure 26_September 2018 Contours.mxd

PROPERTY LINE

EAST PUTNAM AVENUE

SW-DG-F3
43.62

WEST BROTHERS BROOK

SW-UG-F4
46.45

FIELD #1
(ARTIFICIAL TURF)

FIELD #2
(GRASS)

MW-Y9D
44.79

MW-AA12D
44.95

FIELD #3
(ARTIFICIAL TURF)

MW-AJ13D
44.95

FIELD #4
(ARTIFICIAL TURF)

44.5

45.5

45

MW-AM16D
45.24

MW-AH16D
45.16

WEST PARKING LOT

TENNIS
COURTS

GYM

MUSIC INSTRUCTIONAL
SPACE AND AUDITORIUM

FIELD #5
(GRASS)

FIELD #6
(ARTIFICIAL TURF)

FIELD #7
(ARTIFICIAL TURF)

POOL

SCIENCE
WING

SHELDON/
FOLSOM

NORTH PARKING LOT

MW-BB32
0

MEDIA
CENTER

STUDENT
CENTER

SOUTH
PARKING
LOT

CIDER MILL
POND

CANTOR

CLARK/
BELLA

HILLSIDE ROAD

LEGEND

- Deep Monitoring Well
- Surface Water Gauging Location
- Interpreted Deep Groundwater Contours Sept 2018
- Inferred Groundwater Contours Sept 2018
- AOC 1 Fill Area
- Property Boundary
- 46.36 Groundwater Elevation Measured on Sept. 24, 2018

Path: X:\60432366 Greenwich High School Remediation\600-Work\639-MXD\ehr\Hydro Report CIP\Ei\Figure 27_Sept 2018 Deep Contours.mxd

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

SCALE:

1" = 80'

0 40 80 160 240 Feet

SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

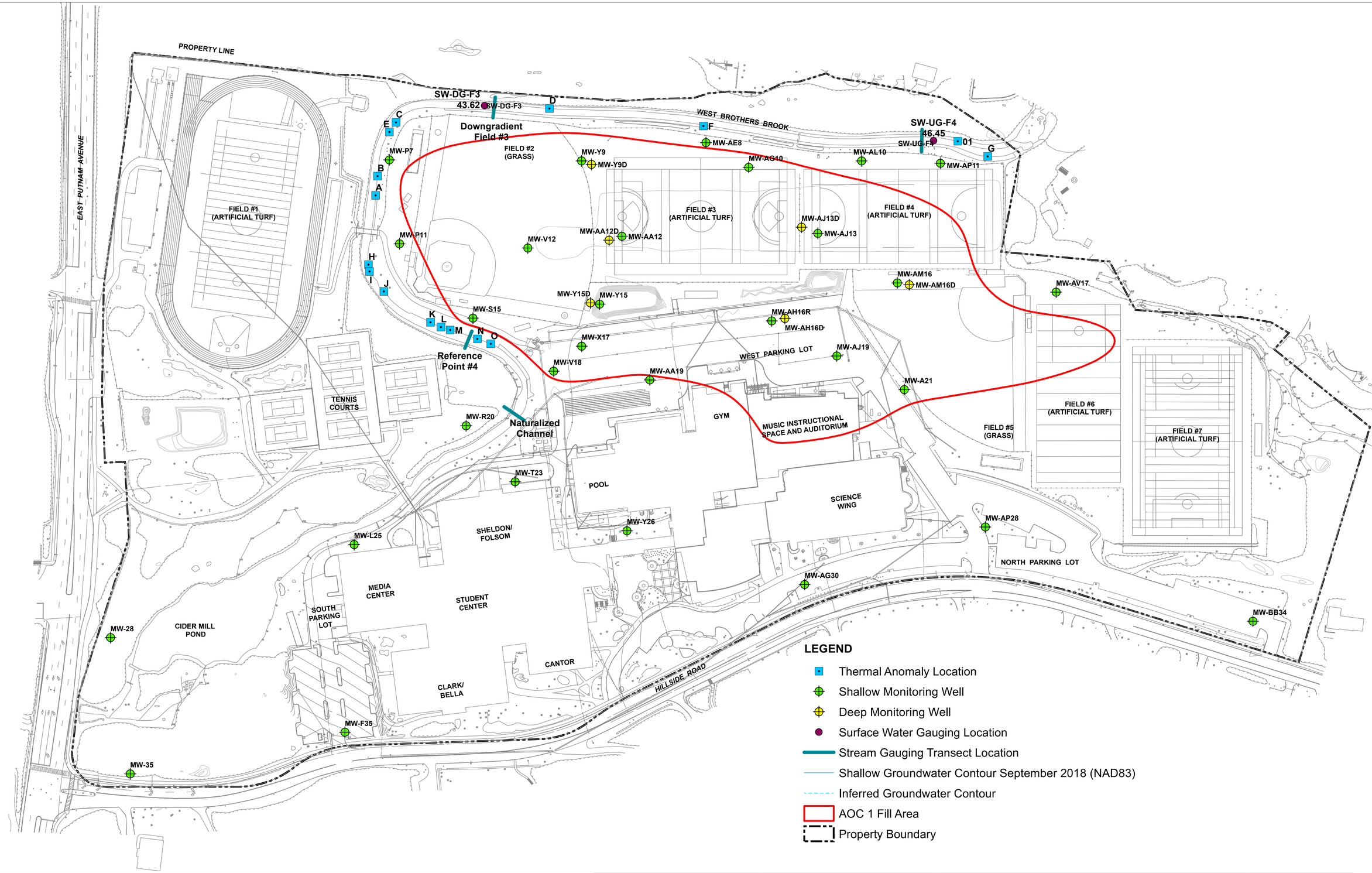
FIGURE 27
SEPTEMBER 2018
DEEP OVERBURDEN GROUNDWATER CONTOURS

JOB 60225155

FILE NO.

CAD FILE

SHEET



Path: K:\60432366 Greenwich High School Remediation\900-Work\GIS\MXDs\Hydro Report (GPK Edits)\Figure 28_TIR Locations.mxd

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

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ROCKY HILL, CT 06067
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AECOM

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SCALE:

1" = 80'

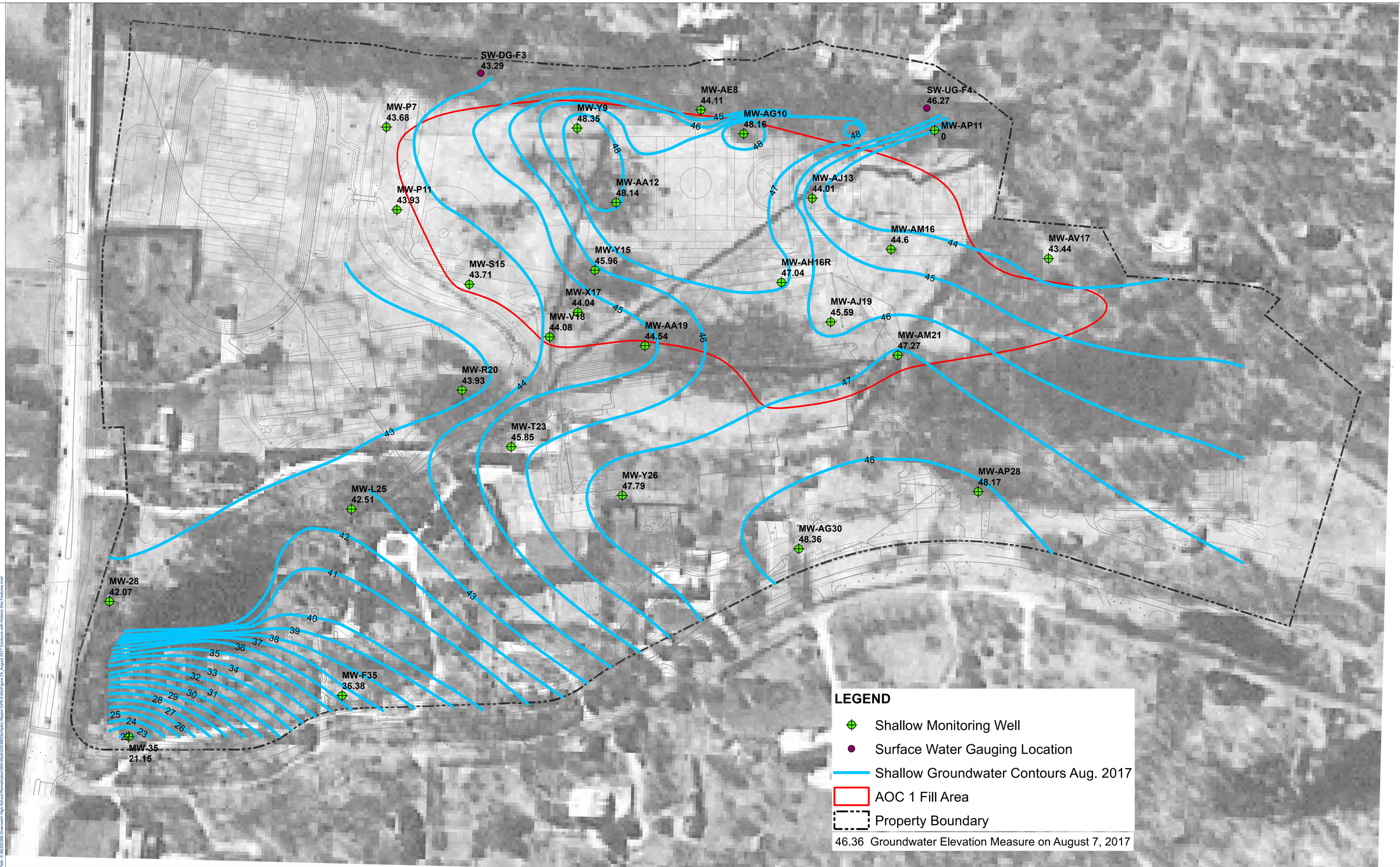
0 40 80 160 240 Feet

SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 28
SEPTEMBER 2018
THERMAL INFRARED ANOMALY LOCATIONS AND
STREAM DISCHARGE/GAUGING TRANSECT LOCATIONS

JOB 60225155
FILE NO.
CAD FILE
SHEET



Path: X:\60432266 Greenwich High School Remediation\900-Work\GIS\MXDs\Hydro Report GPK Edits\Figure 29_August 2017 Contours with Historic Site Features.mxd

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

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ROCKY HILL, CT 06067
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AECOM

N

SCALE:
1" = 80'
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 29
AUGUST 2017
SHALLOW OVERBURDEN GROUNDWATER CONTOURS
AND HISTORIC SITE FEATURES (1934 AERIAL)

JOB 60225155
FILE NO.
CAD FILE
SHEET

Tables

Table 1
Stormwater Outfall Anlytical Data
Artificial Turf Fields #3 and #4

Greenwich High School

Parameter	DGF3-092618-1	UGF4-092618-1	UGF4-092618-2 (duplicate)
Sampling Date	9/26/2018 4:15:00 PM	9/26/2018 4:25:00 PM	9/26/2018 4:30:00 PM
Laboratory Report Number	18I1259	18I1259	18I1259
PCH Homologs (µg/L)			
Monochlorobiphenyls	ND (0.0010)	**0.0027**	**0.0019**
Dichlorobiphenyls	ND (0.0010)	**0.0047**	**0.0028**
Trichlorobiphenyls	**0.0017**	**0.025**	**0.024**
Tetrachlorobiphenyls	**0.013**	**0.054**	**0.050**
Pentachlorobiphenyls	**0.003**	**0.022**	**0.022**
Hexachlorobiphenyls	ND (0.0020)	**0.0027**	ND (0.0020)
Heptachlorobiphenyls	ND (0.0030)	ND (0.0030)	ND (0.0030)
Octachlorobiphenyls	ND (0.0030)	ND (0.0030)	ND (0.0030)
Nonachlorobiphenyls	ND (0.0050)	ND (0.0050)	ND (0.0050)
Decachlorobiphenyl	ND (0.0050)	ND (0.0050)	ND (0.0050)
Total Polychlorinated biphenyls	**0.018**	**0.111**	**0.101**

Table 2
Pond Water Analytical Results

Greenwich High School

Parameter	RSR Criteria		Sample Location	
	GA GWPC	SWPC	East Puddle (near Y15D)	West Puddle (near Y9)
Sampling Date			2/8/2019	2/8/2019
Sample Depth			Surface	Surface
Laboratory Report Number			19B0655	19B0655
PCB Homologs (µg/L)				
Monochlorobiphenyls	NE	NE	ND (0.0010)	ND (0.0010)
Dichlorobiphenyls	NE	NE	ND (0.0010)	ND (0.0010)
Trichlorobiphenyls	NE	NE	0.0030	ND (0.0010)
Tetrachlorobiphenyls	NE	NE	0.013	0.0061
Pentachlorobiphenyls	NE	NE	0.0084	0.0083
Hexachlorobiphenyls	NE	NE	0.0022	0.0030
Heptachlorobiphenyls	NE	NE	ND (0.0030)	ND (0.0030)
Octachlorobiphenyls	NE	NE	ND (0.0030)	ND (0.0030)
Nonachlorobiphenyls	NE	NE	ND (0.0050)	ND (0.0050)
Decachlorobiphenyl	NE	NE	ND (0.0050)	ND (0.0050)
Total Polychlorinated biphenyls	0.5	0.5	0.027	0.017

Notes:
Bold result = Analyte detected above reporting limit.
1. ND = Not Detected.
2. NE = Criterion has not been established for this analyte.

Table 3
Groundwater Analytical Results - April 2017

Greenwich High School

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-28 MW-28-20170411-1 4/11/2017 17D0505	MW-35 MW-35-20170411-1 4/11/2017 17D0505	MW-AA12 MW-AA12-20170411-1 4/11/2017 17D0505	MW-AA19 MW-AA19-20170413-1 4/13/2017 17D0656	MW-AE8 MW-AE8-20170411-1 4/11/2017 17D0409	MW-AG10 MW-AG10-20170411-1 4/11/2017 17D0409	MW-AG10 DUP MW-AG10-20170411-2 4/11/2017 17D0409	MW-AG30 MW-AG30-20170412-1 4/12/2017 17D0505	MW-AH16R MW-AH16R-20170412-1 4/12/2017 17D0505	MW-AJ13 MW-AJ13-20170411-1 4/11/2017 17D0409	MW-AJ19 MW-AJ19-20170412-1 4/12/2017 17D0656
PAHs (ug/L)													
2-Methylnaphthalene	NE	NE	< 0.05	< 0.05	**1.4**	NS	< 0.05	NS	NS	< 0.05	**3.4**	< 0.05	NS
Acenaphthene	NE	NE	< 0.05	< 0.05	**6.4**	NS	< 0.05	NS	NS	< 0.05	**0.46**	< 0.05	NS
Acenaphthylene	420	0.3	< 0.05	< 0.05	< 0.05	NS	< 0.05	NS	NS	< 0.05	< 0.05	< 0.05	NS
Anthracene	2000	1100000	< 0.05	< 0.05	**0.58**	NS	< 0.05	NS	NS	< 0.05	**0.23**	< 0.05	NS
Benzo(a)anthracene	0.06	0.3	< 0.05	< 0.05	< 0.05	NS	< 0.05	NS	NS	< 0.05	< 0.05	< 0.05	NS
Benzo(a)pyrene	0.2	0.3	< 0.05	< 0.05	< 0.05	NS	< 0.05	NS	NS	< 0.05	< 0.05	< 0.05	NS
Benzo(b)fluoranthene	0.08	0.3	< 0.05	< 0.05	< 0.05	NS	< 0.05	NS	NS	< 0.05	< 0.05	< 0.05	NS
Benzo(g,h,i)perylene	NE	NE	< 0.05	< 0.05	< 0.05	NS	< 0.05	NS	NS	< 0.05	< 0.05	< 0.05	NS
Benzo(k)fluoranthene	0.5	0.3	< 0.05	< 0.05	< 0.05	NS	< 0.05	NS	NS	< 0.05	< 0.05	< 0.05	NS
Chrysene	NE	NE	< 0.05	< 0.05	< 0.05	NS	< 0.05	NS	NS	< 0.05	< 0.05	< 0.05	NS
Dibenzo(a,h)anthracene	NE	NE	< 0.01	< 0.01	< 0.01	NS	< 0.01	NS	NS	< 0.01	< 0.01	< 0.01	NS
Fluoranthene	280	3700	< 0.05	< 0.05	**0.42**	NS	< 0.05	NS	NS	< 0.05	**0.11**	< 0.05	NS
Fluorene	280	140000	< 0.05	< 0.05	**3.4**	NS	< 0.05	NS	NS	< 0.05	**0.27**	< 0.05	NS
Indeno(1,2,3-cd)pyrene	NE	NE	< 0.05	< 0.05	< 0.05	NS	< 0.05	NS	NS	< 0.05	< 0.05	< 0.05	NS
Naphthalene	280	NE	< 0.10	< 0.10	**8.2**	NS	< 0.10	NS	NS	< 0.10	**5.5**	< 0.10	NS
Phenanthrene	200	0.077	< 0.05	< 0.05	**2.9**	NS	< 0.05	NS	NS	< 0.05	**0.45**	< 0.05	NS
Pyrene	200	110000	< 0.05	< 0.05	**0.23**	NS	< 0.05	NS	NS	< 0.05	< 0.05	< 0.05	NS
Metals (mg/L)													
Antimony	0.006	86	< 0.005	< 0.005	< 0.005	NS	< 0.005	NS	NS	< 0.005	< 0.005	< 0.005	NS
Arsenic	0.05	0.004	< 0.004	< 0.004	< 0.004	NS	< 0.004	NS	NS	< 0.004	< 0.004	**0.030**	NS
Barium	1	NE	**0.043**	**0.401**	**0.675**	NS	**0.174**	NS	NS	**0.523**	**0.996**	**0.128**	NS
Beryllium	0.004	0.004	< 0.001	< 0.001	< 0.001	NS	< 0.001	NS	NS	**0.002**	< 0.001	< 0.001	NS
Cadmium	0.005	0.006	< 0.001	< 0.001	< 0.001	NS	< 0.001	NS	NS	**0.002**	< 0.001	< 0.001	NS
Chromium	0.05	NE	< 0.001	**0.002**	< 0.001	NS	**0.002**	NS	NS	**0.033**	**0.003**	**0.001**	NS
Copper	1.3	0.048	< 0.005	**0.016**	< 0.005	NS	< 0.005	NS	NS	**0.029**	< 0.005	< 0.005	NS
Lead	0.015	0.013	< 0.002	**0.005**	< 0.002	NS	< 0.002	NS	NS	**0.013**	< 0.002	**0.002**	NS
Mercury	0.002	0.0004	< 0.0002	< 0.0002	< 0.0002	NS	< 0.0002	NS	NS	< 0.0002	< 0.0002	< 0.0002	NS
Nickel	0.1	0.88	< 0.001	**0.005**	**0.001**	NS	**0.002**	NS	NS	**0.019**	**0.003**	**0.016**	NS
Selenium	0.05	0.05	< 0.010	< 0.010	< 0.010	NS	< 0.010	NS	NS	< 0.010	< 0.010	< 0.010	NS
Silver	0.036	0.012	< 0.001	< 0.001	< 0.001	NS	< 0.001	NS	NS	< 0.001	< 0.001	< 0.001	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.005	0.063	< 0.0005	< 0.0005	< 0.0005	NS	< 0.0005	NS	NS	< 0.0005	< 0.0005	< 0.0005	NS
Vanadium	0.05	NE	< 0.002	**0.003**	< 0.002	NS	**0.002**	NS	NS	**0.042**	**0.007**	< 0.002	NS
Zinc	5	0.123	< 0.002	**0.003**	**0.028**	NS	**0.007**	NS	NS	**0.079**	**0.027**	**0.716**	NS
PCB Homologs (ug/L)													
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0050	< 0.0050	< 0.0052	< 0.0055	< 0.0050	< 0.0052	< 0.0051	< 0.0051	< 0.0052	< 0.0051	< 0.0050
Dichlorobiphenyl	NE	NE	< 0.0010	< 0.0010	**0.98**	< 0.0011	< 0.0010	**0.031**	**0.021**	< 0.0010	**11**	**1.7**	< 0.0010
Heptachlorobiphenyl	NE	NE	< 0.0030	< 0.0030	< 0.0031	< 0.0033	< 0.0030	< 0.0031	< 0.0031	< 0.0031	< 0.0031	< 0.0031	< 0.0030
Hexachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	< 0.0021	< 0.0022	< 0.0020	< 0.0021	< 0.0020	< 0.0020	**0.0027**	< 0.0020	< 0.0020
Monochlorobiphenyl	NE	NE	< 0.0010	< 0.0010	**0.094**	< 0.0011	< 0.0010	< 0.0010	< 0.0010	< 0.0010	**11**	**0.024**	< 0.0010
Nonachlorobiphenyl	NE	NE	< 0.0050	< 0.0050	< 0.0052	< 0.0055	< 0.0050	< 0.0052	< 0.0051	< 0.0051	< 0.0052	< 0.0051	< 0.0050
Octachlorobiphenyl	NE	NE	< 0.0030	< 0.0030	< 0.0031	< 0.0033	< 0.0030	< 0.0031	< 0.0031	< 0.0031	< 0.0031	< 0.0031	< 0.0030
Pentachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	**0.016**	< 0.0022	< 0.0020	< 0.0021	< 0.0020	< 0.0020	**0.033**	**0.029**	< 0.0020
Tetrachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	**0.12**	< 0.0022	< 0.0020	**0.033**	**0.025**	< 0.0020	**0.35**	**0.34**	< 0.0020
Trichlorobiphenyl	NE	NE	< 0.0010	< 0.0010	**0.45**	< 0.0011	< 0.0010	**0.039**	**0.027**	< 0.0010	**2.2**	**1.6**	< 0.0010
Total PCB Homologues	0.5	0.5	< 0.0050	< 0.0050	**1.66**	< 0.0055	< 0.0050	**0.103**	**0.073**	< 0.0051	**24.5857**	**3.693**	< 0.0050

Notes:
This is a summary table. Only detected compounds are presented.
Bold = Detected above reporting limit
Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CTDEEP approval to implement. 0.25 mg/l is the proposed GWPC.
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Action Level set by the Connecticut Department of Public Health.

Table 3
Groundwater Analytical Results - April 2017

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-AM16 MW-AM16-20170411-1 4/11/2017 17D0505	MW-AM21 MW-AM21-20170412-1 4/12/2017 17D0656	MW-AP11 MW-AP11-20170412-1 4/12/2017 17D0656	MW-AP28 MW-AP28-20170412-1 4/12/2017 17D0505	MW-AV17 MW-AV17-20170411-1 4/11/2017 17D0505	MW-BB34 MW-BB34-20170412-1 4/12/2017 17D0505	MW-F35 MW-F35-20170413-1 4/13/2017 17D0656	MW-L25 MW-L25-20170412 4/12/2017 17D0656	MW-P11 MW-P11-20170411-1 4/11/2017 17D0409	MW-P7 MW-P7-20170411-1 4/11/2017 17D0409	MW-P7 DUP MW-P7-20170411-2 4/10/2017 GBY02577
PAHs (ug/L)													
2-Methylnaphthalene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Acenaphthene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Acenaphthylene	420	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Anthracene	2000	1100000	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Benzo(a)anthracene	0.06	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Benzo(a)pyrene	0.2	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Benzo(b)fluoranthene	0.08	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Benzo(g,h,i)perylene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Benzo(k)fluoranthene	0.5	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Chrysene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Dibenzo(a,h)anthracene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.01	< 0.01
Fluoranthene	280	3700	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Fluorene	280	140000	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Naphthalene	280	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.10	< 0.10
Phenanthrene	200	0.077	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Pyrene	200	110000	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	< 0.05
Metals (mg/L)													
Antimony	0.006	86	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.005	NS
Arsenic	0.05	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.004	NS
Barium	1	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.096**	NS
Beryllium	0.004	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS
Cadmium	0.005	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS
Chromium	0.05	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS
Copper	1.3	0.048	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.005	NS
Lead	0.015	0.013	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.002	NS
Mercury	0.002	0.0004	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0002	NS
Nickel	0.1	0.88	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.002**	NS
Selenium	0.05	0.05	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.010	NS
Silver	0.036	0.012	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0005	NS
Vanadium	0.05	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.002	NS
Zinc	5	0.123	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.002	NS
PCB Homologs (ug/L)													
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0051	< 0.0051	< 0.0052	< 0.0052	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0053	< 0.0050	NS
Dichlorobiphenyl	NE	NE	**0.059**	**0.0072**	**0.0014**	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0011	< 0.0010	NS
Heptachlorobiphenyl	NE	NE	< 0.0030	< 0.0031	< 0.0031	< 0.0031	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0032	< 0.0030	NS
Hexachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	< 0.0021	< 0.0021	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0021	< 0.0020	NS
Monochlorobiphenyl	NE	NE	**0.0076**	< 0.0010	**0.0029**	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0011	< 0.0010	NS
Nonachlorobiphenyl	NE	NE	< 0.0051	< 0.0051	< 0.0052	< 0.0052	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0053	< 0.0050	NS
Octachlorobiphenyl	NE	NE	< 0.0030	< 0.0031	< 0.0031	< 0.0031	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0032	< 0.0030	NS
Pentachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	< 0.0021	< 0.0021	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0021	< 0.0020	NS
Tetrachlorobiphenyl	NE	NE	**0.023**	**0.015**	< 0.0021	< 0.0021	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0021	< 0.0020	NS
Trichlorobiphenyl	NE	NE	**0.036**	**0.022**	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0011	< 0.0010	NS
Total PCB Homologues	0.5	0.5	**0.1256**	**0.0442**	**0.0043**	< 0.0052	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0053	< 0.0050	NS

Notes:
This is a summary table. Only detected compounds are presented.
Bold = Detected above reporting limit
Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CT
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Actio

Table 3
Groundwater Analytical Results - April 2017

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-R20 MW-R20-20170412-1 4/12/2017 17D0656	MW-S15 MW-515-20170410-1 4/10/2017 17D0409	MW-S15 MW-515-20170410-2 4/10/2017 17D0409	MW-T23 MW-T23-20170412-1 4/12/2017 17D0656	MW-V12 MW-V12-20170412-1 4/12/2017 17D0505	MW-V18 MW-V18-20170413-1 4/13/2017 17D0656	MW-X17 MW-X17-20170410-1 4/10/2017 17D0409	MW-Y15 MW-Y15-20170412-1 4/12/2017 17D0505	MW-Y26 MW-Y26-20170412-1 4/12/2017 17D0656	MW-Y9 MW-Y9-20170413-1 4/13/2017 17D0656
PAHs (ug/L)												
2-Methylnaphthalene	NE	NE	NS	< 0.05	NS	NS	NS	NS	NS	**0.06**	NS	NS
Acenaphthene	NE	NE	NS	< 0.05	NS	NS	NS	NS	NS	**0.35**	NS	NS
Acenaphthylene	420	0.3	NS	< 0.05	NS	NS	NS	NS	NS	< 0.05	NS	NS
Anthracene	2000	1100000	NS	< 0.05	NS	NS	NS	NS	NS	**0.08**	NS	NS
Benzo(a)anthracene	0.06	0.3	NS	< 0.05	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(a)pyrene	0.2	0.3	NS	< 0.05	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(b)fluoranthene	0.08	0.3	NS	< 0.05	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(g,h,i)perylene	NE	NE	NS	< 0.05	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(k)fluoranthene	0.5	0.3	NS	< 0.05	NS	NS	NS	NS	NS	< 0.05	NS	NS
Chrysene	NE	NE	NS	< 0.05	NS	NS	NS	NS	NS	< 0.05	NS	NS
Dibenzo(a,h)anthracene	NE	NE	NS	< 0.01	NS	NS	NS	NS	NS	< 0.01	NS	NS
Fluoranthene	280	3700	NS	< 0.05	NS	NS	NS	NS	NS	< 0.05	NS	NS
Fluorene	280	140000	NS	< 0.05	NS	NS	NS	NS	NS	**0.18**	NS	NS
Indeno(1,2,3-cd)pyrene	NE	NE	NS	< 0.05	NS	NS	NS	NS	NS	< 0.05	NS	NS
Naphthalene	280	NE	NS	< 0.10	NS	NS	NS	NS	NS	< 0.10	NS	NS
Phenanthrene	200	0.077	NS	< 0.05	NS	NS	NS	NS	NS	< 0.05	NS	NS
Pyrene	200	110000	NS	< 0.05	NS	NS	NS	NS	NS	< 0.05	NS	NS
Metals (mg/L)												
Antimony	0.006	86	NS	< 0.005	< 0.005	NS	NS	NS	NS	< 0.005	NS	NS
Arsenic	0.05	0.004	NS	< 0.004	< 0.004	NS	NS	NS	NS	< 0.004	NS	NS
Barium	1	NE	NS	**0.109**	**0.113**	NS	NS	NS	NS	**0.490**	NS	NS
Beryllium	0.004	0.004	NS	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS
Cadmium	0.005	0.006	NS	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS
Chromium	0.05	NE	NS	< 0.001	< 0.001	NS	NS	NS	NS	**0.002**	NS	NS
Copper	1.3	0.048	NS	< 0.005	< 0.005	NS	NS	NS	NS	< 0.005	NS	NS
Lead	0.015	0.013	NS	< 0.002	< 0.002	NS	NS	NS	NS	**0.004**	NS	NS
Mercury	0.002	0.0004	NS	< 0.0002	< 0.0002	NS	NS	NS	NS	< 0.0002	NS	NS
Nickel	0.1	0.88	NS	< 0.001	< 0.001	NS	NS	NS	NS	**0.004**	NS	NS
Selenium	0.05	0.05	NS	< 0.010	< 0.010	NS	NS	NS	NS	< 0.010	NS	NS
Silver	0.036	0.012	NS	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.005	0.063	NS	< 0.0005	< 0.0005	NS	NS	NS	NS	< 0.0005	NS	NS
Vanadium	0.05	NE	NS	**0.003**	**0.003**	NS	NS	NS	NS	< 0.002	NS	NS
Zinc	5	0.123	NS	**0.003**	**0.004**	NS	NS	NS	NS	**0.008**	NS	NS
PCB Homologs (ug/L)												
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0050	< 0.0056	< 0.0056	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0051	< 0.0056	< 0.0051
Dichlorobiphenyl	NE	NE	< 0.0010	**0.0044**	**0.0064**	< 0.0010	**0.0012**	**0.0091**	< 0.0010	**4.2**	< 0.0011	< 0.0010
Heptachlorobiphenyl	NE	NE	< 0.0030	< 0.0033	< 0.0033	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0033	< 0.0031
Hexachlorobiphenyl	NE	NE	< 0.0020	< 0.0022	< 0.0022	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0022	< 0.0020
Monochlorobiphenyl	NE	NE	**0.0024**	< 0.0011	< 0.0011	< 0.0010	< 0.0010	**0.0023**	< 0.0010	**3.3**	< 0.0011	< 0.0010
Nonachlorobiphenyl	NE	NE	< 0.0050	< 0.0056	< 0.0056	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0051	< 0.0056	< 0.0051
Octachlorobiphenyl	NE	NE	< 0.0030	< 0.0033	< 0.0033	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0033	< 0.0031
Pentachlorobiphenyl	NE	NE	< 0.0020	< 0.0022	< 0.0022	< 0.0020	**0.021**	< 0.0020	< 0.0020	**0.026**	< 0.0022	< 0.0020
Tetrachlorobiphenyl	NE	NE	< 0.0020	**0.027**	**0.034**	< 0.0020	**0.057**	**0.015**	< 0.0020	**0.17**	< 0.0022	< 0.0020
Trichlorobiphenyl	NE	NE	< 0.0010	**0.025**	**0.032**	< 0.0010	**0.013**	**0.022**	< 0.0010	**0.73**	< 0.0011	< 0.0010
Total PCB Homologues	0.5	0.5	**0.0024**	**0.0564**	**0.0724**	< 0.0050	**0.0922**	**0.0484**	< 0.0050	**8.426**	< 0.0056	< 0.0051

Notes:
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Yellow highlighted cells exceed SWPC.
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GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CT
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Actio

Table 3
Groundwater Analytical Results - August 2017

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-28 MW-28-081617-1 8/16/2017 17H0897	MW-35 MW-35-081617-1 8/16/2017 17H0897	MW-AA12 MW-AA12-082417-1 8/24/2017 GBY92749	MW-AA12D MW-AA12-D-082417-1 8/24/2017 17H1571	MW-AA19 MW-AA19-081817-1 8/18/2017 17H1062	MW-AE8 MW-AE8-081617-1 8/16/2017 17H0897	MW-AG10 MW-AG10-081617-1 8/16/2017 17H0897	MW-AG30 MW-AG30-081717-1 8/17/2017 17H1062	MW-AH16R MW-AH16R-081517-1 8/15/2017 GBY85227	MW-AJ13 MW-AJ13-082917-1 8/24/2017 GBY92749	MW-AJ13D MW-AJ13D-082917-1 8/29/2017 17H1571	MW-AJ19 MW-AJ19-081717-1 8/17/2017 17H1062
PAHs (ug/L)														
2-Methylnaphthalene	NE	NE	< 0.05	< 0.05	**0.72**	NS	NS	< 0.05	NS	NS	**0.17**	< 0.05	NS	NS
Acenaphthene	NE	NE	< 0.05	< 0.05	**5.6**	NS	NS	< 0.05	NS	NS	**0.44**	< 0.05	NS	NS
Acenaphthylene	420	0.3	< 0.05	< 0.05	**0.10**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Anthracene	2000	1100000	< 0.05	< 0.05	**3.0**	NS	NS	< 0.05	NS	NS	**0.07**	< 0.05	NS	NS
Benzo(a)anthracene	0.06	0.3	< 0.05	< 0.05	**6.0**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Benzo(a)pyrene	0.2	0.3	< 0.05	< 0.05	**4.9**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Benzo(b)fluoranthene	0.08	0.3	< 0.05	< 0.05	**5.3**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Benzo(g,h,i)perylene	NE	NE	< 0.05	< 0.05	**3.5**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Benzo(k)fluoranthene	0.5	0.3	< 0.05	< 0.05	**2.9**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Chrysene	NE	NE	< 0.05	< 0.05	**4.5**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Dibenzo(a,h)anthracene	NE	NE	< 0.01	< 0.01	**1.7**	NS	NS	< 0.01	NS	NS	< 0.01	< 0.01	NS	NS
Fluoranthene	280	3700	< 0.05	< 0.05	**9.5**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Fluorene	280	140000	< 0.05	< 0.05	**3.7**	NS	NS	< 0.05	NS	NS	**0.24**	< 0.05	NS	NS
Indeno(1,2,3-cd)pyrene	NE	NE	< 0.05	< 0.05	**3.5**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Naphthalene	280	NE	< 0.1	< 0.1	**1.9**	NS	NS	< 0.1	NS	NS	**0.33**	< 0.11	NS	NS
Phenanthrene	200	0.077	< 0.05	< 0.05	**9.6**	NS	NS	< 0.05	NS	NS	**0.11**	< 0.05	NS	NS
Pyrene	200	110000	< 0.05	< 0.05	**7.8**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Metals (mg/L)														
Antimony	0.006	86	< 0.005	< 0.005	< 0.005	NS	NS	< 0.005	NS	NS	< 0.005	< 0.005	NS	NS
Arsenic	0.05	0.004	< 0.004	< 0.004	< 0.004	NS	NS	< 0.004	NS	NS	**0.044**	**0.090**	NS	NS
Barium	1	*2.2*	**0.056**	**0.481**	**0.594**	NS	NS	**0.192**	NS	NS	**1.19**	**0.068**	NS	NS
Beryllium	0.004	0.004	< 0.001	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	< 0.001	< 0.001	NS	NS
Cadmium	0.005	0.006	< 0.001	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	**0.002**	< 0.001	NS	NS
Chromium	0.05	NE	< 0.001	< 0.001	< 0.001	NS	NS	**0.001**	NS	NS	**0.017**	**0.002**	NS	NS
Copper	1.3	0.048	< 0.005	< 0.005	< 0.005	NS	NS	< 0.005	NS	NS	**0.023**	< 0.005	NS	NS
Lead	0.015	0.013	< 0.002	< 0.002	< 0.002	NS	NS	< 0.002	NS	NS	**0.012**	< 0.002	NS	NS
Mercury	0.002	0.0004	< 0.0002	< 0.0002	< 0.0002	NS	NS	< 0.0002	NS	NS	< 0.0002	< 0.0002	NS	NS
Nickel	0.1	0.88	**0.053**	**0.004**	**0.002**	NS	NS	**0.003**	NS	NS	**0.008**	**0.004**	NS	NS
Selenium	0.05	0.05	< 0.01	< 0.01	< 0.010	NS	NS	< 0.01	NS	NS	< 0.01	< 0.010	NS	NS
Silver	0.036	0.012	< 0.001	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	< 0.001	< 0.001	NS	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.005	0.063	< 0.001	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	< 0.001	< 0.001	NS	NS
Vanadium	0.05	NE	< 0.002	< 0.002	< 0.002	NS	NS	**0.003**	NS	NS	**0.046**	**0.007**	NS	NS
Zinc	5	0.123	**0.003**	< 0.002	**0.045**	NS	NS	< 0.002	NS	NS	**0.215**	**0.918**	NS	NS
PCB Homologs (ug/L)														
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0054 UJ	< 0.0054 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0054 UJ	< 0.0054 UJ	< 0.0052 UJ	< 0.0051 UJ	< 0.0052 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ
Dichlorobiphenyl	NE	NE	**0.0044 J**	< 0.0011 UJ	**0.29 J**	**0.029 J**	< 0.0011 UJ	< 0.0011 UJ	**0.046 J**	< 0.0010 UJ	**3.8 J**	**2.7 J**	**4.2 J**	< 0.0010 UJ
Heptachlorobiphenyl	NE	NE	< 0.0033 UJ	< 0.0033 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0032 UJ	< 0.0032 UJ	< 0.0031 UJ	< 0.0031 UJ	< 0.0031 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0030 UJ
Hexachlorobiphenyl	NE	NE	< 0.0022 UJ	< 0.0022 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0022 UJ	< 0.0022 UJ	< 0.0021 UJ	< 0.0020 UJ	< 0.0021 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ
Monochlorobiphenyl	NE	NE	**0.0017 J**	**0.0018 J**	**0.019 J**	**0.0053 J**	< 0.0011 UJ	< 0.0011 UJ	**0.0077 J**	< 0.0010 UJ	**5.4 J**	**0.019 J**	**1.6 J**	< 0.0010 UJ
Nonachlorobiphenyl	NE	NE	< 0.0054 UJ	< 0.0054 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0054 UJ	< 0.0054 UJ	< 0.0052 UJ	< 0.0051 UJ	< 0.0052 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ
Octachlorobiphenyl	NE	NE	< 0.0033 UJ	< 0.0033 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0032 UJ	< 0.0032 UJ	< 0.0031 UJ	< 0.0031 UJ	< 0.0031 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0030 UJ
Pentachlorobiphenyl	NE	NE	< 0.0022 UJ	< 0.0022 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0022 UJ	< 0.0022 UJ	< 0.0021 UJ	< 0.0020 UJ	**0.017 J**	**0.080 J**	**0.036 J**	< 0.0020 UJ
Tetrachlorobiphenyl	NE	NE	**0.0049 J**	< 0.0022 UJ	**0.042 J**	**0.041 J**	< 0.0022 UJ	**0.0081 J**	**0.023 J**	< 0.0020 UJ	**0.15 J**	**0.65 J**	**0.24 J**	**0.0047 J**
Trichlorobiphenyl	NE	NE	**0.0050 J**	< 0.0011 UJ	**0.15 J**	**0.067 J**	< 0.0011 UJ	**0.0019 J**	**0.032 J**	< 0.0010 UJ	**0.58 J**	**2.9 J**	**1.4 J**	**0.0074 J**
Total PCB Homologues	0.5	0.5	**0.016 J**	**0.0018 J**	**0.51 J**	**0.14 J**	< 0.0054 UJ	**0.010 J**	**0.11 J**	< 0.0051 UJ	**10 J**	**6.3 J**	**7.4 J**	**0.012 J**

Notes:
This is a summary table. Only detected compounds are presented.
Bold = Detected above reporting limit
Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CTDEEP approval to implement. 0.25 mg/l is the proposed GWPC.
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Action Level set by the Connecticut Department of Public Health.

Table 3
Groundwater Analytical Results - August 2017

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-AL10 MW-AL10-082917-1 8/29/2017 17H1571	MW-AM16 MW-AM16-082917-1 8/29/2017 17H1571	MW-AM16D MW-AM16-D-082917-1 8/29/2017 17H1571	MW-AM21 MW-AM21-081817-1 8/18/2017 17H1062	MW-AP28 MW-AP28-081717-1 8/17/2017 17H1062	MW-AV17 MW-AV17-081817-1 8/18/2017 17H1062	MW-BB34 MW-BB34-081717-1 8/17/2017 17H1062	MW-F35 MW-F35-081717-1 8/17/2017 17H1062	MW-L25 MW-L25-081617-1 8/16/2017 17H1062	MW-P11 MW-P11-081517-1 8/15/2017 17H0897	MW-P7 MW-P7-081517-1 8/15/2017 17H0897	MW-R20 MW-R20-081617-1 8/16/2017 17H1062
PAHs (ug/L)														
2-Methylnaphthalene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Acenaphthene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Acenaphthylene	420	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Anthracene	2000	1100000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Benzo(a)anthracene	0.06	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Benzo(a)pyrene	0.2	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Benzo(b)fluoranthene	0.08	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Benzo(g,h,i)perylene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Benzo(k)fluoranthene	0.5	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Chrysene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Dibenzo(a,h)anthracene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.01	NS
Fluoranthene	280	3700	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Fluorene	280	140000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Indeno(1,2,3-cd)pyrene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Naphthalene	280	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.11	NS
Phenanthrene	200	0.077	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Pyrene	200	110000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Metals (mg/L)														
Antimony	0.006	86	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.005	NS
Arsenic	0.05	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.004	NS
Barium	1	*2.2*	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.148**	NS
Beryllium	0.004	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS
Cadmium	0.005	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS
Chromium	0.05	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS
Copper	1.3	0.048	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.005	NS
Lead	0.015	0.013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.002	NS
Mercury	0.002	0.0004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0002	NS
Nickel	0.1	0.88	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.004**	NS
Selenium	0.05	0.05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.01	NS
Silver	0.036	0.012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS
Vanadium	0.05	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.002	NS
Zinc	5	0.123	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.003**	NS
PCB Homologs (ug/L)														
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0053 UJ	< 0.0051 UJ	< 0.0052 UJ	< 0.0053 UJ	< 0.0051 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0055 UJ
Dichlorobiphenyl	NE	NE	**0.011 J**	**0.0086 J**	**0.0014 J**	< 0.0011 UJ	< 0.0010 UJ	< 0.0010 UJ	< 0.0011 UJ	< 0.0010 UJ	< 0.0010 UJ	< 0.0010 UJ	< 0.0010 UJ	< 0.0011 UJ
Heptachlorobiphenyl	NE	NE	< 0.0030 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0032 UJ	< 0.0031 UJ	< 0.0031 UJ	< 0.0032 UJ	< 0.0031 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0033 UJ
Hexachlorobiphenyl	NE	NE	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0021 UJ	< 0.0020 UJ	< 0.0021 UJ	< 0.0021 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0022 UJ
Monochlorobiphenyl	NE	NE	**0.0041 J**	**0.0032 J**	< 0.0010 UJ	< 0.0011 UJ	< 0.0010 UJ	< 0.0010 UJ	< 0.0011 UJ	< 0.0010 UJ	< 0.0010 UJ	< 0.0010 UJ	< 0.0010 UJ	< 0.0011 UJ
Nonachlorobiphenyl	NE	NE	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0053 UJ	< 0.0051 UJ	< 0.0052 UJ	< 0.0053 UJ	< 0.0051 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0055 UJ
Octachlorobiphenyl	NE	NE	< 0.0030 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0032 UJ	< 0.0031 UJ	< 0.0031 UJ	< 0.0032 UJ	< 0.0031 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0033 UJ
Pentachlorobiphenyl	NE	NE	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0021 UJ	< 0.0020 UJ	< 0.0021 UJ	< 0.0021 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0022 UJ
Tetrachlorobiphenyl	NE	NE	< 0.0020 UJ	**0.022 J**	< 0.0020 UJ	< 0.0021 UJ	< 0.0020 UJ	< 0.0021 UJ	< 0.0021 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0022 UJ
Trichlorobiphenyl	NE	NE	**0.0034 J**	**0.014 J**	**0.0011 J**	< 0.0011 UJ	< 0.0010 UJ	< 0.0010 UJ	< 0.0011 UJ	< 0.0010 UJ	< 0.0010 UJ	< 0.0010 UJ	< 0.0010 UJ	< 0.0011 UJ
Total PCB Homologues	0.5	0.5	**0.019 J**	**0.048 J**	**0.0024 J**	< 0.0053 UJ	< 0.0051 UJ	< 0.0052 UJ	< 0.0053 UJ	< 0.0051 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0055 UJ

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ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CT
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Actio

Table 3
Groundwater Analytical Results - August 2017

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-R20 DUP MW-R20-081617-2 8/16/2017 17H1062	MW-S15 MW-S15-081517-1 8/15/2017 17H0897	MW-S15 DUP MW-S15-081517-2 8/15/2017 17H0897	MW-T23 MW-T23-081817-1 8/18/2017 17H1062	MW-V12 MW-V12-081517-1 8/15/2017 17H0897	MW-V18 MW-V18-081717-1 8/17/2017 17H1062	MW-X17 MW-X17-081717-1 8/17/2017 17H1062	MW-Y15 MW-Y15-082917-1 8/24/2017 GBY92749	MW-Y15D MW-Y15-D-082917-1 8/29/2017 17H1571	MW-Y26 MW-Y26-081617-1 8/16/2017 17H1062	MW-Y9 MW-Y9-082417-1 8/24/2017 GBY92749	MW-Y9D MW-Y9-D-082417-1 8/24/2017 17H1571
PAHs (ug/L)														
2-Methylnaphthalene	NE	NE	NS	< 0.05	< 0.05	NS	NS	NS	NS	**0.09**	NS	NS	< 0.05	NS
Acenaphthene	NE	NE	NS	< 0.05	< 0.05	NS	NS	NS	NS	**0.39**	NS	NS	< 0.05	NS
Acenaphthylene	420	0.3	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.06	NS	NS	< 0.05	NS
Anthracene	2000	1100000	NS	< 0.05	< 0.05	NS	NS	NS	NS	**0.07**	NS	NS	< 0.05	NS
Benzo(a)anthracene	0.06	0.3	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.06	NS	NS	< 0.05	NS
Benzo(a)pyrene	0.2	0.3	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.06	NS	NS	< 0.05	NS
Benzo(b)fluoranthene	0.08	0.3	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.06	NS	NS	< 0.05	NS
Benzo(g,h,i)perylene	NE	NE	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.06	NS	NS	< 0.05	NS
Benzo(k)fluoranthene	0.5	0.3	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.06	NS	NS	< 0.05	NS
Chrysene	NE	NE	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.06	NS	NS	< 0.05	NS
Dibenzo(a,h)anthracene	NE	NE	NS	< 0.01	< 0.01	NS	NS	NS	NS	< 0.01	NS	NS	< 0.01	NS
Fluoranthene	280	3700	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.06	NS	NS	< 0.05	NS
Fluorene	280	140000	NS	< 0.05	< 0.05	NS	NS	NS	NS	**0.19**	NS	NS	< 0.05	NS
Indeno(1,2,3-cd)pyrene	NE	NE	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.06	NS	NS	< 0.05	NS
Naphthalene	280	NE	NS	**0.11**	< 0.1	NS	NS	NS	NS	< 0.11	NS	NS	< 0.10	NS
Phenanthrene	200	0.077	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.06	NS	NS	< 0.05	NS
Pyrene	200	110000	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.06	NS	NS	< 0.05	NS
Metals (mg/L)														
Antimony	0.006	86	NS	< 0.005	< 0.005	NS	NS	NS	NS	< 0.005	NS	NS	< 0.005	NS
Arsenic	0.05	0.004	NS	< 0.004	< 0.004	NS	NS	NS	NS	< 0.004	NS	NS	< 0.004	NS
Barium	1	*2.2*	NS	**0.145**	**0.142**	NS	NS	NS	NS	**0.688**	NS	NS	**0.947**	NS
Beryllium	0.004	0.004	NS	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS	< 0.001	NS
Cadmium	0.005	0.006	NS	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS	< 0.001	NS
Chromium	0.05	NE	NS	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS	< 0.001	NS
Copper	1.3	0.048	NS	< 0.005	< 0.005	NS	NS	NS	NS	< 0.005	NS	NS	< 0.005	NS
Lead	0.015	0.013	NS	< 0.002	< 0.002	NS	NS	NS	NS	< 0.002	NS	NS	**0.003**	NS
Mercury	0.002	0.0004	NS	< 0.0002	< 0.0002	NS	NS	NS	NS	< 0.0002	NS	NS	< 0.0002	NS
Nickel	0.1	0.88	NS	< 0.001	**0.003**	NS	NS	NS	NS	< 0.001	NS	NS	**0.002**	NS
Selenium	0.05	0.05	NS	< 0.01	< 0.01	NS	NS	NS	NS	< 0.010	NS	NS	< 0.010	NS
Silver	0.036	0.012	NS	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS	< 0.001	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.005	0.063	NS	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS	< 0.001	NS
Vanadium	0.05	NE	NS	**0.004**	**0.003**	NS	NS	NS	NS	< 0.002	NS	NS	< 0.002	NS
Zinc	5	0.123	NS	< 0.002	< 0.002	NS	NS	NS	NS	**0.009**	NS	NS	**0.008**	NS
PCB Homologs (ug/L)														
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0054 UJ	< 0.0053 UJ	< 0.0053 UJ	< 0.0050 UJ	< 0.0056 UJ	< 0.0050 UJ	< 0.0051 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ
Dichlorobiphenyl	NE	NE	< 0.0011 UJ	**0.0069 J**	**0.0075 J**	< 0.0010 UJ	< 0.0011 UJ	**0.015 J**	< 0.0010 UJ	**8.0 J**	**0.20 J**	< 0.0010 UJ	< 0.0010 UJ	< 0.0010 UJ
Heptachlorobiphenyl	NE	NE	< 0.0032 UJ	< 0.0032 UJ	< 0.0032 UJ	< 0.0030 UJ	< 0.0033 UJ	< 0.0030 UJ	< 0.0031 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0030 UJ
Hexachlorobiphenyl	NE	NE	< 0.0022 UJ	< 0.0021 UJ	< 0.0021 UJ	< 0.0020 UJ	< 0.0022 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ
Monochlorobiphenyl	NE	NE	< 0.0011 UJ	< 0.0011 UJ	< 0.0011 UJ	< 0.0010 UJ	< 0.0011 UJ	< 0.0010 UJ	< 0.0010 UJ	**8.9 J**	**0.048 J**	< 0.0010 UJ	< 0.0010 UJ	< 0.0010 UJ
Nonachlorobiphenyl	NE	NE	< 0.0054 UJ	< 0.0053 UJ	< 0.0053 UJ	< 0.0050 UJ	< 0.0056 UJ	< 0.0050 UJ	< 0.0051 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ
Octachlorobiphenyl	NE	NE	< 0.0032 UJ	< 0.0032 UJ	< 0.0032 UJ	< 0.0030 UJ	< 0.0033 UJ	< 0.0030 UJ	< 0.0031 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0030 UJ	< 0.0030 UJ
Pentachlorobiphenyl	NE	NE	< 0.0022 UJ	**0.0054 J**	**0.0089 J**	< 0.0020 UJ	**0.010 J**	< 0.0020 UJ	< 0.0020 UJ	**0.015 J**	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ
Tetrachlorobiphenyl	NE	NE	< 0.0022 UJ	**0.029 J**	**0.040 J**	< 0.0020 UJ	**0.040 J**	**0.037 J**	< 0.0020 UJ	**0.19 J**	**0.075 J**	< 0.0020 UJ	< 0.0020 UJ	< 0.0020 UJ
Trichlorobiphenyl	NE	NE	< 0.0011 UJ	**0.028 J**	**0.032 J**	< 0.0010 UJ	**0.015 J**	**0.045 J**	< 0.0010 UJ	**1.1 J**	**0.16 J**	< 0.0010 UJ	< 0.0010 UJ	< 0.0010 UJ
Total PCB Homologues	0.5	0.5	< 0.0054 UJ	**0.070 J**	**0.088 J**	< 0.0050 UJ	**0.065 J**	**0.097 J**	< 0.0051 UJ	**18 J**	**0.49 J**	< 0.0050 UJ	< 0.0050 UJ	< 0.0050 UJ

Notes:
This is a summary table. Only detected compounds are presented.
Bold = Detected above reporting limit
Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CT
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Actio

Table 3
Groundwater Analytical Results - November 2017

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-28 MW-28-111517-1 11/15/2017 17K0912	MW-35 MW-35-111617-1 11/16/2017 17K1027	MW-AA12D MW-AA12D-111417-1 11/14/2017 17K0813	MW-AA19 MW-AA19-111617-1 11/16/2017 17K1027	MW-AE8 MW-AE8-111417-1 11/14/2017 17K0813	MW-AG10 MW-AG10-111417-1 11/14/2017 17K0813	MW-AG30 MW-AG30-111617-1 11/16/2017 17K1027	MW-AH16R MW-AH16R-111517-1 11/15/2017 17K0912	MW-AJ13 MW-AJ13-111417-1 11/14/2017 17K0813	MW-AJ13D MW-AJ13D-111417-1 11/14/2017 17K0813	MW-AJ19 MW-AJ19-111617-1 11/16/2017 17K1027	MW-AL10 MW-AL10-111417-1 11/14/2017 17K0813
PAHs (ug/L)														
2-Methylnaphthalene	NE	NE	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	**0.12**	< 0.05	NS	NS	NS
Acenaphthene	NE	NE	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	**0.48**	< 0.05	NS	NS	NS
Acenaphthylene	420	0.3	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS	NS
Anthracene	2000	1100000	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	**0.06**	< 0.05	NS	NS	NS
Benzo(a)anthracene	0.06	0.3	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS	NS
Benzo(a)pyrene	0.2	0.3	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS	NS
Benzo(b)fluoranthene	0.08	0.3	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS	NS
Benzo(g,h,i)perylene	NE	NE	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS	NS
Benzo(k)fluoranthene	0.5	0.3	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS	NS
Chrysene	NE	NE	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS	NS
Dibenzo(a,h)anthracene	NE	NE	< 0.01	< 0.01	NS	NS	< 0.01	NS	NS	< 0.01	< 0.01	NS	NS	NS
Fluoranthene	280	3700	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS	NS
Fluorene	280	140000	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	**0.26**	< 0.05	NS	NS	NS
Indeno(1,2,3-cd)pyrene	NE	NE	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS	NS
Naphthalene	280	NE	< 0.10	< 0.09	NS	NS	< 0.09	NS	NS	**0.30**	< 0.10	NS	NS	NS
Phenanthrene	200	0.077	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	**0.07**	< 0.05	NS	NS	NS
Pyrene	200	110000	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS	NS
Metals (mg/L)														
Antimony	0.006	86	< 0.005	< 0.005	NS	NS	< 0.005	NS	NS	**0.015**	< 0.005	NS	NS	NS
Arsenic	0.05	0.004	< 0.004	< 0.004	NS	NS	< 0.004	NS	NS	**0.011**	**0.079**	NS	NS	NS
Barium	1	*2.2*	**0.072**	**0.575**	NS	NS	**0.137**	NS	NS	**0.719**	**0.054**	NS	NS	NS
Beryllium	0.004	0.004	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	< 0.001	< 0.001	NS	NS	NS
Cadmium	0.005	0.006	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	< 0.001	< 0.001	NS	NS	NS
Chromium	0.05	NE	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	**0.002**	**0.002**	NS	NS	NS
Copper	1.3	0.048	< 0.005	**0.017**	NS	NS	**0.044**	NS	NS	< 0.005	< 0.005	NS	NS	NS
Lead	0.015	0.013	< 0.002	**0.002**	NS	NS	< 0.002	NS	NS	**0.003**	< 0.002	NS	NS	NS
Mercury	0.002	0.0004	< 0.0002	< 0.0002	NS	NS	< 0.0002	NS	NS	< 0.0002	< 0.0002	NS	NS	NS
Nickel	0.1	0.88	< 0.001	**0.009**	NS	NS	**0.003**	NS	NS	**0.003**	**0.004**	NS	NS	NS
Selenium	0.05	0.05	< 0.010	< 0.010	NS	NS	< 0.010	NS	NS	< 0.010	< 0.010	NS	NS	NS
Silver	0.036	0.012	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	< 0.001	< 0.001	NS	NS	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.005	0.063	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	< 0.001	< 0.001	NS	NS	NS
Vanadium	0.05	NE	< 0.002	**0.002**	NS	NS	**0.003**	NS	NS	**0.002**	**0.004**	NS	NS	NS
Zinc	5	0.123	< 0.002	**0.004**	NS	NS	**0.006**	NS	NS	**0.019**	**3.71**	NS	NS	NS
PCB Homologs (ug/L)														
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0050	< 0.0048	< 0.0052	< 0.0046	< 0.0050	< 0.0050	< 0.0048	< 0.0050	< 0.0050	< 0.0050	< 0.0049	< 0.0050
Dichlorobiphenyl	NE	NE	< 0.0010	< 0.00096	**0.0087**	< 0.00092	< 0.0010	**0.10**	< 0.00096	**5.5**	**1.2**	**0.68**	< 0.00097	< 0.0010
Heptachlorobiphenyl	NE	NE	< 0.0030	< 0.0029	< 0.0031	< 0.0028	< 0.0030	< 0.0030	< 0.0029	< 0.0030	< 0.0030	< 0.0030	< 0.0029	< 0.0030
Hexachlorobiphenyl	NE	NE	**0.0040**	< 0.0019	< 0.0021	< 0.0018	< 0.0020	< 0.0020	< 0.0019	**0.0041**	< 0.0020	< 0.0020	< 0.0019	< 0.0020
Monochlorobiphenyl	NE	NE	< 0.0010	< 0.00096	**0.0013**	< 0.00092	< 0.0010	**0.010**	< 0.00096	**8.3**	**0.010**	**0.14**	< 0.00097	< 0.0010
Nonachlorobiphenyl	NE	NE	< 0.0050	< 0.0048	< 0.0052	< 0.0046	< 0.0050	< 0.0050	< 0.0048	< 0.0050	< 0.0050	< 0.0050	< 0.0049	< 0.0050
Octachlorobiphenyl	NE	NE	< 0.0030	< 0.0029	< 0.0031	< 0.0028	< 0.0030	< 0.0030	< 0.0029	< 0.0030	< 0.0030	< 0.0030	< 0.0029	< 0.0030
Pentachlorobiphenyl	NE	NE	**0.011**	< 0.0019	< 0.0021	< 0.0018	**0.053**	**0.010**	< 0.0019	**0.035**	**0.096**	**0.017**	< 0.0019	< 0.0020
Tetrachlorobiphenyl	NE	NE	**0.0068**	< 0.0019	**0.022**	< 0.0018	**0.11**	**0.072**	< 0.0019	**0.21**	**0.71**	**0.084**	< 0.0019	< 0.0020
Trichlorobiphenyl	NE	NE	< 0.0010	< 0.00096	**0.024**	< 0.00092	**0.024**	**0.071**	< 0.00096	**0.69**	**2.8**	**0.40**	< 0.00097	< 0.0010
Total PCB Homologues	0.5	0.5	**0.0218**	< 0.0048	**0.056**	< 0.0046	**0.187**	**0.263**	< 0.0048	**14.7391**	**4.816**	**1.321**	< 0.0049	< 0.0050

Notes:
This is a summary table. Only detected compounds are presented.
Bold = Detected above reporting limit
Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CTDEEP approval to implement. 0.25 mg/l is the proposed GWPC.
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Action Level set by the Connecticut Department of Public Health.

Table 3
Groundwater Analytical Results - November 2017

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-AM16 MW-AM16-111517-1 11/15/2017 17K0912	MW-AM16D MW-AM16D-111517-1 11/15/2017 17K0912	MW-AM21 MW-AM21-111617-1 11/16/2017 17K1027	MW-AP28 MW-AP28-111617-1 11/16/2017 17K1027	MW-AV17 MW-AV17-111517-1 11/15/2017 17K0912	MW-BB34 MW-BB34-111617-1 11/16/2017 17K1027	MW-F35 MW-F35-111617-1 11/16/2017 17K1027	MW-L25 MW-L25-111617-1 11/16/2017 17K1027	MW-P11 MW-P11-111517-1 11/15/2017 17K0912	MW-P7 MW-P7-111517-1 11/15/2017 17K0912	MW-R20 MW-R20-111617-1 11/16/2017 17K1027	MW-R20 MW-R20-111617-2 11/16/2017 17K1027
PAHs (ug/L)														
2-Methylnaphthalene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Acenaphthene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Acenaphthylene	420	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Anthracene	2000	1100000	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(a)anthracene	0.06	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(a)pyrene	0.2	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(b)fluoranthene	0.08	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(g,h,i)perylene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(k)fluoranthene	0.5	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Chrysene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Dibenzo(a,h)anthracene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.01	NS	NS
Fluoranthene	280	3700	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Fluorene	280	140000	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Indeno(1,2,3-cd)pyrene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Naphthalene	280	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.10	NS	NS
Phenanthrene	200	0.077	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Pyrene	200	110000	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Metals (mg/L)														
Antimony	0.006	86	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.005	NS	NS
Arsenic	0.05	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.004	NS	NS
Barium	1	*2.2*	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.138**	NS	NS
Beryllium	0.004	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS	NS
Cadmium	0.005	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS	NS
Chromium	0.05	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS	NS
Copper	1.3	0.048	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.005	NS	NS
Lead	0.015	0.013	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.002	NS	NS
Mercury	0.002	0.0004	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0002	NS	NS
Nickel	0.1	0.88	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.002**	NS	NS
Selenium	0.05	0.05	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.010	NS	NS
Silver	0.036	0.012	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS	NS
Vanadium	0.05	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.002	NS	NS
Zinc	5	0.123	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.012**	NS	NS
PCB Homologs (ug/L)														
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0048	< 0.0047	< 0.0047	< 0.0052	< 0.0050	< 0.0050	< 0.0050
Dichlorobiphenyl	NE	NE	**0.039**	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.00096	< 0.00095	< 0.00095	< 0.0010	**0.019**	< 0.0010	< 0.0010
Heptachlorobiphenyl	NE	NE	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0029	< 0.0028	< 0.0028	< 0.0031	< 0.0030	< 0.0030	< 0.0030
Hexachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0019	< 0.0019	< 0.0019	< 0.0021	< 0.0020	< 0.0020	< 0.0020
Monochlorobiphenyl	NE	NE	**0.010**	**0.0012**	< 0.0010	< 0.0010	< 0.0010	< 0.00096	< 0.00095	< 0.00095	**0.0020**	**0.030**	< 0.0010	< 0.0010
Nonachlorobiphenyl	NE	NE	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0048	< 0.0047	< 0.0047	< 0.0052	< 0.0050	< 0.0050	< 0.0050
Octachlorobiphenyl	NE	NE	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0029	< 0.0028	< 0.0028	< 0.0031	< 0.0030	< 0.0030	< 0.0030
Pentachlorobiphenyl	NE	NE	**0.035**	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0019	< 0.0019	< 0.0019	< 0.0021	< 0.0020	< 0.0020	< 0.0020
Tetrachlorobiphenyl	NE	NE	**0.15**	< 0.0020	**0.0043**	< 0.0020	< 0.0020	< 0.0019	< 0.0019	< 0.0019	< 0.0021	< 0.0020	< 0.0020	< 0.0020
Trichlorobiphenyl	NE	NE	**0.098**	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.00096	< 0.00095	< 0.00095	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total PCB Homologues	0.5	0.5	**0.332**	**0.0012**	**0.0043**	< 0.0050	< 0.0050	< 0.0048	< 0.0047	< 0.0047	**0.002**	**0.049**	< 0.0050	< 0.0050

Notes:
This is a summary table. Only detected compounds are presented.
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Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CT
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Actio

Table 3
Groundwater Analytical Results - November 2017

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-S15 MW-S15-111517-1 11/15/2017 17K0912	MW-S15 MW-S15-111517-2 11/15/2017 17K0912	MW-T23 MW-T23-111617-1 11/16/2017 17K1027	MW-V12 MW-V12-111517-1 11/15/2017 17K0912	MW-V18 MW-V18-111417-1 11/14/2017 17K0813	MW-X17 MW-X17-111417-1 11/14/2017 17K0813	MW-Y15 MW-Y15-111417-1 11/14/2017 17K0813	MW-Y15D MW-Y15D-111417-1 11/14/2017 17K0813	MW-Y26 MW-Y26-111617-1 11/16/2017 17K1027	MW-Y9 MW-Y9-111417-1 11/14/2017 17K0813	MW-Y9D MW-Y9D-111417-1 11/14/2017 17K0813
PAHs (ug/L)													
2-Methylnaphthalene	NE	NE	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Acenaphthene	NE	NE	< 0.05	< 0.05	NS	NS	NS	NS	**0.34**	NS	NS	< 0.05	NS
Acenaphthylene	420	0.3	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Anthracene	2000	1100000	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Benzo(a)anthracene	0.06	0.3	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Benzo(a)pyrene	0.2	0.3	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Benzo(b)fluoranthene	0.08	0.3	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Benzo(g,h,i)perylene	NE	NE	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Benzo(k)fluoranthene	0.5	0.3	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Chrysene	NE	NE	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Dibenzo(a,h)anthracene	NE	NE	< 0.01	< 0.01	NS	NS	NS	NS	< 0.01	NS	NS	< 0.01	NS
Fluoranthene	280	3700	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Fluorene	280	140000	< 0.05	< 0.05	NS	NS	NS	NS	**0.18**	NS	NS	< 0.05	NS
Indeno(1,2,3-cd)pyrene	NE	NE	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Naphthalene	280	NE	< 0.10	< 0.09	NS	NS	NS	NS	< 0.10	NS	NS	< 0.10	NS
Phenanthrene	200	0.077	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Pyrene	200	110000	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Metals (mg/L)													
Antimony	0.006	86	< 0.005	< 0.005	NS	NS	NS	NS	< 0.005	NS	NS	< 0.005	NS
Arsenic	0.05	0.004	< 0.004	< 0.004	NS	NS	NS	NS	< 0.004	NS	NS	**0.009**	NS
Barium	1	*2.2*	**0.077**	**0.098**	NS	NS	NS	NS	**0.486**	NS	NS	**0.789**	NS
Beryllium	0.004	0.004	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS	< 0.001	NS
Cadmium	0.005	0.006	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS	< 0.001	NS
Chromium	0.05	NE	**0.001**	**0.002**	NS	NS	NS	NS	**0.001**	NS	NS	< 0.001	NS
Copper	1.3	0.048	**0.008**	**0.008**	NS	NS	NS	NS	< 0.005	NS	NS	**0.010**	NS
Lead	0.015	0.013	< 0.002	**0.002**	NS	NS	NS	NS	< 0.002	NS	NS	**0.004**	NS
Mercury	0.002	0.0004	< 0.0002	< 0.0002	NS	NS	NS	NS	< 0.0002	NS	NS	< 0.0002	NS
Nickel	0.1	0.88	**0.001**	< 0.001	NS	NS	NS	NS	**0.002**	NS	NS	**0.005**	NS
Selenium	0.05	0.05	< 0.010	< 0.010	NS	NS	NS	NS	< 0.010	NS	NS	< 0.010	NS
Silver	0.036	0.012	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS	< 0.001	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.005	0.063	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS	< 0.001	NS
Vanadium	0.05	NE	**0.004**	**0.008**	NS	NS	NS	NS	< 0.002	NS	NS	< 0.002	NS
Zinc	5	0.123	**0.010**	**0.008**	NS	NS	NS	NS	**0.014**	NS	NS	**0.014**	NS
PCB Homologs (ug/L)													
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0052	< 0.0051	< 0.0050	< 0.0052	< 0.0046	< 0.0046	< 0.0050	< 0.0050	< 0.0048	< 0.0048	< 0.0048
Dichlorobiphenyl	NE	NE	**0.010**	**0.0075**	< 0.0010	< 0.0010	**0.015**	**0.081**	**4.8**	**0.13**	< 0.00095	< 0.00096	< 0.00096
Heptachlorobiphenyl	NE	NE	< 0.0031	< 0.0031	< 0.0030	< 0.0031	< 0.0028	< 0.0028	< 0.0030	< 0.0030	< 0.0029	< 0.0029	< 0.0029
Hexachlorobiphenyl	NE	NE	< 0.0021	< 0.0020	< 0.0020	**0.012**	< 0.0019	< 0.0019	< 0.0020	< 0.0020	< 0.0019	< 0.0019	< 0.0019
Monochlorobiphenyl	NE	NE	**0.0023**	< 0.0010	< 0.0010	< 0.0010	< 0.00093	< 0.00093	**4.1**	**0.023**	< 0.00095	< 0.00096	< 0.00096
Nonachlorobiphenyl	NE	NE	< 0.0052	< 0.0051	< 0.0050	< 0.0052	< 0.0046	< 0.0046	< 0.0050	< 0.0050	< 0.0048	< 0.0048	< 0.0048
Octachlorobiphenyl	NE	NE	< 0.0031	< 0.0031	< 0.0030	< 0.0031	< 0.0028	< 0.0028	< 0.0030	< 0.0030	< 0.0029	< 0.0029	< 0.0029
Pentachlorobiphenyl	NE	NE	**0.028**	**0.021**	< 0.0020	**0.13**	< 0.0019	< 0.0019	**0.031**	< 0.0020	< 0.0019	< 0.0019	< 0.0019
Tetrachlorobiphenyl	NE	NE	**0.093**	**0.078**	< 0.0020	**0.26**	**0.022**	**0.050**	**0.20**	**0.071**	< 0.0019	< 0.0019	< 0.0019
Trichlorobiphenyl	NE	NE	**0.057**	**0.043**	< 0.0010	**0.043**	**0.042**	**0.19**	**0.88**	**0.13**	< 0.00095	< 0.00096	< 0.00096
Total PCB Homologues	0.5	0.5	**0.1903**	**0.1495**	< 0.0050	**0.445**	**0.079**	**0.321**	**10.011**	**0.354**	< 0.0048	< 0.0048	< 0.0048

Notes:
This is a summary table. Only detected compounds are presented.
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Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CT
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Actio

Table 3
Groundwater Analytical Results - March 2018

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-28 MW-28-030618-1 3/6/2018 18C0227	MW-35 MW-35-030618-1 3/6/2018 18C0227	MW-AA12 MW-AA12-030818-1 3/8/2018 18C0412	MW-AA12D MW-AA12D-030618-1 3/6/2018 18C0227	MW-AA19 MW-AA19-030918-1 3/9/2018 18C0412	MW-AE8 MW-AE8-030818-1 3/8/2018 18C0412	MW-AG10 MW-AG10-030818-1 3/8/2018 18C0412	MW-AG30 MW-AG30-030918-1 3/9/2018 18C0412	MW-AH16R MW-AH16R-030618-1 3/6/2018 18C0227	MW-AJ13 MW-AJ13-030818-1 3/6/2018 18C0346	MW-AJ13D MW-AJ13D-030818-1 3/6/2018 18C0346	MW-AJ19 MW-AJ19-030918-1 3/9/2018 18C0412
PAHs (ug/L)														
2-Methylnaphthalene	NE	NE	< 0.05	< 0.05	**0.66**	NS	NS	< 0.05	NS	NS	**0.82**	< 0.05	NS	NS
Acenaphthene	NE	NE	< 0.05	< 0.05	**4.1**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Acenaphthylene	420	0.3	< 0.05	< 0.05	**0.07**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Anthracene	2000	1100000	< 0.05	< 0.05	**1.3**	NS	NS	< 0.05	NS	NS	**0.07**	< 0.05	NS	NS
Benzo(a)anthracene	0.06	0.3	< 0.05	< 0.05	**1.9**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Benzo(a)pyrene	0.2	0.3	< 0.05	< 0.05	**1.7**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Benzo(b)fluoranthene	0.08	0.3	< 0.05	< 0.05	**1.6**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Benzo(g,h,i)perylene	NE	NE	< 0.05	< 0.05	**1.1**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Benzo(k)fluoranthene	0.5	0.3	< 0.05	< 0.05	**1.4**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Chrysene	NE	NE	< 0.05	< 0.05	**1.7**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Dibenzo(a,h)anthracene	NE	NE	< 0.01	< 0.01	**0.44**	NS	NS	< 0.01	NS	NS	< 0.01	< 0.01	NS	NS
Fluoranthene	280	3700	< 0.05	< 0.05	**3.9**	NS	NS	< 0.05	NS	NS	< 0.05	**0.05**	NS	NS
Fluorene	280	140000	< 0.05	< 0.05	**2.5**	NS	NS	< 0.05	NS	NS	**0.17**	< 0.05	NS	NS
Indeno(1,2,3-cd)pyrene	NE	NE	< 0.05	< 0.05	**1.0**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Naphthalene	280	NE	< 0.10	< 0.10	**1.6**	NS	NS	< 0.10	NS	NS	**0.98**	< 0.10	NS	NS
Phenanthrene	200	0.077	< 0.05	< 0.05	**4.7**	NS	NS	< 0.05	NS	NS	**0.08**	**0.1**	NS	NS
Pyrene	200	110000	< 0.05	< 0.05	**3.4**	NS	NS	< 0.05	NS	NS	< 0.05	< 0.05	NS	NS
Metals (mg/L)														
Antimony	0.006	86	NS	NS	< 0.005	NS	NS	< 0.005	NS	NS	NS	NS	NS	NS
Arsenic	0.05	0.004	< 0.004	< 0.004	< 0.004	NS	NS	< 0.004	NS	NS	**0.002**	< 0.004	NS	NS
Barium	1	NE	**0.077**	**0.147**	**0.242**	NS	NS	**0.045**	NS	NS	**0.545**	**0.024**	NS	NS
Beryllium	0.004	0.004	NS	NS	< 0.001	NS	NS	< 0.001	NS	NS	NS	NS	NS	NS
Cadmium	0.005	0.006	< 0.001	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	< 0.001	< 0.001	NS	NS
Chromium	0.05	NE	**0.002**	**0.003**	< 0.001	NS	NS	< 0.001	NS	NS	**0.003**	< 0.001	NS	NS
Copper	1.3	0.048	NS	NS	< 0.005	NS	NS	**0.024**	NS	NS	NS	NS	NS	NS
Lead	0.015	0.013	< 0.002	**0.01**	< 0.002	NS	NS	< 0.002	NS	NS	< 0.002	**0.004**	NS	NS
Mercury	0.002	0.0004	< 0.0002	< 0.0002	< 0.0002	NS	NS	< 0.0002	NS	NS	< 0.0002	< 0.0002	NS	NS
Nickel	0.1	0.88	NS	NS	**0.001**	NS	NS	**0.001**	NS	NS	NS	NS	NS	NS
Selenium	0.05	0.05	< 0.010	< 0.010	< 0.010	NS	NS	< 0.010	NS	NS	< 0.010	< 0.010	NS	NS
Silver	0.036	0.012	< 0.001	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	< 0.001	< 0.001	NS	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.005	0.063	NS	NS	< 0.0005	NS	NS	< 0.0005	NS	NS	NS	NS	NS	NS
Vanadium	0.05	NE	NS	NS	< 0.002	NS	NS	**0.003**	NS	NS	NS	NS	NS	NS
Zinc	5	0.123	NS	NS	**0.275**	NS	NS	< 0.002	NS	NS	NS	NS	NS	NS
PCB Homologs (ug/L)														
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0051	< 0.0051	< 0.0054	< 0.0049	< 0.0049	< 0.0049	< 0.0049	< 0.0052	< 0.0049	< 0.0049	< 0.0049	< 0.0049
Dichlorobiphenyl	NE	NE	< 0.0010	< 0.0010	**1.1**	**0.013**	< 0.00097	< 0.00097	**0.037**	< 0.0010	**7.7**	**0.38**	**0.061**	< 0.00098
Heptachlorobiphenyl	NE	NE	< 0.0031	< 0.0031	< 0.0032	< 0.0029	< 0.0029	< 0.0029	< 0.0029	< 0.0031	< 0.0029	< 0.0029	< 0.0029	< 0.0029
Hexachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	**0.0069**	< 0.0020	< 0.0019	**0.0030**	< 0.0019	< 0.0021	**0.0044**	**0.011**	**0.013**	< 0.0020
Monochlorobiphenyl	NE	NE	< 0.0010	< 0.0010	**0.068**	**0.0019**	< 0.00097	< 0.00097	**0.0018**	< 0.0010	**4.7**	**0.0015**	**0.021**	< 0.00098
Nonachlorobiphenyl	NE	NE	< 0.0051	< 0.0051	< 0.0054	< 0.0049	< 0.0049	< 0.0049	< 0.0049	< 0.0052	< 0.0049	< 0.0049	< 0.0049	< 0.0049
Octachlorobiphenyl	NE	NE	< 0.0031	< 0.0031	< 0.0032	< 0.0029	< 0.0029	< 0.0029	< 0.0029	< 0.0031	< 0.0029	< 0.0029	< 0.0029	< 0.0029
Pentachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	**0.037**	**0.0070**	< 0.0019	**0.023**	**0.011**	< 0.0021	**0.032**	**0.13**	**0.053**	< 0.0020
Tetrachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	**0.25**	**0.045**	< 0.0019	**0.048**	**0.056**	< 0.0021	**0.19**	**0.56**	< 0.0020	< 0.0020
Trichlorobiphenyl	NE	NE	< 0.0010	< 0.0010	**0.67**	**0.044**	< 0.00097	**0.010**	**0.045**	< 0.0010	**0.79**	**1.7**	**0.073**	< 0.00098
Total PCB Homologues	0.5	0.5	< 0.0051	< 0.0051	**2.1319**	**0.1109**	< 0.0049	**0.084**	**0.1508**	< 0.0052	**13.4**	**2.7825**	**0.221**	< 0.0049

Notes:
This is a summary table. Only detected compounds are presented.
Bold = Detected above reporting limit
Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CTDEEP approval to implement. 0.25 mg/l is the proposed GWPC.
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Action Level set by the Connecticut Department of Public Health.

Table 3
Groundwater Analytical Results - March 2018

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-AL10 MW-AL10-030918-1 3/9/2018 18C0412	MW-AM16 MW-AM16-030918-1 3/9/2018 18C0412	MW-AM16D MW-AM16D-030918-1 3/9/2018 18C0412	MW-AM21 MW-AM21-030918-1 3/9/2018 18C0412	MW-AP11 MW-AP11-030918-1 3/9/2018 18C0412	MW-AV17 MW-AV17-030918-1 3/9/2018 18C0412	MW-BB34 MW-BB34-03052018-1 3/6/2018 18C0227	MW-F35 MW-F35-030818-1 3/6/2018 18C0346	MW-L25 MW-L25-030818-1 3/6/2018 18C0346	MW-P11 MW-P11-030618-1 3/6/2018 18C0227	MW-P7 MW-P7-030618-1 3/6/2018 18C0227	MW-R20 MW-R20-030818-1 3/6/2018 18C0346
PAHs (ug/L)														
2-Methylnaphthalene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Acenaphthene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Acenaphthylene	420	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Anthracene	2000	1100000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Benzo(a)anthracene	0.06	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Benzo(a)pyrene	0.2	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Benzo(b)fluoranthene	0.08	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Benzo(g,h,i)perylene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Benzo(k)fluoranthene	0.5	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Chrysene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Dibenzo(a,h)anthracene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.01	NS
Fluoranthene	280	3700	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Fluorene	280	140000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Indeno(1,2,3-cd)pyrene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Naphthalene	280	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.10	NS
Phenanthrene	200	0.077	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Pyrene	200	110000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS
Metals (mg/L)														
Antimony	0.006	86	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	0.05	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.004	NS
Barium	1	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.081**	NS
Beryllium	0.004	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium	0.005	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS
Chromium	0.05	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS
Copper	1.3	0.048	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	0.015	0.013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.002	NS
Mercury	0.002	0.0004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0002	NS
Nickel	0.1	0.88	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Selenium	0.05	0.05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.010	NS
Silver	0.036	0.012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Vanadium	0.05	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Zinc	5	0.123	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PCB Homologs (ug/L)														
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0049	< 0.0049	< 0.0048	< 0.0049	< 0.0053	< 0.0049	< 0.0052	< 0.0050	< 0.0051	< 0.0049	< 0.0049	< 0.0049
Dichlorobiphenyl	NE	NE	< 0.00098	**0.059**	< 0.00095	< 0.00098	**0.0017**	< 0.00097	< 0.0010	< 0.0010	< 0.0010	< 0.00098	< 0.00098	< 0.00098
Heptachlorobiphenyl	NE	NE	< 0.0029	< 0.0029	< 0.0029	< 0.0029	< 0.0032	< 0.0029	< 0.0031	< 0.0030	< 0.0030	< 0.0029	< 0.0029	< 0.0029
Hexachlorobiphenyl	NE	NE	< 0.0020	**0.0030**	< 0.0019	< 0.0020	< 0.0021	< 0.0019	< 0.0021	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Monochlorobiphenyl	NE	NE	< 0.00098	**0.0071**	< 0.00095	< 0.00098	< 0.0011	< 0.00097	< 0.0010	< 0.0010	< 0.0010	< 0.00098	< 0.00098	< 0.00098
Nonachlorobiphenyl	NE	NE	< 0.0049	< 0.0049	< 0.0048	< 0.0049	< 0.0053	< 0.0049	< 0.0052	< 0.0050	< 0.0051	< 0.0049	< 0.0049	< 0.0049
Octachlorobiphenyl	NE	NE	< 0.0029	< 0.0029	< 0.0029	< 0.0029	< 0.0032	< 0.0029	< 0.0031	< 0.0030	< 0.0030	< 0.0029	< 0.0029	< 0.0029
Pentachlorobiphenyl	NE	NE	< 0.0020	**0.039**	**0.011**	**0.0060**	< 0.0021	< 0.0019	< 0.0021	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Tetrachlorobiphenyl	NE	NE	< 0.0020	**0.18**	**0.035**	**0.015**	< 0.0021	< 0.0019	< 0.0021	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Trichlorobiphenyl	NE	NE	< 0.00098	**0.17**	**0.017**	**0.0011**	**0.0013**	< 0.00097	**0.0012**	< 0.0010	< 0.0010	< 0.00098	< 0.00098	**0.0010**
Total PCB Homologues	0.5	0.5	< 0.0049	**0.4581**	**0.063**	**0.0221**	**0.003**	< 0.0049	**0.0012**	< 0.0050	< 0.0051	< 0.0049	< 0.0049	**0.001**

Notes:
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Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CT
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Actio

Table 3
Groundwater Analytical Results - March 2018

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-R20 DUP MW-R20-030818-2 3/6/2018 18C0346	MW-S15 MW-S15-030618-1 3/6/2018 18C0227	MW-S15 MW-S15-030618-2 3/6/2018 18C0227	MW-T23 MW-T23-030818-1 3/6/2018 18C0346	MW-V12 MW-V12-030618-1 3/6/2018 18C0227	MW-V18 MW-V18-030818-1 3/6/2018 18C0346	MW-X17 MW-X17-030818-1 3/6/2018 18C0346	MW-Y15 MW-Y15-030618-1 3/6/2018 18C0227	MW-Y15D MW-Y15D-030618-1 3/6/2018 18C0227	MW-Y26 MW-Y26-030818-1 3/6/2018 18C0346	MW-Y9 MW-Y9-030618-1 3/6/2018 18C0346	MW-Y9D MW-Y9D-030618-1 3/6/2018 18C0346
PAHs (ug/L)														
2-Methylnaphthalene	NE	NE	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	**0.08**	NS
Acenaphthene	NE	NE	NS	< 0.05	< 0.05	NS	NS	NS	NS	**0.25**	NS	NS	< 0.05	NS
Acenaphthylene	420	0.3	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Anthracene	2000	1100000	NS	< 0.05	< 0.05	NS	NS	NS	NS	**0.06**	NS	NS	< 0.05	NS
Benzo(a)anthracene	0.06	0.3	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Benzo(a)pyrene	0.2	0.3	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Benzo(b)fluoranthene	0.08	0.3	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Benzo(g,h,i)perylene	NE	NE	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Benzo(k)fluoranthene	0.5	0.3	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Chrysene	NE	NE	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Dibenzo(a,h)anthracene	NE	NE	NS	< 0.01	< 0.01	NS	NS	NS	NS	< 0.01	NS	NS	< 0.01	NS
Fluoranthene	280	3700	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Fluorene	280	140000	NS	< 0.05	< 0.05	NS	NS	NS	NS	**0.14**	NS	NS	< 0.05	NS
Indeno(1,2,3-cd)pyrene	NE	NE	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Naphthalene	280	NE	NS	< 0.10	< 0.10	NS	NS	NS	NS	< 0.10	NS	NS	< 0.10	NS
Phenanthrene	200	0.077	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Pyrene	200	110000	NS	< 0.05	< 0.05	NS	NS	NS	NS	< 0.05	NS	NS	< 0.05	NS
Metals (mg/L)														
Antimony	0.006	86	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	0.05	0.004	NS	**0.005**	**0.005**	NS	NS	NS	NS	< 0.004	NS	NS	**0.004**	NS
Barium	1	NE	NS	**0.092**	**0.092**	NS	NS	NS	NS	**0.479**	NS	NS	**0.077**	NS
Beryllium	0.004	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium	0.005	0.006	NS	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS	**0.001**	NS
Chromium	0.05	NE	NS	**0.002**	**0.002**	NS	NS	NS	NS	**0.002**	NS	NS	**0.002**	NS
Copper	1.3	0.048	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	0.015	0.013	NS	**0.001**	< 0.002	NS	NS	NS	NS	**0.007**	NS	NS	**0.002**	NS
Mercury	0.002	0.0004	NS	< 0.0002	< 0.0002	NS	NS	NS	NS	< 0.0002	NS	NS	**0.0002**	NS
Nickel	0.1	0.88	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Selenium	0.05	0.05	NS	< 0.010	< 0.010	NS	NS	NS	NS	< 0.010	NS	NS	**0.010**	NS
Silver	0.036	0.012	NS	< 0.001	< 0.001	NS	NS	NS	NS	< 0.001	NS	NS	**0.001**	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Vanadium	0.05	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Zinc	5	0.123	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PCB Homologs (ug/L)														
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0049	< 0.0051	< 0.0052	< 0.0050	< 0.0048	< 0.0052	< 0.0050	< 0.0049	< 0.0051	< 0.0050	< 0.0049	< 0.0049
Dichlorobiphenyl	NE	NE	< 0.00098	**0.0019**	**0.0042**	< 0.0010	< 0.00096	**0.0025**	< 0.0010	**2.8**	**0.061**	< 0.00099	< 0.00098	< 0.00097
Heptachlorobiphenyl	NE	NE	< 0.0029	< 0.0031	< 0.0031	< 0.0030	< 0.0029	< 0.0031	< 0.0030	< 0.0029	< 0.0031	< 0.0030	< 0.0029	< 0.0029
Hexachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	< 0.0021	< 0.0020	**0.0031**	< 0.0021	< 0.0020	**0.0024**	< 0.0020	< 0.0020	< 0.0020	< 0.0019
Monochlorobiphenyl	NE	NE	< 0.00098	< 0.0010	**0.0012**	< 0.0010	< 0.00096	< 0.0010	< 0.0010	**2.6**	**0.014**	< 0.00099	< 0.00098	< 0.00097
Nonachlorobiphenyl	NE	NE	< 0.0049	< 0.0051	< 0.0052	< 0.0050	< 0.0048	< 0.0052	< 0.0050	< 0.0049	< 0.0051	< 0.0050	< 0.0049	< 0.0049
Octachlorobiphenyl	NE	NE	< 0.0029	< 0.0031	< 0.0031	< 0.0030	< 0.0029	< 0.0031	< 0.0030	< 0.0029	< 0.0031	< 0.0030	< 0.0029	< 0.0029
Pentachlorobiphenyl	NE	NE	< 0.0020	**0.0076**	**0.0059**	< 0.0020	**0.048**	**0.0068**	< 0.0020	**0.025**	**0.018**	< 0.0020	**0.0033**	< 0.0019
Tetrachlorobiphenyl	NE	NE	< 0.0020	**0.026**	**0.025**	< 0.0020	**0.11**	**0.031**	**0.0023**	**0.14**	**0.057**	< 0.0020	**0.0031**	< 0.0019
Trichlorobiphenyl	NE	NE	< 0.00098	**0.016**	**0.017**	< 0.0010	**0.017**	**0.015**	**0.0022**	**0.50**	**0.063**	< 0.00099	**0.0013**	< 0.00097
Total PCB Homologues	0.5	0.5	< 0.0049	**0.052**	**0.0533**	< 0.0050	**0.1781**	**0.0553**	**0.0045**	**6.067**	**0.213**	< 0.0050	**0.0077**	< 0.0049

Notes:
This is a summary table. Only detected compounds are presented.
Bold = Detected above reporting limit
Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CT
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Actio

Table 3
Groundwater Analytical Results - June 2018

Location ID Sample ID Sample Date Task SDG	GWPC	SWPC	MW-28 MW-28-062918-1 6/29/2018 GW-2018-June 18G0022	MW-35 MW-35-062918-1 6/29/2018 GW-2018-June 18G0022	MW-AA12 MW-AA12-062718-1 6/27/2018 GW-2018-June 18F1460	MW-AA12D MW-AA12D-062618-1 6/26/2018 GW-2018-June 18F1321	MW-AA19 MW-AA19-062918-1 6/29/2018 GW-2018-June 18G0022	MW-AE8 MW-AE8-062718-1 6/27/2018 GW-2018-June 18F1384	MW-AG10 MW-AG10-062718-1 6/27/2018 GW-2018-June 18F1383	MW-AG30 MW-AG30-062718-1 6/27/2018 GW-2018-June 18F1384	MW-AH16R MW-AH16R-062818-1 6/28/2018 GW-2018-June 18F1460	MW-AJ13 MW-AJB-062718-1 6/27/2018 GW-2018-June 18F1384	MW-AJ13D MW-AJBD-067218-1 6/27/2018 GW-2018-June 18F1384	MW-AJ19 MW-AJ19-062718-1 6/27/2018 GW-2018-June 18F1384
PAHs (ug/L)														
2-Methylnaphthalene	NE	NE	< 0.05	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	**0.16**	<0.05	NS	NS
Acenaphthene	NE	NE	< 0.05	< 0.05	**0.62**	NS	NS	< 0.05	NS	NS	**0.55**	<0.05	NS	NS
Acenaphthylene	420	0.3	< 0.05	< 0.05	**0.05**	NS	NS	< 0.05	NS	NS	<0.05	<0.05	NS	NS
Anthracene	2000	1100000	< 0.05	< 0.05	**0.07**	NS	NS	< 0.05	NS	NS	**0.09**	<0.05	NS	NS
Benzo(a)anthracene	0.06	0.3	< 0.05	< 0.05	**0.05**	NS	NS	< 0.05	NS	NS	<0.05	<0.05	NS	NS
Benzo(a)pyrene	0.2	0.3	< 0.05	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	<0.05	<0.05	NS	NS
Benzo(b)fluoranthene	0.08	0.3	< 0.05	< 0.05	**0.05**	NS	NS	< 0.05	NS	NS	<0.05	<0.05	NS	NS
Benzo(g,h,i)perylene	NE	NE	< 0.05	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	<0.05	<0.05	NS	NS
Benzo(k)fluoranthene	0.5	0.3	< 0.05	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	<0.05	<0.05	NS	NS
Chrysene	NE	NE	< 0.05	< 0.05	**0.06**	NS	NS	< 0.05	NS	NS	<0.05	<0.05	NS	NS
Dibenzo(a,h)anthracene	NE	NE	< 0.01	< 0.01	< 0.01	NS	NS	< 0.01	NS	NS	<0.01	<0.01	NS	NS
Fluoranthene	280	3700	< 0.05	< 0.05	**0.18**	NS	NS	< 0.05	NS	NS	**0.08**	<0.05	NS	NS
Fluorene	280	140000	< 0.05	< 0.05	**0.34**	NS	NS	< 0.05	NS	NS	**0.34**	<0.05	NS	NS
Indeno(1,2,3-cd)pyrene	NE	NE	< 0.05	< 0.05	< 0.05	NS	NS	< 0.05	NS	NS	<0.05	<0.05	NS	NS
Naphthalene	280	NE	< 0.10	< 0.10	**0.18**	NS	NS	< 0.10	NS	NS	**0.37**	<0.10	NS	NS
Phenanthrene	200	0.077	< 0.05	< 0.05	**0.07**	NS	NS	< 0.05	NS	NS	<0.05	<0.05	NS	NS
Pyrene	200	110000	< 0.05	< 0.05	**0.10**	NS	NS	< 0.05	NS	NS	**0.06**	<0.05	NS	NS
Metals (mg/L)														
Antimony	0.006	86	< 0.005	< 0.005	< 0.005	NS	NS	< 0.005	NS	NS	<0.005	<0.005	NS	NS
Arsenic	0.05	0.004	< 0.004	< 0.004	< 0.004	NS	NS	< 0.004	NS	NS	**0.006**	**0.02**	NS	NS
Barium	1	NE	**0.064**	**0.568**	**0.780**	NS	NS	**0.140**	NS	NS	**0.988**	**0.058**	NS	NS
Beryllium	0.004	0.004	< 0.001	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	<0.001	<0.001	NS	NS
Cadmium	0.005	0.006	< 0.001	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	<0.001	<0.001	NS	NS
Chromium	0.05	NE	< 0.001	< 0.001	< 0.001	NS	NS	**0.001**	NS	NS	**0.004**	**0.001**	NS	NS
Copper	1.3	0.048	< 0.005	< 0.005	< 0.005	NS	NS	**0.006**	NS	NS	<0.005	<0.005	NS	NS
Lead	0.015	0.013	< 0.002	< 0.002	< 0.002	NS	NS	< 0.002	NS	NS	<0.002	<0.002	NS	NS
Mercury	0.002	0.0004	< 0.0002	< 0.0002	< 0.0002	NS	NS	< 0.0002	NS	NS	<0.0002	<0.0002	NS	NS
Nickel	0.1	0.88	< 0.001	**0.006**	**0.002**	NS	NS	**0.003**	NS	NS	**0.002**	**0.006**	NS	NS
Selenium	0.05	0.05	< 0.010	< 0.010	< 0.010	NS	NS	< 0.010	NS	NS	<0.010	<0.010	NS	NS
Silver	0.036	0.012	< 0.001	< 0.001	< 0.001	NS	NS	< 0.001	NS	NS	<0.001	<0.001	NS	NS
Thallium	0.005	0.063	< 0.001	< 0.001	< 0.0005	NS	NS	< 0.0005	NS	NS	<0.0005	<0.0005	NS	NS
Vanadium	0.05	NE	< 0.002	< 0.002	< 0.002	NS	NS	**0.003**	NS	NS	**0.005**	**0.005**	NS	NS
Zinc	5	0.123	**0.003**	< 0.002	**0.206**	NS	NS	**0.004**	NS	NS	**0.029**	**1.66**	NS	NS
PCB Homologs (ug/L)														
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0051	< 0.0051	< 0.0051	< 0.0050	< 0.0050	< 0.0050	< 0.0049	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0049
Dichlorobiphenyl	NE	NE	< 0.0010	< 0.0010	**0.96**	**0.0080**	< 0.0010	< 0.0010	**0.048**	< 0.0010	**6.9**	**0.41**	**0.42**	< 0.00098
Heptachlorobiphenyl	NE	NE	< 0.0030	< 0.0031	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0029	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0029
Hexachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	**0.0055**	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	**0.0050**	< 0.0020	< 0.0020	< 0.0020
Monochlorobiphenyl	NE	NE	< 0.0010	< 0.0010	**0.046**	< 0.0010	< 0.0010	< 0.0010	**0.0061**	< 0.0010	**5.6**	< 0.0010	**0.076**	< 0.00098
Nonachlorobiphenyl	NE	NE	< 0.0051	< 0.0051	< 0.0051	< 0.0050	< 0.0050	< 0.0050	< 0.0049	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0049
Octachlorobiphenyl	NE	NE	< 0.0030	< 0.0031	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0029	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0029
Pentachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	**0.054**	< 0.0020	< 0.0020	**0.0083**	**0.0040**	< 0.0020	**0.033**	**0.052**	**0.0064**	< 0.0020
Tetrachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	**0.26**	**0.015**	< 0.0020	**0.025**	**0.027**	< 0.0020	**0.30**	**0.41**	**0.038**	**0.0026**
Trichlorobiphenyl	NE	NE	< 0.0010	< 0.0010	**0.63**	**0.012**	< 0.0010	**0.0039**	**0.030**	< 0.0010	**1.5**	**1.7**	**0.24**	< 0.00098
Total PCB Homologues	0.5	0.5	< 0.0051	< 0.0051	**1.9555**	**0.035**	< 0.0050	**0.0372**	**0.1151**	< 0.0050	**14.338**	**2.572**	**0.7804**	**0.0026**

Notes:
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NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CTDEEP approval to implement. 0.25 mg/l is the proposed GWPC.
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Action Level set by the Connecticut Department of Public Health.

Table 3
Groundwater Analytical Results - June 2018

Location ID Sample ID Sample Date Task SDG	GWPC	SWPC	MW-AL10 MW-AL10-062718-1 6/27/2018 GW-2018-June 18F1384	MW-AM16 MW-AM16-062818-1 6/28/2018 GW-2018-June 18F1460	MW-AM16D MW-AM16D-062718-1 6/27/2018 GW-2018-June 18F1384	MW-AM21 MW-AM21-062718-1 6/27/2018 GW-2018-June 18F1383	MW-AP28 MW-AP28-062718-1 6/27/2018 GW-2018-June 18F1384	MW-AV17 MW-AV17-062718-1 6/27/2018 GW-2018-June 18F1384	MW-F35 MW-F35-062918-1 6/29/2018 GW-2018-June 18G0022	MW-L25 MW-L25-062818-1 6/28/2018 GW-2018-June 18F1460	MW-P11 MW-P11-062818-1 6/28/2018 GW-2018-June 18F1460	MW-P7 MW-P7-062818-1 6/28/2018 GW-2018-June 18F1460	MW-R20 MW-R20-062818-1 6/28/2018 GW-2018-June 18F1461	MW-R20 MW-R20-062818-2 6/28/2018 GW-2018-June 18F1461
PAHs (ug/L)														
2-Methylnaphthalene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Acenaphthene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Acenaphthylene	420	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Anthracene	2000	1100000	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(a)anthracene	0.06	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(a)pyrene	0.2	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(b)fluoranthene	0.08	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(g,h,i)perylene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Benzo(k)fluoranthene	0.5	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Chrysene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Dibenzo(a,h)anthracene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.01	NS	NS
Fluoranthene	280	3700	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Fluorene	280	140000	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Indeno(1,2,3-cd)pyrene	NE	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Naphthalene	280	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.10	NS	NS
Phenanthrene	200	0.077	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Pyrene	200	110000	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.05	NS	NS
Metals (mg/L)														
Antimony	0.006	86	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.005	NS	NS
Arsenic	0.05	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.004	NS	NS
Barium	1	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.143**	NS	NS
Beryllium	0.004	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS	NS
Cadmium	0.005	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS	NS
Chromium	0.05	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS	NS
Copper	1.3	0.048	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.005	NS	NS
Lead	0.015	0.013	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.002	NS	NS
Mercury	0.002	0.0004	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0002	NS	NS
Nickel	0.1	0.88	NS	NS	NS	NS	NS	NS	NS	NS	NS	**0.001**	NS	NS
Selenium	0.05	0.05	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.010	NS	NS
Silver	0.036	0.012	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.001	NS	NS
Thallium	0.005	0.063	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.0005	NS	NS
Vanadium	0.05	NE	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.002	NS	NS
Zinc	5	0.123	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 0.002	NS	NS
PCB Homologs (ug/L)														
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0049	< 0.0050	< 0.0051	< 0.0050	< 0.0052	< 0.0051	< 0.0051	< 0.0051
Dichlorobiphenyl	NE	NE	< 0.0010	**0.017**	**0.0011**	**0.0015**	**0.0029**	< 0.0010	< 0.0010	< 0.0010	**0.0030**	**0.0027**	< 0.0010	< 0.0010
Heptachlorobiphenyl	NE	NE	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0029	< 0.0030	< 0.0030	< 0.0030	< 0.0031	< 0.0031	< 0.0031	< 0.0031
Hexachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0021	< 0.0020	< 0.0020	< 0.0020
Monochlorobiphenyl	NE	NE	< 0.0010	**0.0068**	< 0.0010	< 0.0010	**0.0029**	< 0.0010	< 0.0010	< 0.0010	**0.0013**	**0.0013**	< 0.0010	< 0.0010
Nonachlorobiphenyl	NE	NE	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0049	< 0.0050	< 0.0051	< 0.0050	< 0.0052	< 0.0051	< 0.0051	< 0.0051
Octachlorobiphenyl	NE	NE	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0029	< 0.0030	< 0.0030	< 0.0030	< 0.0031	< 0.0031	< 0.0031	< 0.0031
Pentachlorobiphenyl	NE	NE	< 0.0020	**0.0073**	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0021	< 0.0020	< 0.0020	< 0.0020
Tetrachlorobiphenyl	NE	NE	< 0.0020	**0.047**	**0.0021**	**0.0038**	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0021	< 0.0020	< 0.0020	< 0.0020
Trichlorobiphenyl	NE	NE	< 0.0010	**0.027**	< 0.0010	**0.0010**	< 0.00098	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total PCB Homologues	0.5	0.5	< 0.0050	**0.1051**	**0.0032**	**0.0063**	**0.0058**	< 0.0050	< 0.0051	< 0.0050	**0.0043**	**0.004**	< 0.0051	< 0.0051

Notes:
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Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CT
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Actio

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Groundwater Analytical Results - June 2018

Location ID Sample ID Sample Date Task SDG	GWPC	SWPC	MW-S15 MW-S15-062818-1 6/28/2018 GW-2018-June 18F1460	MW-S15 MW-S15-062818-2 6/28/2018 GW-2018-June 18F1460	MW-T23 MW-T23-062818-1 6/28/2018 GW-2018-June 18F1460	MW-V18 MW-V18-062818-1 6/28/2018 GW-2018-June 18F1460	MW-X17 MW-X17-062618-1 6/26/2018 GW-2018-June 18F1321	MW-Y15 MW-Y15-062618-1 6/26/2018 GW-2018-June 18F1321	MW-Y15D MW-Y15D-062618-1 6/26/2018 GW-2018-June 18F1321	MW-Y26 MW-Y26-062918-1 6/29/2018 GW-2018-June 18G0022	MW-Y9 MW-Y9-062618-1 6/26/2018 GW-2018-June 18F1321	MW-Y9D MW-Y9D-062618-1 6/26/2018 GW-2018-June 18F1321
PAHs (ug/L)												
2-Methylnaphthalene	NE	NE	< 0.05	< 0.05	NS	NS	NS	**0.13**	NS	NS	<0.05	NS
Acenaphthene	NE	NE	< 0.05	< 0.05	NS	NS	NS	**0.51**	NS	NS	<0.05	NS
Acenaphthylene	420	0.3	< 0.05	< 0.05	NS	NS	NS	<0.05	NS	NS	<0.05	NS
Anthracene	2000	1100000	< 0.05	< 0.05	NS	NS	NS	**0.09**	NS	NS	<0.05	NS
Benzo(a)anthracene	0.06	0.3	< 0.05	< 0.05	NS	NS	NS	<0.05	NS	NS	<0.05	NS
Benzo(a)pyrene	0.2	0.3	< 0.05	< 0.05	NS	NS	NS	<0.05	NS	NS	<0.05	NS
Benzo(b)fluoranthene	0.08	0.3	< 0.05	< 0.05	NS	NS	NS	<0.05	NS	NS	<0.05	NS
Benzo(g,h,i)perylene	NE	NE	< 0.05	< 0.05	NS	NS	NS	<0.05	NS	NS	<0.05	NS
Benzo(k)fluoranthene	0.5	0.3	< 0.05	< 0.05	NS	NS	NS	<0.05	NS	NS	<0.05	NS
Chrysene	NE	NE	< 0.05	< 0.05	NS	NS	NS	<0.05	NS	NS	<0.05	NS
Dibenzo(a,h)anthracene	NE	NE	< 0.01	< 0.01	NS	NS	NS	<0.01	NS	NS	<0.01	NS
Fluoranthene	280	3700	< 0.05	< 0.05	NS	NS	NS	<0.05	NS	NS	<0.05	NS
Fluorene	280	140000	< 0.05	< 0.05	NS	NS	NS	**0.27**	NS	NS	<0.05	NS
Indeno(1,2,3-cd)pyrene	NE	NE	< 0.05	< 0.05	NS	NS	NS	<0.05	NS	NS	<0.05	NS
Naphthalene	280	NE	< 0.10	< 0.10	NS	NS	NS	<0.09	NS	NS	<0.10	NS
Phenanthrene	200	0.077	< 0.05	< 0.05	NS	NS	NS	**0.1**	NS	NS	<0.05	NS
Pyrene	200	110000	< 0.05	< 0.05	NS	NS	NS	<0.05	NS	NS	<0.05	NS
Metals (mg/L)												
Antimony	0.006	86	< 0.005	< 0.005	NS	NS	NS	<0.005	NS	NS	<0.005	NS
Arsenic	0.05	0.004	< 0.004	< 0.004	NS	NS	NS	<0.004	NS	NS	**0.005**	NS
Barium	1	NE	**0.122**	**0.123**	NS	NS	NS	**0.7**	NS	NS	**0.886**	NS
Beryllium	0.004	0.004	< 0.001	< 0.001	NS	NS	NS	<0.001	NS	NS	<0.001	NS
Cadmium	0.005	0.006	< 0.001	< 0.001	NS	NS	NS	<0.001	NS	NS	<0.001	NS
Chromium	0.05	NE	**0.001**	**0.001**	NS	NS	NS	<0.001	NS	NS	<0.001	NS
Copper	1.3	0.048	< 0.005	< 0.005	NS	NS	NS	<0.005	NS	NS	<0.005	NS
Lead	0.015	0.013	< 0.002	< 0.002	NS	NS	NS	<0.002	NS	NS	<0.002	NS
Mercury	0.002	0.0004	< 0.0002	< 0.0002	NS	NS	NS	<0.0002	NS	NS	<0.0002	NS
Nickel	0.1	0.88	< 0.001	< 0.001	NS	NS	NS	**0.001**	NS	NS	**0.003**	NS
Selenium	0.05	0.05	< 0.010	< 0.010	NS	NS	NS	<0.010	NS	NS	<0.010	NS
Silver	0.036	0.012	< 0.001	< 0.001	NS	NS	NS	<0.001	NS	NS	<0.001	NS
Thallium	0.005	0.063	< 0.0005	< 0.0005	NS	NS	NS	<0.0005	NS	NS	<0.0005	NS
Vanadium	0.05	NE	**0.003**	**0.003**	NS	NS	NS	<0.002	NS	NS	<0.002	NS
Zinc	5	0.123	< 0.002	< 0.002	NS	NS	NS	**0.007**	NS	NS	**0.005**	NS
PCB Homologs (ug/L)												
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0051	< 0.0051	< 0.0052	< 0.0051	< 0.0050	< 0.0050	< 0.0050	< 0.0051	< 0.0050	< 0.0050
Dichlorobiphenyl	NE	NE	**0.0049**	**0.0088**	< 0.0010	**0.0073**	**0.0056**	**7.2**	**0.068**	< 0.0010	< 0.0010	< 0.0010
Heptachlorobiphenyl	NE	NE	< 0.0031	< 0.0031	< 0.0031	< 0.0031	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030
Hexachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	< 0.0021	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Monochlorobiphenyl	NE	NE	< 0.0010	**0.0042**	**0.0013**	**0.0024**	**0.0033**	**8.0**	**0.020**	< 0.0010	< 0.0010	< 0.0010
Nonachlorobiphenyl	NE	NE	< 0.0051	< 0.0051	< 0.0052	< 0.0051	< 0.0050	< 0.0050	< 0.0050	< 0.0051	< 0.0050	< 0.0050
Octachlorobiphenyl	NE	NE	< 0.0031	< 0.0031	< 0.0031	< 0.0031	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0030
Pentachlorobiphenyl	NE	NE	< 0.0020	**0.0032**	< 0.0021	< 0.0020	< 0.0020	**0.012**	**0.0051**	< 0.0020	< 0.0020	< 0.0020
Tetrachlorobiphenyl	NE	NE	**0.015**	**0.015**	< 0.0021	**0.0090**	**0.0022**	**0.15**	**0.041**	< 0.0020	< 0.0020	< 0.0020
Trichlorobiphenyl	NE	NE	**0.013**	**0.014**	< 0.0010	**0.016**	**0.0021**	**1.1**	**0.061**	< 0.0010	< 0.0010	< 0.0010
Total PCB Homologues	0.5	0.5	**0.0329**	**0.0452**	**0.0013**	**0.0347**	**0.0132**	**16.462**	**0.1951**	< 0.0051	< 0.0050	< 0.0050

Notes:
This is a summary table. Only detected compounds are presented.
Bold = Detected above reporting limit
Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CT
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Actio

Table 3
Groundwater Analytical Results - September 2018

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-28 MW-28-092818-1 9/28/2018 18I1338	MW-35 MW-35-092818-1 9/28/2018 18I1338	MW-AA12D MW-AA12D-092618-1 9/26/2018 18I1195	MW-AA19 MW-AA19-092518-1 9/25/2018 18I1109	MW-AE8 MW-AE8-092618-1 9/26/2018 18I1195	MW-AG10 MW-AG10-092718-1 9/27/2018 18I1258	MW-AG30 MW-AG30-092718-1 9/27/2018 18I1258	MW-AH16D MW-AH16D-092718-1 9/27/2018 18I1258	MW-AH16R MW-AH16R-092718-1 9/27/2018 18I1258	MW-AJ13 MW-AJ13-092718-1 9/27/2018 18I1258	MW-AJ13D MW-AJ13D-092718-1 9/27/2018 18I1258	MW-AJ19 MW-AJ19-092718-1 9/27/2018 18I1338	MW-AL10 MW-AL10-092618-1 9/26/2018 18I1195
PAHs (ug/L)															
2-Methylnaphthalene	NE	NE	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	**0.22**	< 0.05	NA	NA	NA
Acenaphthene	NE	NE	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	**0.46**	< 0.05	NA	NA	NA
Acenaphthylene	420	0.3	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA
Anthracene	2000	1.1e+006	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	**0.05**	< 0.05	NA	NA	NA
Benzo(a)anthracene	0.06	0.3	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA
Benzo(a)pyrene	0.2	0.3	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA
Benzo(b)fluoranthene	0.08	0.3	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA
Benzo(g,h,i)perylene	NE	NE	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA
Benzo(k)fluoranthene	0.5	0.3	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA
Chrysene	NE	NE	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA
Dibenzo(a,h)anthracene	NE	NE	< 0.01	< 0.01	NA	NA	< 0.01	NA	NA	NA	< 0.01	< 0.01	NA	NA	NA
Fluoranthene	280	3700	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA
Fluorene	280	140000	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	**0.29**	< 0.05	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NE	NE	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA
Naphthalene	280	NE	< 0.09	< 0.10	NA	NA	< 0.09	NA	NA	NA	**0.31**	< 0.09	NA	NA	NA
Phenanthrene	200	**0.077**	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA
Pyrene	200	110000	< 0.05	< 0.05	NA	NA	< 0.05	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA
Metals (mg/L)															
Antimony	**0.006**	86	< 0.005	< 0.005	NA	NA	< 0.005	NA	NA	NA	< 0.005	< 0.005	NA	NA	NA
Arsenic	0.05	**0.004**	< 0.004	**0.015**	NA	NA	< 0.004	NA	NA	NA	**0.007**	< 0.004	NA	NA	NA
Barium	**1**	*2.2*	**0.068**	**0.201**	NA	NA	**0.105**	NA	NA	NA	**0.429**	**0.037**	NA	NA	NA
Beryllium	0.004	0.004	< 0.001	**0.001**	NA	NA	< 0.001	NA	NA	NA	< 0.001	< 0.001	NA	NA	NA
Cadmium	0.005	0.006	< 0.001	< 0.001	NA	NA	< 0.001	NA	NA	NA	< 0.001	< 0.001	NA	NA	NA
Chromium	0.05	NE	< 0.001	**0.006**	NA	NA	< 0.001	NA	NA	NA	**0.002**	< 0.001	NA	NA	NA
Copper	1.3	0.048	< 0.005	**0.048**	NA	NA	**0.014**	NA	NA	NA	< 0.005	< 0.005	NA	NA	NA
Lead	**0.015**	**0.013**	< 0.002	**0.030**	NA	NA	< 0.002	NA	NA	NA	< 0.002	< 0.002	NA	NA	NA
Mercury	0.002	0.0004	< 0.0002	< 0.0002	NA	NA	< 0.0002	NA	NA	NA	< 0.0002	< 0.0002	NA	NA	NA
Nickel	0.1	0.88	< 0.001	**0.012**	NA	NA	**0.003**	NA	NA	NA	**0.005**	**0.007**	NA	NA	NA
Selenium	0.05	0.05	< 0.010	< 0.010	NA	NA	< 0.010	NA	NA	NA	< 0.010	< 0.010	NA	NA	NA
Silver	0.036	0.012	< 0.001	< 0.001	NA	NA	< 0.001	NA	NA	NA	< 0.001	< 0.001	NA	NA	NA
Thallium	0.005	0.063	< 0.001	< 0.001	NA	NA	< 0.0005	NA	NA	NA	< 0.001	< 0.0005	NA	NA	NA
Vanadium	0.05	NE	< 0.002	**0.016**	NA	NA	**0.003**	NA	NA	NA	**0.005**	< 0.002	NA	NA	NA
Zinc	5	**0.123**	< 0.004	**0.009**	NA	NA	**0.007**	NA	NA	NA	**0.024**	**3.69**	NA	NA	NA
Pesticides (ug/L)															
4,4-DDD (p,p)	NE	NE	< 0.047	< 0.047	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4-DDE (p,p)	NE	NE	< 0.047	< 0.047	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4-DDT (p,p)	NE	NE	< 0.047	< 0.047	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alachlor	2	NE	< 0.071	< 0.071	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	NE	NE	< 0.001	< 0.001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	NE	NE	< 0.28	< 0.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	NE	NE	< 0.024	< 0.024	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	0.002	0.1	< 0.001	< 0.001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	NE	NE	< 0.047	< 0.047	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	NE	NE	< 0.047	< 0.047	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	NE	NE	< 0.047	< 0.047	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	NE	0.1	< 0.047	< 0.047	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NE	< 0.047	< 0.047	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	NE	< 0.047	< 0.047	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	0.4	0.05													
Heptachlor epoxide	0.2	0.05	< 0.024	< 0.024	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclohexane, alpha	NE	NE	< 0.024	< 0.024	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclohexane, beta	NE	NE	< 0.005	< 0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclohexane, gamma (Lindane)	0.2	NE	< 0.024	< 0.024	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	40	NE	< 0.094	< 0.094	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	3	1	< 0.94	< 0.94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB Homologs (ug/L)															
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0048	< 0.0049	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0062	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0045	< 0.0050
Dichlorobiphenyl	NE	NE	< 0.00096	< 0.00098	**0.013**	< 0.0010	**0.0049**	**0.25**	< 0.0012	**0.10**	**6.3**	**0.47**	**0.045**	< 0.00091	< 0.0010
Heptachlorobiphenyl	NE	NE	< 0.0029	< 0.0029	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0037	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0027	< 0.0030
Hexachlorobiphenyl	NE	NE	< 0.0019	< 0.0020	**0.0030**	< 0.0020	< 0.0020	< 0.0020	**0.0044**	< 0.0020	**0.0047**	**0.0036**	**0.0025**	< 0.0018	< 0.0020
Monochlorobiphenyl	NE	NE	< 0.00096	< 0.00098	**0.0012**	**0.0011**	**0.0034**	**0.024**	< 0.0012	**0.031**	**7.4**	**0.0036**	**0.0032**	< 0.00091	< 0.0010
Nonachlorobiphenyl	NE	NE	< 0.0048	< 0.0049	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0062	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0045	< 0.0050
Octachlorobiphenyl	NE	NE	< 0.0029	< 0.0029	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0037	< 0.0030	< 0.0030	< 0.0030	< 0.0030	< 0.0027	< 0.0030
Pentachlorobiphenyl	NE	NE	< 0.0019	< 0.0020	**0.043**	< 0.0020	**0.0085**	**0.016**	**0.0065**	< 0.0020	**0.047**	**0.071**	**0.010**	**0.0039**	< 0.0020
Tetrachlorobiphenyl	NE	NE	< 0.0019	< 0.0020	**0.14**	< 0.0020	**0.048**	**0.11**	**0.0039**	**0.024**	**0.33**	**0.66**	**0.015**	**0.019**	**0.0025**
Trichlorobiphenyl	NE	NE	< 0.00096	< 0.00098	**0.086**	< 0.0010	**0.013**	**0.12**	< 0.0012	**0.057**	**1.1**	**2.6**	**0.036**	**0.0087**	< 0.0010
Total PCB Homologues	**0.5**	**0.5**	ND	ND	**0.28**	**0.0011**	**0.077**	**0.52**	**0.015**	**0.22**	**15.0**	**3.8**	**0.11**	**0.031**	**0.0025**

Notes:
This is a summary table. Only detected compounds are presented.
Bold = Detected above reporting limit
Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CTDEEP approval to implement. 0.25 mg/l is the proposed GWPC.
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Action Level set by the Connecticut Department of Public Health.

Table 3
Groundwater Analytical Results - September 2018

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-AM16 MW-AM16R-092718-1 9/27/2018 18I1258	MW-AM16D MW-AM16D-092718-1 9/27/2018 18I1258	MW-AM21 MW-AM21-092718-1 9/27/2018 18I1338	MW-AP11 MW-AP11-092618-1 9/26/2018 18I1195	MW-AP28 MW-AP28-092718-1 9/27/2018 18I1258	MW-AV17 MW-AV17-092718-1 9/27/2018 18I1258	MW-F35 MW-F35-092818-1 9/28/2018 18I1338	MW-L25 MW-L25-092818-1 9/28/2018 18I1338	MW-P11 MW-P11-092518-1 9/25/2018 18I1109	MW-P7 MW-P7-092518-1 9/25/2018 18I1109	MW-R20 MW-R20-092818-1 9/28/2018 18I1338	MW-R20 DUP MW-R20-092818-2 9/28/2018 18I1338	MW-S15 MW-S15 092518-1 9/25/2018 GCB38518
PAHs (ug/L)															
2-Methylnaphthalene	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Acenaphthene	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Acenaphthylene	420	0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Anthracene	2000	1.1e+006	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Benzo(a)anthracene	0.06	0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Benzo(a)pyrene	0.2	0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Benzo(b)fluoranthene	0.08	0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Benzo(g,h,i)perylene	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	**0.19**
Benzo(k)fluoranthene	0.5	0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Chrysene	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Dibenzo(a,h)anthracene	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.01	NA	NA	**0.13**
Fluoranthene	280	3700	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Fluorene	280	140000	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Indeno(1,2,3-cd)pyrene	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	**0.18**
Naphthalene	280	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.09	NA	NA	< 0.09
Phenanthrene	200	**0.077**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Pyrene	200	110000	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	NA	NA	< 0.05
Metals (mg/L)															
Antimony	**0.006**	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.005	NA	NA	< 0.005
Arsenic	0.05	**0.004**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.004	NA	NA	**0.007**
Barium	**1**	*2.2*	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.145**	NA	NA	**0.134**
Beryllium	0.004	0.004	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.001	NA	NA	< 0.001
Cadmium	0.005	0.006	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.001	NA	NA	< 0.001
Chromium	0.05	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.001	NA	NA	**0.002**
Copper	1.3	0.048	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.005	NA	NA	< 0.005
Lead	**0.015**	**0.013**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.002	NA	NA	< 0.002
Mercury	0.002	0.0004	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0002	NA	NA	< 0.0002
Nickel	0.1	0.88	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.003**	NA	NA	< 0.001
Selenium	0.05	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.010	NA	NA	< 0.010
Silver	0.036	0.012	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.001	NA	NA	< 0.001
Thallium	0.005	0.063	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0005	NA	NA	< 0.0005
Vanadium	0.05	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.002	NA	NA	**0.004**
Zinc	5	**0.123**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.010**	NA	NA	< 0.004
Pesticides (ug/L)															
4,4-DDD (p,p)	NE	NE	< 0.049	NA	NA	NA	NA	< 0.047	NA	NA	NA	NA	NA	NA	< 0.047
4,4-DDE (p,p)	NE	NE	< 0.049	NA	NA	NA	NA	< 0.047	NA	NA	NA	NA	NA	NA	< 0.047
4,4-DDT (p,p)	NE	NE	< 0.049	NA	NA	NA	NA	< 0.047	NA	NA	NA	NA	NA	NA	< 0.047
Alachlor	2	NE	< 0.074	NA	NA	NA	NA	< 0.071	NA	NA	NA	NA	NA	NA	< 0.071
Aldrin	NE	NE	< 0.050	NA	NA	NA	NA	< 0.001	NA	NA	NA	NA	NA	NA	< 0.001
Chlordane	NE	NE	< 0.29	NA	NA	NA	NA	< 0.28	NA	NA	NA	NA	NA	NA	< 0.28
delta-BHC	NE	NE	< 0.050	NA	NA	NA	NA	< 0.024	NA	NA	NA	NA	NA	NA	< 0.024
Dieldrin	0.002	0.1	< 0.002	NA	NA	NA	NA	< 0.001	NA	NA	NA	NA	NA	NA	< 0.001
Endosulfan I	NE	NE	< 0.049	NA	NA	NA	NA	< 0.047	NA	NA	NA	NA	NA	NA	< 0.047
Endosulfan II	NE	NE	< 0.049	NA	NA	NA	NA	< 0.047	NA	NA	NA	NA	NA	NA	< 0.047
Endosulfan sulfate	NE	NE	< 0.049	NA	NA	NA	NA	< 0.047	NA	NA	NA	NA	NA	NA	< 0.047
Endrin	NE	0.1	< 0.049	NA	NA	NA	NA	< 0.047	NA	NA	NA	NA	NA	NA	< 0.047
Endrin aldehyde	NE	NE	< 0.049	NA	NA	NA	NA	< 0.047	NA	NA	NA	NA	NA	NA	< 0.047
Endrin ketone	NE	NE	< 0.049	NA	NA	NA	NA	< 0.047	NA	NA	NA	NA	NA	NA	< 0.047
Heptachlor	0.4	0.05													
Heptachlor epoxide	0.2	0.05	< 0.025	NA	NA	NA	NA	< 0.024	NA	NA	NA	NA	NA	NA	< 0.024
Hexachlorocyclohexane, alpha	NE	NE	< 0.025	NA	NA	NA	NA	< 0.024	NA	NA	NA	NA	NA	NA	< 0.024
Hexachlorocyclohexane, beta	NE	NE	< 0.030	NA	NA	NA	NA	< 0.005	NA	NA	NA	NA	NA	NA	< 0.005
Hexachlorocyclohexane, gamma (Lindane)	0.2	NE	< 0.025	NA	NA	NA	NA	< 0.024	NA	NA	NA	NA	NA	NA	< 0.024
Methoxychlor	40	NE	< 0.098	NA	NA	NA	NA	< 0.094	NA	NA	NA	NA	NA	NA	< 0.094
Toxaphene	3	1	< 0.98	NA	NA	NA	NA	< 0.94	NA	NA	NA	NA	NA	NA	< 0.94
PCB Homologs (ug/L)															
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0051	< 0.0050	< 0.0049	< 0.0050	< 0.0050	< 0.0050	< 0.0045	< 0.0048	< 0.0047	< 0.0050	< 0.0048	< 0.0050	< 0.0047
Dichlorobiphenyl	NE	NE	**0.10**	< 0.0010	< 0.00098	**0.0017**	< 0.0010	< 0.0010	**0.0056**	< 0.00095	< 0.00094	< 0.0010	< 0.00095	< 0.0010	**0.0036**
Heptachlorobiphenyl	NE	NE	< 0.0031	< 0.0030	< 0.0029	< 0.0030	< 0.0030	< 0.0030	< 0.0027	< 0.0029	< 0.0028	< 0.0030	< 0.0029	< 0.0030	< 0.0028
Hexachlorobiphenyl	NE	NE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0018	< 0.0019	< 0.0019	< 0.0020	< 0.0019	< 0.0020	< 0.0019
Monochlorobiphenyl	NE	NE	**0.010**	< 0.0010	< 0.00098	< 0.0010	< 0.0010	< 0.0010	**0.0011**	< 0.00095	< 0.00094	< 0.0010	< 0.00095	< 0.0010	< 0.00095
Nonachlorobiphenyl	NE	NE	< 0.0051	< 0.0050	< 0.0049	< 0.0050	< 0.0050	< 0.0050	< 0.0045	< 0.0048	< 0.0047	< 0.0050	< 0.0048	< 0.0050	< 0.0047
Octachlorobiphenyl	NE	NE	< 0.0031	< 0.0030	< 0.0029	< 0.0030	< 0.0030	< 0.0030	< 0.0027	< 0.0029	< 0.0028	< 0.0030	< 0.0029	< 0.0030	< 0.0028
Pentachlorobiphenyl	NE	NE	**0.028**	**0.0025**	**0.012**	< 0.0020	< 0.0020	< 0.0020	< 0.0018	< 0.0019	< 0.0019	< 0.0020	< 0.0019	< 0.0020	**0.0027**
Tetrachlorobiphenyl	NE	NE	**0.20**	**0.015**	**0.029**	< 0.0020	< 0.0020	**0.0063**	< 0.0018	< 0.0019	< 0.0019	< 0.0020	< 0.0019	< 0.0020	**0.018**
Trichlorobiphenyl	NE	NE	**0.19**	**0.0050**	< 0.00098	< 0.0010	< 0.0010	< 0.0010	**0.0062**	< 0.00095	< 0.00094	< 0.0010	< 0.00095	< 0.0010	**0.017**
Total PCB Homologues	**0.5**	**0.5**	**0.54**	**0.022**	**0.041**	**0.0017**	ND	**0.0063**	**0.013**	ND	ND	ND	ND	ND	**0.041**

Notes:
This is a summary table. Only detected compounds are presented.
Bold = Detected above reporting limit
Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
SWPC = Surface water protection criteria.
NE = Criteriion has not been established
NS = Not Sampled for Specific Analyte
ug/L = microgram per liter
NS = Not sampled for this constituent..
mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CTDEEP app
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Action Level se

Table 3
Groundwater Analytical Results - September 2018

Location ID Sample ID Sample Date SDG	GWPC	SWPC	MW-S15 DUP MW-S15-092518-2 9/25/2018 18I1109	MW-T23 MW-T23-092818-1 9/28/2018 18I1338	MW-V18 MW-V18-092618-1 9/26/2018 18I1195	MW-X17 MW-X17-092618-1 9/26/2018 18I1195	MW-Y15 MW-Y15-092618-1 9/26/2018 18I1195	MW-Y15D MW-Y15D-092618-1 9/26/2018 18I1195	MW-Y26 MW-Y26-092818-1 9/28/2018 18I1338	MW-Y9 MW-Y9-092618-1 9/26/2018 18I1195	MW-Y9D MW-Y9D-092618-1 9/26/2018 18I1195
PAHs (ug/L)											
2-Methylnaphthalene	NE	NE	< 0.05	NA	NA	NA	**0.08**	NA	NA	< 0.05	NA
Acenaphthene	NE	NE	< 0.05	NA	NA	NA	**0.53**	NA	NA	< 0.05	NA
Acenaphthylene	420	0.3	< 0.05	NA	NA	NA	< 0.05	NA	NA	< 0.05	NA
Anthracene	2000	1.1e+006	< 0.05	NA	NA	NA	**0.08**	NA	NA	< 0.05	NA
Benzo(a)anthracene	0.06	0.3	< 0.05	NA	NA	NA	< 0.05	NA	NA	< 0.05	NA
Benzo(a)pyrene	0.2	0.3	< 0.05	NA	NA	NA	< 0.05	NA	NA	< 0.05	NA
Benzo(b)fluoranthene	0.08	0.3	< 0.05	NA	NA	NA	< 0.05	NA	NA	< 0.05	NA
Benzo(g,h,i)perylene	NE	NE	< 0.05	NA	NA	NA	< 0.05	NA	NA	< 0.05	NA
Benzo(k)fluoranthene	0.5	0.3	< 0.05	NA	NA	NA	< 0.05	NA	NA	< 0.05	NA
Chrysene	NE	NE	< 0.05	NA	NA	NA	< 0.05	NA	NA	< 0.05	NA
Dibenzo(a,h)anthracene	NE	NE	< 0.01	NA	NA	NA	< 0.01	NA	NA	< 0.01	NA
Fluoranthene	280	3700	< 0.05	NA	NA	NA	< 0.05	NA	NA	< 0.05	NA
Fluorene	280	140000	< 0.05	NA	NA	NA	**0.31**	NA	NA	< 0.05	NA
Indeno(1,2,3-cd)pyrene	NE	NE	< 0.05	NA	NA	NA	< 0.05	NA	NA	< 0.05	NA
Naphthalene	280	NE	< 0.09	NA	NA	NA	< 0.09	NA	NA	< 0.09	NA
Phenanthrene	200	**0.077**	< 0.05	NA	NA	NA	**0.09**	NA	NA	< 0.05	NA
Pyrene	200	110000	< 0.05	NA	NA	NA	< 0.05	NA	NA	< 0.05	NA
Metals (mg/L)											
Antimony	**0.006**	86	< 0.005	NA	NA	NA	< 0.005	NA	NA	**0.021**	NA
Arsenic	0.05	**0.004**	**0.006**	NA	NA	NA	< 0.004	NA	NA	**0.007**	NA
Barium	**1**	*2.2*	**0.132**	NA	NA	NA	**0.584**	NA	NA	**1.25**	NA
Beryllium	0.004	0.004	< 0.001	NA	NA	NA	< 0.001	NA	NA	< 0.001	NA
Cadmium	0.005	0.006	< 0.001	NA	NA	NA	< 0.001	NA	NA	< 0.001	NA
Chromium	0.05	NE	**0.001**	NA	NA	NA	< 0.001	NA	NA	< 0.001	NA
Copper	1.3	0.048	< 0.005	NA	NA	NA	< 0.005	NA	NA	< 0.005	NA
Lead	**0.015**	**0.013**	< 0.002	NA	NA	NA	**0.002**	NA	NA	**0.007**	NA
Mercury	0.002	0.0004	< 0.0002	NA	NA	NA	< 0.0002	NA	NA	< 0.0002	NA
Nickel	0.1	0.88	< 0.001	NA	NA	NA	**0.002**	NA	NA	**0.005**	NA
Selenium	0.05	0.05	< 0.010	NA	NA	NA	< 0.010	NA	NA	< 0.010	NA
Silver	0.036	0.012	< 0.001	NA	NA	NA	< 0.001	NA	NA	< 0.001	NA
Thallium	0.005	0.063	< 0.0005	NA	NA	NA	< 0.0005	NA	NA	< 0.0005	NA
Vanadium	0.05	NE	**0.004**	NA	NA	NA	**0.003**	NA	NA	**0.004**	NA
Zinc	5	**0.123**	< 0.004	NA	NA	NA	**0.017**	NA	NA	**0.009**	NA
Pesticides (ug/L)											
4,4-DDD (p,p)	NE	NE	< 0.047	NA	NA	NA	< 0.047	NA	NA	< 0.047	NA
4,4-DDE (p,p)	NE	NE	< 0.047	NA	NA	NA	< 0.047	NA	NA	< 0.047	NA
4,4-DDT (p,p)	NE	NE	< 0.047	NA	NA	NA	< 0.047	NA	NA	< 0.047	NA
Alachlor	2	NE	< 0.071	NA	NA	NA	< 0.071	NA	NA	< 0.071	NA
Aldrin	NE	NE	< 0.005	NA	NA	NA	< 0.001	NA	NA	< 0.001	NA
Chlordane	NE	NE	< 0.28	NA	NA	NA	< 0.28	NA	NA	< 0.28	NA
delta-BHC	NE	NE	< 0.024	NA	NA	NA	< 0.024	NA	NA	< 0.024	NA
Dieldrin	0.002	0.1	< 0.001	NA	NA	NA	< 0.001	NA	NA	< 0.001	NA
Endosulfan I	NE	NE	< 0.047	NA	NA	NA	< 0.047	NA	NA	< 0.047	NA
Endosulfan II	NE	NE	< 0.047	NA	NA	NA	< 0.047	NA	NA	< 0.047	NA
Endosulfan sulfate	NE	NE	< 0.047	NA	NA	NA	< 0.047	NA	NA	< 0.047	NA
Endrin	NE	0.1	< 0.047	NA	NA	NA	< 0.047	NA	NA	< 0.047	NA
Endrin aldehyde	NE	NE	< 0.047	NA	NA	NA	< 0.047	NA	NA	< 0.047	NA
Endrin ketone	NE	NE	< 0.047	NA	NA	NA	< 0.047	NA	NA	< 0.047	NA
Heptachlor	0.4	0.05									
Heptachlor epoxide	0.2	0.05	< 0.024	NA	NA	NA	< 0.024	NA	NA	< 0.024	NA
Hexachlorocyclohexane, alpha	NE	NE	< 0.024	NA	NA	NA	< 0.024	NA	NA	< 0.024	NA
Hexachlorocyclohexane, beta	NE	NE	< 0.005	NA	NA	NA	< 0.050	NA	NA	< 0.050	NA
Hexachlorocyclohexane, gamma (Lindane)	0.2	NE	< 0.024	NA	NA	NA	< 0.024	NA	NA	< 0.024	NA
Methoxychlor	40	NE	< 0.094	NA	NA	NA	< 0.094	NA	NA	< 0.094	NA
Toxaphene	3	1	< 0.94	NA	NA	NA	< 0.94	NA	NA	< 0.94	NA
PCB Homologs (ug/L)											
Decachlorobiphenyl (PCB-209)	NE	NE	< 0.0046	< 0.0050	< 0.0051	< 0.0052	< 0.0050	< 0.0050	< 0.0048	< 0.0050	< 0.0052
Dichlorobiphenyl	NE	NE	**0.0071**	< 0.0010	**0.014**	**0.0042**	**9.6**	< 0.0010	< 0.00096	< 0.0010	**0.0076**
Heptachlorobiphenyl	NE	NE	< 0.0028	< 0.0030	< 0.0031	< 0.0031	< 0.0030	< 0.0030	< 0.0029	< 0.0030	< 0.0031
Hexachlorobiphenyl	NE	NE	< 0.0018	< 0.0020	< 0.0020	< 0.0021	**0.0022**	< 0.0020	< 0.0019	**0.0042**	< 0.0021
Monochlorobiphenyl	NE	NE	< 0.00092	< 0.0010	**0.0011**	**0.0016**	**9.7**	**0.0014**	< 0.00096	< 0.0010	**0.0082**
Nonachlorobiphenyl	NE	NE	< 0.0046	< 0.0050	< 0.0051	< 0.0052	< 0.0050	< 0.0050	< 0.0048	< 0.0050	< 0.0052
Octachlorobiphenyl	NE	NE	< 0.0028	< 0.0030	< 0.0031	< 0.0031	< 0.0030	< 0.0030	< 0.0029	< 0.0030	< 0.0031
Pentachlorobiphenyl	NE	NE	**0.0027**	< 0.0020	< 0.0020	< 0.0021	**0.041**	< 0.0020	< 0.0019	**0.013**	< 0.0021
Tetrachlorobiphenyl	NE	NE	**0.024**	< 0.0020	**0.022**	< 0.0021	**0.30**	< 0.0020	< 0.0019	**0.0092**	< 0.0021
Trichlorobiphenyl	NE	NE	**0.016**	< 0.0010	**0.039**	**0.0035**	**1.4**	< 0.0010	< 0.00096	< 0.0010	< 0.0010
Total PCB Homologues	**0.5**	**0.5**	**0.050**	ND	**0.075**	**0.0093**	**21**	**0.0014**	ND	**0.026**	**0.016**

Notes:
This is a summary table. Only detected compounds are presented.
Bold = Detected above reporting limit
Orange highlighted cells exceed GWPC.
Yellow highlighted cells exceed SWPC.
<0.01 = Not detected above the specified laboratory reporting limit
GWPC = Ground water protection criteria.
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mg/L = miligram per Liter
(1) 0.1 mg/l is the current recommended screening criteria and requires CTDEEP app
(2) 100 ug/l is the promulgated GWPC. 70 ug/l is the Drinking Water Action Level se

Table 4
Quarterly Groundwater Elevations
Greenwich High School

Well ID	Well Casing Elevation (ft amsl)	4/10/2017	8/14/2017	11/13/2017	3/5/2018	6/25/2018	9/24/2018
MW-28	45.61	43.30	42.07	42.79	43.31	42.67	42.77
MW-35	27.38	25.32	21.15	23.68	25.43	23.22	24.84
MW-AA12	53.65	48.89	48.14	47.07	47.96	48.48	48.13
MW-AA12-D	53.93	NA	44.17	44.55	46.75	44.62	44.95
MW-AA19	52.47	46.58	44.54	44.77	46.8	45.26	NA
MW-AE8	51.99	46.04	44.11	44.59	46.21	44.53	44.92
MW-AG10	52.87	48.75	48.16	47.51	48.19	48.13	48.13
MW-AG30	55.30	49.61	48.36	48.42	49.64	48.72	48.81
MW-AH16	52.61	NA	NA	NA	NA	NA	NA
MW-AH16R	48.57	47.17	47.04	46.62	47.48	47.26	47.35
MW-AH16-D	48.57	NA	NA	NA	NA	NA	45.16
MW-AJ13	53.79	46.06	44.01	44.49	47.3	43.88	44.99
MW-AJ13-D	53.65	NA	43.93	44.43	47.25	44.62	44.95
MW-AJ19	48.1	45.10	45.59	44.90	45.25	45.76	43.86
MW-AL10	55.45	NA	48.35	48.35	50.36	48.63	49.1
MW-AM16	53.46	47.96	44.60	45.11	48.35	46.36	45.83
MW-AM16-D	53.47	NA	44.23	43.67	47.88	44.8	45.24
MW-AM21	51.41	49.06	47.27	44.71	48	45.71	47.66
MW-AP11	52.84	46.09	NA	NA	47.46	NA	45.58
MW-AP28	55.26	51.16	48.17	48.21	NA	48.75	48.93
MW-AV17	55.08	48.58	43.44	44.82	49.19	45.1	45.46
MW-BB34	55.69	53.14	47.18	46.77	53.04	NA	NA
MW-F35	39.03	36.68	36.38	36.43	36.68	36.57	36.63
MW-L25	46.29	43.42	42.51	43.01	43.42	43.11	43.18
MW-P11	52.12	45.50	43.93	44.17	45.54	44.2	44.58
MW-P7	49.64	44.70	43.68	43.91	44.88	43.94	44.09
MW-R20	51.12	48.37	43.93	45.39	48.58	44.26	46.94
MW-S15	52.43	45.90	43.70	44.03	45.95	44.15	44.42
MW-T23	53.18	46.36	45.85	45.98	46.36	46.14	46.13
MW-V12	53.30	46.52	44.07	45.91	47.31	NA	NA
MW-V18	51.22	46.17	44.08	44.48	46.32	44.51	44.91
MW-WEST	52.58	NA	NA	NA	NA	NA	52.58
MW-X17	51.79	45.74	44.04	44.33	46.17	44.49	44.67
MW-Y15	57.58	46.03	45.96	46.48	46.39	46.02	46.03
MW-Y15-D	51.47	NA	44.00	44.39	45.62	44.52	44.75
MW-Y26	55.43	49.00	47.79	47.88	48.96	47.98	48.33
MW-Y9	51.47	50.70	48.35	48.55	50.44	48.31	49.97
MW-Y9-D	51.71	NA	44.00	44.38	46.51	44.48	44.79
PZ-AE16	52.41	NA	NA	NA	NA	NA	52.41
PZ-AG18	48.08	44.83	45.51	NA	44.97	45.57	44.79
PZ-AH19	48.42	NA	NA	NA	NA	NA	NA
PZ-AM22	51.69	44.41	NA	NA	48.15	45.21	45.74
SG-31	29.54	20.51	NA	NA	NA	NA	NA
SG-A29	45.84	NA	NA	NA	NA	NA	NA
SG-A30	32.40	NA	NA	NA	NA	NA	NA
SG-AS10	49.87	NA	NA	NA	NA	NA	NA
SG-K24	46.02	44.96	NA	NA	NA	NA	NA

Notes:
NA = Not Available

Table 5
Rising Head Slug Test - Hydraulic Conductivity (K) Results
Greenwich High School

Monitoring Well ID	Hydraulic Conductivity Test Results (cm/s)	Average Hydraulic Conductivity* (cm/s)	Average Hydraulic Conductivity* (feet/day)	Geology of Screened Invertal
MW-Y9	7.74E-03	7.23E-03	20.5	Fill &Peat
	6.82E-03			
	7.13E-03			
MW-Y15	5.55E-03	5.39E-03	15.3	Medium Sand & Peat**
	5.47E-03			
	5.16E-03			
MW-AA12	Rapid water level response to slug test. Too few displacement points for evaluation.	Unquantified, but greater than other locations.	Unquantified, but greater than other locations.	Fill
MW-AJ13	1.47E-03	1.52E-03	4.3	Medium Sand
	1.68E-03			
	1.41E-03			
MW-AM16	1.23E-02	1.04E-02	29.5	Medium Sand & Peat**
	9.74E-03			
	9.08E-03			
Shallow Aquifer		**4.98E-03**	**14.1**	Fill & Medium Sand
MW-Y9D	2.24E-03	2.17E-03	6.2	Medium Sand (Till)
	2.17E-03			
	2.10E-03			
MW-Y15D	1.37E-03	1.31E-03	3.7	Medium Sand (Till)
	1.34E-03			
	1.24E-03			
MW-AA12D	6.05E-02	6.46E-02	183.1	Medium Sand (Till)
	6.27E-02			
	7.05E-02			
MW-AJ13D	3.18E-03	3.27E-03	9.3	Medium Sand (Till)
	3.25E-03			
	3.37E-03			
MW-AM16D	9.01E-03	8.19E-03	23.2	Silt & Medium Sand (Till)**
	7.93E-03			
	7.62E-03			
Deep Aquifer		**5.48E-03**	**15.5**	Fill & Medium Sand

Notes:

* The arithmetic mean of three tests was taken to calculate the average hydraulic conductivity at each well, and the geometric mean of the hydraulic conductivity values for each well was calculated to estimate the hydraulic conductivity of the aquifer.
** The hydraulic conductivity of the well was estimated assuming that the low permeability silt and peat within the screened interval did not contribute significant water during the slug tests.
cm/s = centimeters per second

Appendix A

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

January 5, 2015

Amy J. Siebert, PE
Commissioner
Town of Greenwich
Department of Public Works
Town Hall
101 Field Point Rd.
Greenwich, CT 06836

Dear Ms. Siebert:

The Connecticut Department of Energy and Environmental Protection Storage Tank & PCB Enforcement Unit and Remediation Division (DEEP) and U.S. EPA (EPA) staff have completed their review of the *Response to Comments Remedial Action Plan Greenwich High School* document (Response) dated October 21, 2014 and information provided to EPA and DEEP during the October 23, 2014 meeting in response to our March 5, 2014 letter requesting additional information and clarification, as well as the October 30, 2014 request to seek approval of same pursuant to CGS 22a-467. DEEP recognizes the significant efforts made by the Town in moving this project forward. Based on that review, as well as the discussions and presentation by your consultant, AECOM, at that meeting, DEEP and EPA have identified the issues and questions presented below. The majority of the numbered comments presented by this letter and the attached memorandum have been previously communicated to the Town of Greenwich (the Town) or the Town's environmental consultant AECOM. This letter is based on the information submitted and is intended to be a comprehensive list of the items that need to be addressed. This letter may be useful as a checklist of discussion items for our meeting scheduled for January 7, 2015.

It is critical that the clean-up goals for Greenwich High School be protective of human health and the environment. The pathway to this is provided in the Remediation Standard Regulations (the RSRs) sections 22a-133k-1 to 22a-133k-3 of the Regulations of Connecticut State Agencies (RCSA). The RSRs establish soil, groundwater and soil vapor clean up goals by defining minimum performance standards, specifying numeric clean-up criteria, and establishing a process for alternative site-specific criteria.

The Department recommends that the Town of Greenwich enter into the voluntary remediation program described in section 22a-133x of the Connecticut General Statutes. The benefits of such a clean-up will help ensure both the short term and long term protectiveness of the remedy and help assure the public that the remedy is well vetted.

1. Page 1 paragraph 3 of the response states, "In addition, the 6-inch stone base layer for this field provides additional drainage capacity."

   The basis for this statement is not clear. As depicted in the materials provided in Attachment 7 (Typical Transverse Detail Forever-Drain Drainage Mat, and Forever Drain "technical specifications sheet"), it appears that the drainage mat (with a non-perforated underside) overlaying 6-inch crushed stone is designed to shunt infiltrating precipitation to the drains on the edge of the field. It would, therefore, be reasonable to expect that little water infiltrates below the drainage mat.

   However, if the back of the mat is perforated, then the capacity of the 6-inch crushed stone layer (which presumably was well compacted) can be estimated and the likelihood of an extreme precipitation event causing groundwater mounding (see next item) evaluated.

   Clarification of the precise design of the turf fields and the functionality of the subsurface layers and drainage is necessary.

2. Page 1 paragraph 4 of the response states, "... a groundwater mound is typically observed beneath Field #3. An extreme precipitation event could increase the elevation of the observed mound."

   However, elsewhere in the Response, as well as the discussions at the October 23 meeting, it appears the argument is being made that increased mounding is unlikely to occur.
   Clarification is necessary regarding the issue of the effect of storm events on the mounding. In addition, answers are needed to the following: What is the cause of the mounding? Does the mounding influence the movement of contaminants in groundwater in that area of the site?

3. Page 2, bullet point 5, discusses that the aquifer is homogeneous with no features that would generate a preferential flow.

   However, old aerial photographs suggest there may be have been a stream channel through the former wetland swamp. It has been previously explained that the Brothers Brook was re-routed during site development. What impact the former channel may have on the groundwater flow beneath the athletic fields, particularly fields 2-4 is not discussed.

   Further evaluation of this issue is needed.

4. Page 2, bullet point 7, describes the brook as being at a lower groundwater elevation.

The brook elevation is artificial, not necessarily an expression of groundwater elevation. *Answers to the following questions are needed to clarify this point: Is the brook at a lower groundwater elevation? Is it a gaining stream normally? Is it a gaining stream during extreme precipitation events?*

5. Page 2, bullet point 8, discusses that flow through the aquifer is horizontal and goes on to explain that due to lack of accounting of vertical flow, predictions can be off and that a 15% correction factor was built in.

   It does not appear that the groundwater monitoring array is sufficient in vertical profile to support this statement. No information is provided concerning the vertical extent and degree of the PCB plume in groundwater. No information is provided concerning the vertical component of the hydraulic gradient.

   This remains an open issue that must be addressed before conclusions regarding the extent of groundwater contamination, particularly PCB contamination can be justified.

6. Page 3, first 4 bullet points, discuss infiltration rates of undeveloped glacial deposits.

   However, since the site is filled with sand, cinders, ash, etc. it is not clear how the infiltration rate will be effected, nor is there an accounting of the potential differing infiltration rates throughout the different materials across the site.

   Further information and explanation is needed determine the validity of the use of the rates used in evaluating the groundwater behavior at the site.

7. Page 3, bullet point 5, discusses that "... water is observed to pond over..." certain locations.

   The source of the water is not discussed beyond the implication that it is surface runoff. *However, the possibility that it is groundwater breaching the ground surface must be further evaluated.*

8. Page 3, bullet point 5, discusses the use of monitoring wells MW-AG18 and MW-AH19 as reference wells for groundwater elevation.

   These wells are located in the parking lot to the east of the athletic fields and east of closer monitoring wells deemed unsuitable for groundwater elevation monitoring. Due to the impervious cover (asphalt parking lot) these monitoring wells may be slower to respond to infiltration events, be less impacted (increased groundwater elevation) and generally have a lower groundwater elevation.

   Further discussion of the selection process for the reference wells including justification for that selection is needed.

9. Page 5, paragraph 1, "... potential breakout of groundwater at the surface..."

The potential breakout of groundwater to the ground surface needs to be evaluated.

10. Page 5, bullet point 4, "... could potentially raise groundwater elevations beneath the grass apron between Fields #3 and #4 to the ground surface."

    The potential breakout of groundwater to the ground surface needs to be evaluated.

11. Describe the range of groundwater elevations in the area of MW-AH16.

    Evaluate whether groundwater breaches the surface at this location. Evaluate if PCB polluted groundwater could be transported to the surface, present in any puddles, or remain on the soil after the water recedes?

12. Page 6, PCBs were detected in samples of materials (filter fabric and stone sub-base) beneath the artificial turf fields 3 and 4.

    Given the identification of PCBs in components of the artificial turf field sub-base, additional characterization of these materials is warranted.

    Please provide a proposal for additional sampling of all components of all artificial turf fields at the site. Further evaluation is needed of the components of the turf fields (3 & 4) and their drainage layers (including surface, gravel, fabric and sediment between layers) to determine the extent, and if possible the origin, of the PCBs present.

13. Page 7, The discussion of possible actions to take to address the possibility that PCB polluted groundwater might breach the ground surface at the site, particularly between the western parking lot and fields 3 & 4.

    Based on the analysis provided, some action appears necessary to address the potential for PCB polluted groundwater to breach the ground surface, particularly between the western parking lot and fields 3 & 4. Such solutions need to address the polluted soil acting as the source of groundwater pollution.

    Further discussion regarding the options for addressing this issue as well as justification for a preferred option is needed.

14. Given the issues identified in items 2, 11 and 12 above, it is necessary to address the question of whether sheetflow runoff from Field 3 could contain PCBs from beneath the field, either from PCB in the field components or PCB in groundwater or both.

    Please provide further information, documentation and/or data to address this question.

15. Given the issues identified in items 1, 2, 9 and 10 above, it appears that the groundwater mounding phenomenon in the vicinity of Field 3 remains unexplained. Yet statements

are made in the submittal, on page 5, that the field drains for the turf fields discharge to Brothers Brook at the North and South ends of Field 4.

The possibility exists that the Field 3 drainage system may be malfunctioning, resulting in the formation of a groundwater mound beneath the field. The functionality of the artificial turf field drainage systems needs to be determined.

16. PCBs exist in very shallow (<2' deep) groundwater beneath the parking lot between the school and the athletic fields (PZ-AG18 & PZ-AH19).

    The possibility that this contamination could impact the land surface during periods of flooding must be evaluated.

17. Given the site activities surrounding the MISA project, it is unclear how groundwater withdrawal from the MISA building, or other buildings, affects groundwater flow and migration of the PCB plume.

    Please provide additional data and information regarding this impact in both the short and long term.

18. It is unexplained and unclear, due to the lack of sediment sampling at depth, how PCB contamination got into stream and pond sediments on the site and whether those lower concentration detections are underlain by higher concentrations of PCBs.

    Additional sediment sampling is needed, particularly deeper sediment sampling in Cider Mill Pond and West Brothers Brook.

19. Off-site data from sediment and surface water has not been provided. Therefore, neither the results nor the adequacy of the sampling is able to be evaluated by EPA or DEEP.

    This data needs to be provided so that off-site migration of site contamination may be evaluated. In addition, the discharge from outfall pipes leading from Fields 3 and 4 to Brothers Brook and materials adjacent to the pipes also need to be provided as part of that evaluation.

20. In providing isopleths of the PCB contaminated groundwater, the Response does not address PCB impacts to well MW-S15 which is outside of the mapped PCB plume. Other wells outside of the plume may have been impacted as well.

    This information appears in the March 2013 report. An evaluation of PCB contamination beyond the limits of the mapped plume and the mechanism and source for this contamination must be provided.

21. Please refer to the attached Remediation Division memorandum dated January 5, 2015 for additional comments where clarification is needed.

Thank you for your continued cooperation. Please contact Lori Saliby at 860-424-3329 or Peter Hill at 860-424-3912 if you have any questions prior to our meeting on January 7, 2015. Please provide either the requested information or a schedule for providing the requested information to EPA and DEEP on or before January 21, 2015.

Sincerely,

Mark DeCaprio

Mark DeCaprio, MPH, RS
Director
Emergency Response and Spill
Prevention Division

Patrick Bowe
Director
Remediation Division

cc.: M. Beeler, AECOM
J. Warren, McCarter & English
S. Rusnak, CT DPH

Attachment 1
Greenwich High School
Proposed Remedial Action Plan
Remediation Division Comments
January 2015

General

1. The investigations on which the proposed remedial approaches were developed identify a substance as a constituent of concern (COC) if that substance was identified at concentrations exceeding applicable regulatory criteria. And the extent of investigations performed is based on whether the limits of criteria exceedances have been identified. Limiting the definition of COCs to only substances identified above a regulatory criteria could result in an incomplete investigation of the site. Basing the extent of investigations performed on whether the limits of criteria exceedances has been determined could also result in an incomplete investigation. The definition of COCs must include all substances detected at any concentration.

2. The RAP refers to PRGs (preliminary remedial goals) developed in the HHRA (Human Health Risk Assessment) as remedial standards to be used at the site. Unless a proposal for an alternative criteria is requested, the default criteria in the RSRs are the applicable clean up criteria. Alternative criterion requests will require DPH review and coordination with DEEP.

3. The proposed remedial approach must be consistent with the RSRs. The RAP must include a proposal to address both the direct exposure criteria and the pollutant mobility criteria and other applicable criteria including use of any waivers and exceptions.

4. The lateral and vertical degree and extent of polluted soil, groundwater and sediment associated with the release areas must be determined to properly evaluate remedy options.

AOCs 2 through 6 – Additional PCB Remediation Areas

5. Proposed remedial approach must address PMC exceedances at V21- SB345.

AOC 8 Chlordane Remediation

6. The proposed remedial goal (PRG) for chlordane is 10.8 mg/kg (pg. 1-12) which exceeds the RDEC and GA PMC of the RSR. The default RSR criteria for chlordane are: RDEC 0.49 mg/kg, I/C DEC 2.2 mg/kg, GA PMC 0.066 mg/kg. If the default RSR criteria are not used, a proposal for alternative criteria must be submitted for the Department's review and approval.

AOC 10 Groundwater

7. At this time, the investigation of the degree and extent of groundwater pollution is on-going.

   Consequently, a determination on the suitability of the proposed groundwater remediation plan must be held in abeyance. Following the completion of characterization activities, DEEP will be able to comment on a proposed groundwater remediation strategy.

AOCs 11 and 12 Stream and Pond Sediments

8. Sediment impacts identified and discussed in RI, HHRA and SLERA.

   RAP states that the HHRA determined that there was no risk to human health posed by surface water and sediment. The Department is currently reviewing the HHRA determination and will provide any comments in a separate letter.

   SLERA indicates that impacts may be unacceptable. Additional characterization required. The Department will provide comments in a separate letter.

   Following the completion of characterization activities, the DEEP will provide comments regarding the proposed surface water and sediment remediation strategy.

AOC 13 Southern Arsenic Area and Underground Storage Tank

Arsenic

9. A remedial goal of 20 mg/kg is proposed for arsenic. After consultation with CT DPH, the 20 mg/kg remedial goal is acceptable, subject to certain conditions, such as maintaining cover over areas with concentrations of arsenic still exceeding 10 mg/kg. A proposal for an alternative criteria must be presented. An engineered control application may be needed to make this a durable remedy under the RSRs

10. The RAP should clarify the use of the term "background" in describing the elevated concentrations of arsenic in this area, the use of this term may be somewhat confusing. "Background" appears to suggest a naturally occurring condition, or at least a concentration of arsenic occurring outside a release area. Arsenic in this area is likely anthropogenic in origin, possibly from the use of arsenic as a pesticide on apples or in the former swampy area. The pond on the property is called Cider Mill Pond and the 1968 grading plan identifies the location of various tree species on the property. Apple trees were identified in the list of trees on the site, though the drawing is not clear enough to determine their location.

11. Supplemental investigations were performed in June 2013 to refine the characterization of arsenic in the 0-1 ft. interval in this area. Sample locations are presented on Figures 2-1 and 3-1. Locations depicted are inconsistent between the two diagrams. Corrected sample location mapping must be submitted.

12. Soil samples must be collected and analyzed for constituents of concern at the location of the former UST and associated pipelines.

Areas Not Associated With an AOC

13. Table 1-1 indicates that in the "Non-AOC" AOC, remediation of PCB and ETPH contaminated soil will be performed. Please provide a map and description of where this remediation is proposed.

14. The remedial approach in area of sample location Z26- SB306 must be consistent with the RSRs and address both the pollutant mobility and direct exposure criteria.

15. Supplemental investigations were performed in June 2013 to refine the characterization of Benzo(a)pyrene in this area. Sample locations are presented on Figures 2-1 and 3-1. Locations depicted are inconsistent. Correct sample location mapping must be submitted.

Appendix B



Notes (P&Z Approval FSP No. 2533):

1. Construction shall be in conformance with conditions of approval set forth in IWWA Permit No. 01-165.

2. All sedimentation and erosion controls shall be in place prior to commencing construction.

3. Installation of lights for night athletic events would require approval by the Planning and Zoning Commission.

4. The Board of Education will be responsible for organizing and coordinating parking and shuttle bus service to accommodate parking demand for attendees at school functions and athletic events.

5. Prior to commencing construction, the site contractor shall submit a written schedule of construction activities outlining the methodology for minimizing sedimentation and erosion.

6. Prior to the start of the school year, the Board of Education, in cooperation with the Park and Recreation Department, shall submit a written narrative outlining the anticipated schedule of field use and attendance at athletic events. The summary should include a schedule of games, anticipated attendance, available seating capacity and requirements for sound and pubic address systems.

LEGEND:

-30-	EXISTING CONTOUR	SDMH	STORM DRAIN MANHOLE
× 25.3	EXISTING SPOT ELEVATION	CMP	CORRUGATED METAL PIPE
100	PROPOSED CONTOUR	CPP	CORRUGATED PLASTIC PIPE
× 100.0	PROPOSED SPOT ELEVATION	PVC	POLYVINYL CHLORIDE
	DECIDUOUS TREE	A.O.B.E.	AS ORDERED BY ENGINEER
	CONIFEROUS TREE		HANDICAP PARKING SPACE
	TREE TO BE REMOVED		PROPERTY LINE
	UTILITY POLE	E,T,C	UNDERGROUND UTILITY SERVICES: E=ELECTRIC, T=TELEPHONE, C=CABLE
	SIGN		EXISTING STONE WALL
C.B.	CATCH BASIN		RETAINING WALL

1 INCH = 30 FEET

SCALE 0 30 IN FEET

ROCCO V. D'ANDREA, INC.
• LAND PLANNERS
• ENGINEERS
• SURVEYORS
P.O. BOX 549 RIVERSIDE, CT 06878 — 6 NEIL LANE TEL. 637-1779

REV.	DATE	DESCRIPTION
4	05-04-05	FIELD MODIFICATIONS
3	02-08-05	I.W.W.A. MODIFICATION
2	01-17-05	I.W.W.A. MODIFICATION
1	12-08-04	P & Z / IWWA
0	11-22-04	

ANTHONY L. D'ANDREA, CT PE & LS No. 9673
ENGINEER & SURVEYOR — 05-04-05 DATE

"ONLY COPIES OF THIS PLAN BEARING AN ORIGINAL IMPRINT OF THE ENGINEER'S AND/OR SURVEYOR'S EMBOSSED SEAL ARE TRUE, VALID COPIES."

PROJECT	ATHLETIC FIELD RECONSTRUCTION
PREPARED FOR	GREENWICH HIGH SCHOOL
LOCATION	10 HILLSIDE ROAD GREENWICH, CONNECTICUT
1 OF 6	CONSTRUCTION PLAN

03-5(U)

GHS_04UF_CP_REV4_0.DWG (XSW) 04UF

CONSTRUCTION NOTES

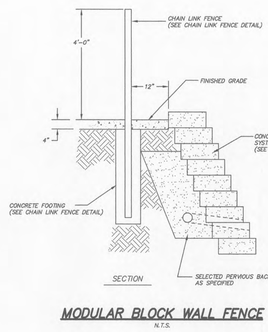
1. Elevations shown are based on the National Geodetic Vertical Datum of 1929 (NGVD29).
2. The information given on this plan with respect to the location of subsurface structures and utilities indicates only that the structures may exist and no responsibility is assumed by the engineer for the accuracy of the locations shown. Utility information is not guaranteed complete or accurate.
3. This site is supplied by the Aquarion Water Company.
4. Prior to any excavation, the contractor, in accordance with Public Act 77-350, shall be required to contact "Call Before You Dig, Inc." at 1-800-922-4455 for mark out of underground utilities.
5. It shall be the responsibility of the contractor to coordinate his work with the work being done by others. No claims will be allowed due to delays or other factors related to the work by others or the contractor's failure to coordinate such work.
6. All construction shall be inspected by a professional engineer prior to backfill and as the work progresses.
7. All construction shall meet or exceed Town of Greenwich and State of Connecticut standards and specifications.
8. A certification to the satisfaction of the Town Engineer shall be submitted by a registered professional engineer declaring that construction has been completed substantially in accordance with the approved plans.
9. All new utilities including electric and telephone shall be installed underground.
10. The supervising engineer and the Town of Greenwich shall be notified three days prior to the commencement of each phase of construction.
11. Existing utilities in conflict through or above this parcel shall be relocated as directed by the appropriate utility company or the Town of Greenwich. The contractor shall excavate test pits to verify the location and depth of utilities where conflicts may exist.
12. Pavement replacement shall be bituminous concrete, placed in accordance with the Town of Greenwich standards and/or Connecticut State Highway specifications.
13. Shoulders and disturbed areas shall receive four inches of topsoil, fine graded and seeded as soon as practical to prevent erosion.
14. The contractor shall not commence any paving until the grading and shaping of the compacted gravel base has been approved by the supervising engineer.
15. Regrading, filling, and other such alterations to the site shall be restricted to the minimum level necessary to complete the project as shown on the plan.
16. Appropriate measures shall be taken to control any sedimentation and erosion which may result during construction.
17. There shall be no dumping of construction debris and/or excess excavated material into or in proximity to any inland wetland areas. All excavated material shall be stockpiled and contained on-site within silt fencing. The contractor shall be responsible for the removal of all excess and unsuitable material excavated during construction. All excess material shall be removed in a careful and environmentally sound manner and shall be disposed of legally off-site. The existing scoreboard, excess topsoil, and excess clean fill that is removed shall remain the property of the Town of Greenwich and shall be transported by the contractor to a site selected by the Town of Greenwich.
18. All traffic control devices including traffic signs and pavement markings shall be installed in conformance with the Manual on Uniform Traffic Control Devices for Streets and Highways, U.S. Department of Transportation, Federal Highway Administration, millennium edition, 2001 as amended to date.
19. All yard drains shall have 2' (minimum) sumps and traps, installed immediately upon making pipe connections, unless noted otherwise.
20. Connection between manholes and 8", 10", 12", and 18" diameter PVC storm drain pipes shall be made with flexible rubber boot type connections sealed water tight with a stainless steel clamp. The contractor shall make sure that all connections of new storm drain pipes to manholes are water tight. Connections to manholes for reinforced concrete storm drain pipes shall be made with with concrete brick masonry and non-shrink grout.
21. Precast concrete cone section to be eccentric. Flat slab tops to have eccentric openings. Eccentric cone sections shall be used when the vertical distance between manhole frame and top of highest pipe is six (6) feet or greater, otherwise flat slab tops shall be used. Aluminum manhole steps (drop form type) shall be provided in all manholes at 12 inch intervals. Each step shall be capable of supporting a minimum load of 1,000 pounds. Wall joints to be "O"-ring" rubber gasket type with the interior and exterior faces of joints to be sealed with waterproof non-shrink grout.
22. Manhole covers for storm drains shall be Campbell Pattern No. 1201 or approved equal.
23. Yard drain frames and grates shall be Campbell Pattern No. 2127 or approved equal.
24. All drainage conduits shall have 2 1/2 foot minimum cover or be encased in concrete if located under a paved traveled way.
25. The supervising engineer with the approval of the Town of Greenwich, may direct a change in the location of the storm drainage structures to meet field conditions.
26. All site drainage connections shall be sloped at 2% (minimum) or as otherwise noted.
27. The contractor shall provide all equipment, tools, labor and materials necessary to satisfactorily clean and remove all visible obstructions, dirt, sand, sludge, roots, gravel, stones, etc., from the storm drains and manholes.
28. Existing inverts on storm drains shall be field verified where appropriate, before commencing construction. The Contractor shall excavate test pits as required to identify the locations of pipes and conduits.
29. Where unsuitable foundation is encountered during construction of storm drains or sanitary sewers, the contractor shall remove the unsuitable material and replace it with other material approved by the supervising engineer.
30. Gravity storm drain pipes shall conform to ASTM D 3034 "Standard Specification for type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings" or approved equal (SDR35).
31. All corrugated plastic pipe (CPP) shall be HDPE, N-12 smooth interior pipe as manufactured by Advanced Drainage Systems, Inc. or Engineer approved equal and shall comply with ASSHTO M 294-94 Type S (smooth inner liner).
32. Bedding and backfill material shall conform to ASTM D2321 specification "standard recommended practice for underground installations of flexible thermoplastic sewer pipe (PVC)."
33. Processed aggregate shall be in accordance with the Town of Greenwich standards and/or Connecticut State Highway specifications.
34. Asphalt walks shall be 1 course bituminous concrete placed in accordance with the Town of Greenwich standards and/or Connecticut State Highway specifications.
35. Asphalt drives shall be 2 course bituminous concrete placed in accordance with the Town of Greenwich standards and/or Connecticut State Highway specifications.
36. All existing manhole frames, catch basin grates, and utility structures shall be adjusted to new finish grade as required. The Contractor shall coordinate with existing utility companies to ensure their facilities are adjusted to finish grade.

SEDTATION AND EROSION CONTROL NOTES

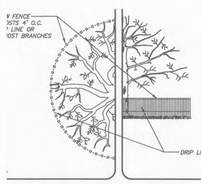
1. rary soil and erosion control measures inclusive of filter barriers, ı breaks, check dams, and anti-tracking areas shall remain in place ı long as necessary to permanently stabilize developed areas.
2. In and sediment control devices shall be installed in their proper nce. No clearing or grading may be done in any area until the as for that area, as shown on the plan, are in place and functional.
3. hl vegetation shall be maintained and protected to the greatest e practical.
4. dlment and erosion control devices and provisions shall be ntained in operational condition by the contractor until final acceptance e project.
5. langes of this soil erosion and sediment control plan may be made vt approval of the supervising engineer.
6. ldisturbance is to be kept to a minimum and reestablishment and/or zation of disturbed areas shall be scheduled as soon as practical.
7. In controls shall be monitored periodically to verify that they are ained in effective working order. If, during construction, additional el measures are necessary, they shall be installed.
8. lant or debris shall be removed from the drainage pipes and sures as it accumulates during construction. It shall be disposed a manner which is consistent with the intent of this plan.
9. lent fencing shall be installed where required prior to commencing uction and shall remain in place for the duration of the project. lg shall be Propex Silt Stop (TM) as manufactured by Amoco or ved equal.
10. ontractor may provide alternate means of sediment control, but he not eliminate placement of protection in the areas indicated areas ited hereon.
11. ontractor shall regrade, topsoil, and seed all disturbed areas diately after construction has been completed.
12. e of the Sedimentation and Erosion Control Plan are to be maintained e site and provided to the supervising engineer, project foreman, and ntractors prior to the start of work.
13. In controls shall remain in place until completion of the site uction process. Periodic monitoring will be required, particularly t and after periods of heavy rain.
14. onal protection measures shall be implemented as site conditions ıt.
15. ıditional 10% of trap rock, hay bales, snowfencing, fabric fencing, and ccontrol materials are to be stockpiled on site for use as necessary.
16. Ito Erosion and Sedimentation Control Handbook – Connecticut for onal details and specifications for sedimentation control.
17. rd drains shall be constructed with two (2) foot (minimum) deep s and traps.

SEDIMENTATION AND EROSION CONTROLS CONSTRUCTION STAGING

1. Inesedimentation and erosion controls.
2. Dsect existing utilities, where they exist.
3. Mnd cut trees to be removed.
4. Rs existing features as designated to bıoved.
5. Sopsoil for proposed fields, and drives wıpropriate sedimentation control measures.
6. Ete to subgrade for proposed fields, walks, arves. Place and grade subbase.
7. Inwater service, and utilities as required.
8. Re existing storm drains and install proposed stdrains.
9. Swerburden from Northeast corner of si
10. Oast and remove rock; process rock on si'ush and stockpile with appropriate S & E ca.
11. Cct retaining walls.
12. Inperimeter trench drain and site drains.
13. Cvct asphalt drives and walks.
14. Inprocessed aggregate subbase.
15. Indrain board.
16. InSynthetic Turf.
17. Infencing.
18. Flade and stabilize all slopes.
19. Lape.



MODULAR BLOCK WALL FENCE
N.T.S.



TREE PROTECTION
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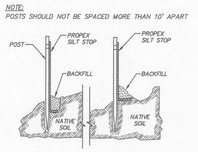

INSTALLATION DETAIL
SEDIMENT CONTROL FABRIC
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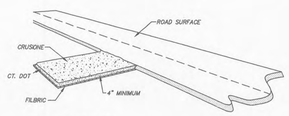

TRUCTION ENTRANCE

ANTI-TRACKING PAD DETAIL
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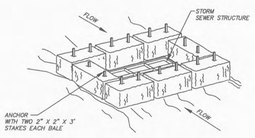
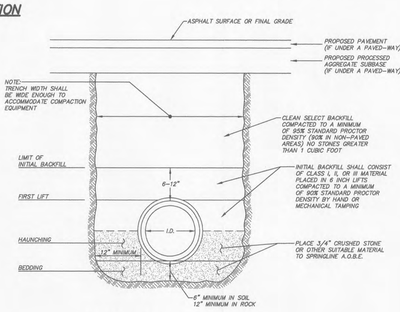
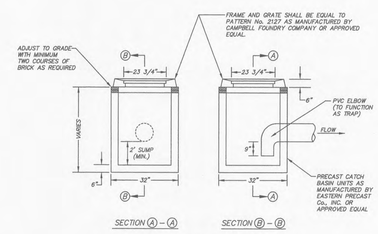


HAY BALE INSTALLATION
AT CATCH BASINS
N.T.S.

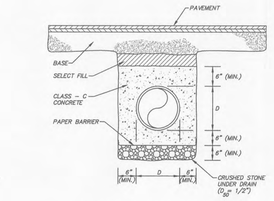


DETAIL FOR PVC AND CPP
STORM DRAIN INSTALLATION
N.T.S.

NOTE: REFER TO ASTM D2321 FOR TRENCHING PRACTICE AND BEDDING MATERIAL



YARD DRAIN DETAIL
TYPE "CL"
N.T.S.



CONCRETE CASING DETAIL
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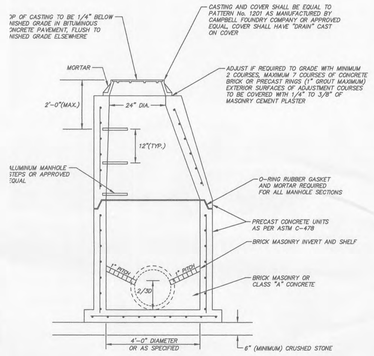

STORM DRAIN MANHOLE DETAIL
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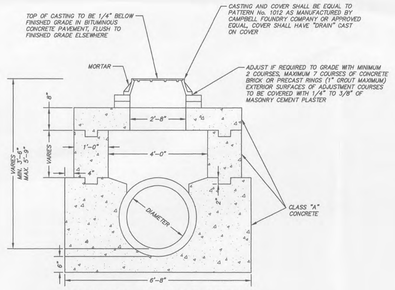

SHALLOW MANHOLE DETAIL
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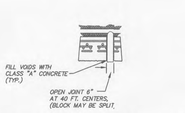
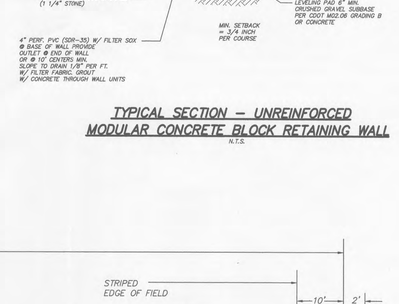
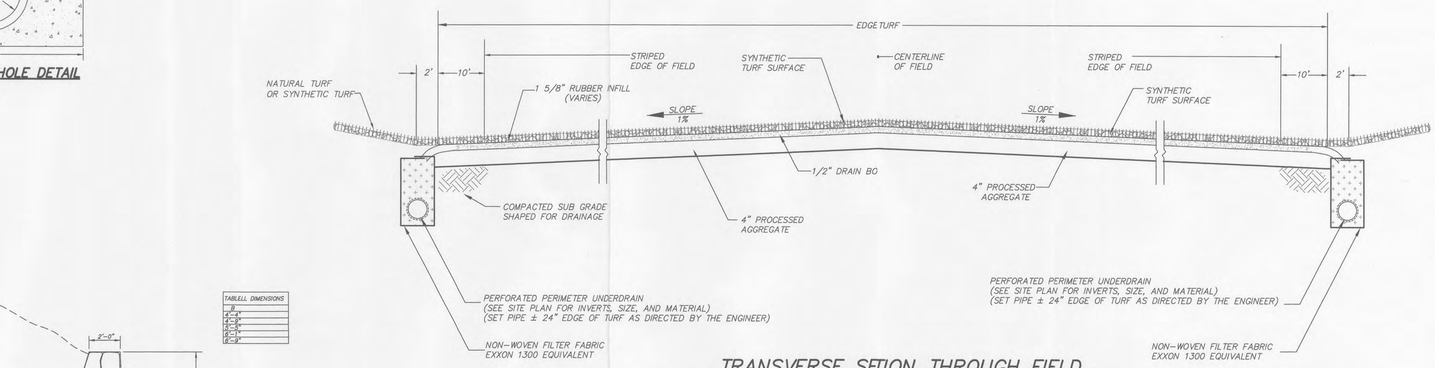


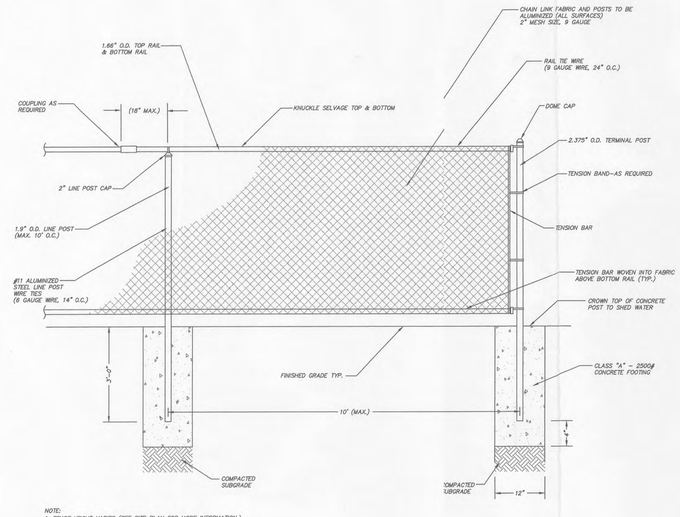
TYPICAL II'T
MODULAR CONCTE BLOCK
N.T.S.



TYPICAL SECTION - UNREINFORCED
MODULAR CONCRETE BLOCK RETAINING WALL
N.T.S.

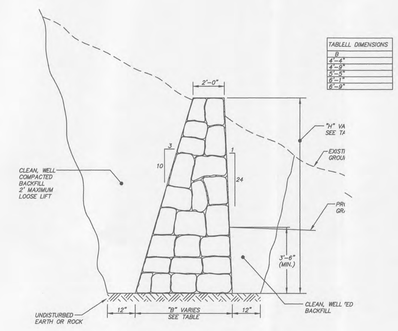


TRANSVERSE SETION THROUGH FIELD
N.T.S.

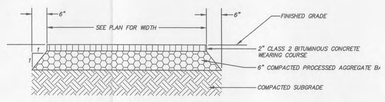


NOTE:
1. FENCE HEIGHT VARIES (SEE SITE PLAN FOR MORE INFORMATION.)
2. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR ALL FENCING GATES.

CHAIN LINK FENCE (4' & 6' h
N.T.S.



STONE RUBBLE RETAINING WALL
N.T.S.



BITUMINOUS CONCRETE WALKS
N.T.S.

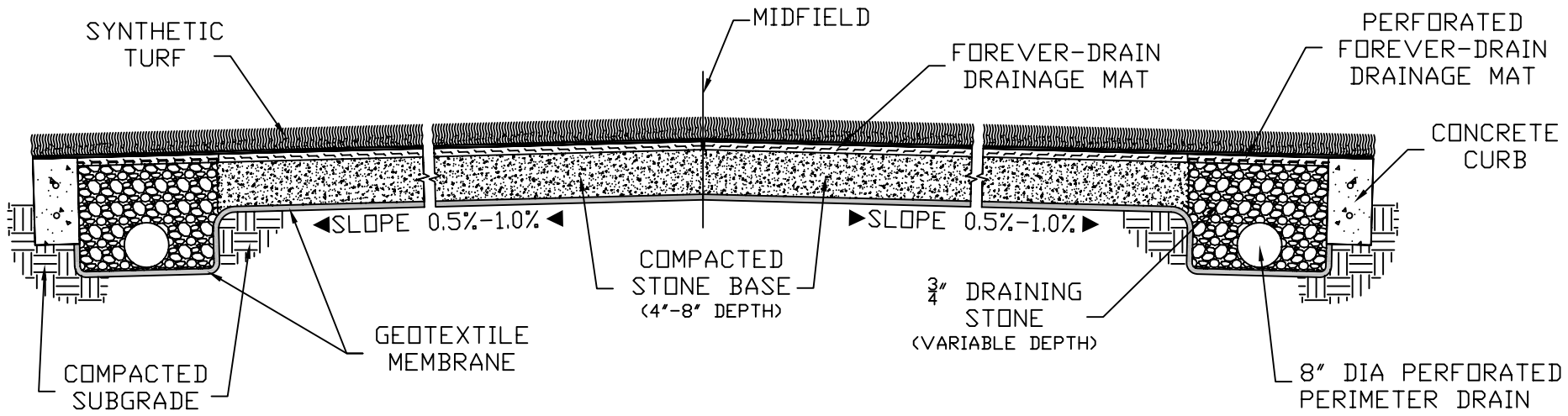
3	05-04-05	FIELD MODIFICATIONS
2	01-17-05	I.W.W.A. MODIFICATIONS
1	12-08-04	P. & Z. / I.W.W.A.
0	11-22-04	
REV.	DATE	DESCRIPTION

ANTHONY L. D'ANDREA, CT PE & LS No. 9673
05-04-05
ENGINEER & SURVEYOR — DATE

ONLY COPIES OF THIS PLAN BEARING AN ORIGINAL IMPRINT OF THE ENGINEER'S AND/OR SURVEYOR'S EMBOSSED SEAL ARE TRUE, VALID COPIES.

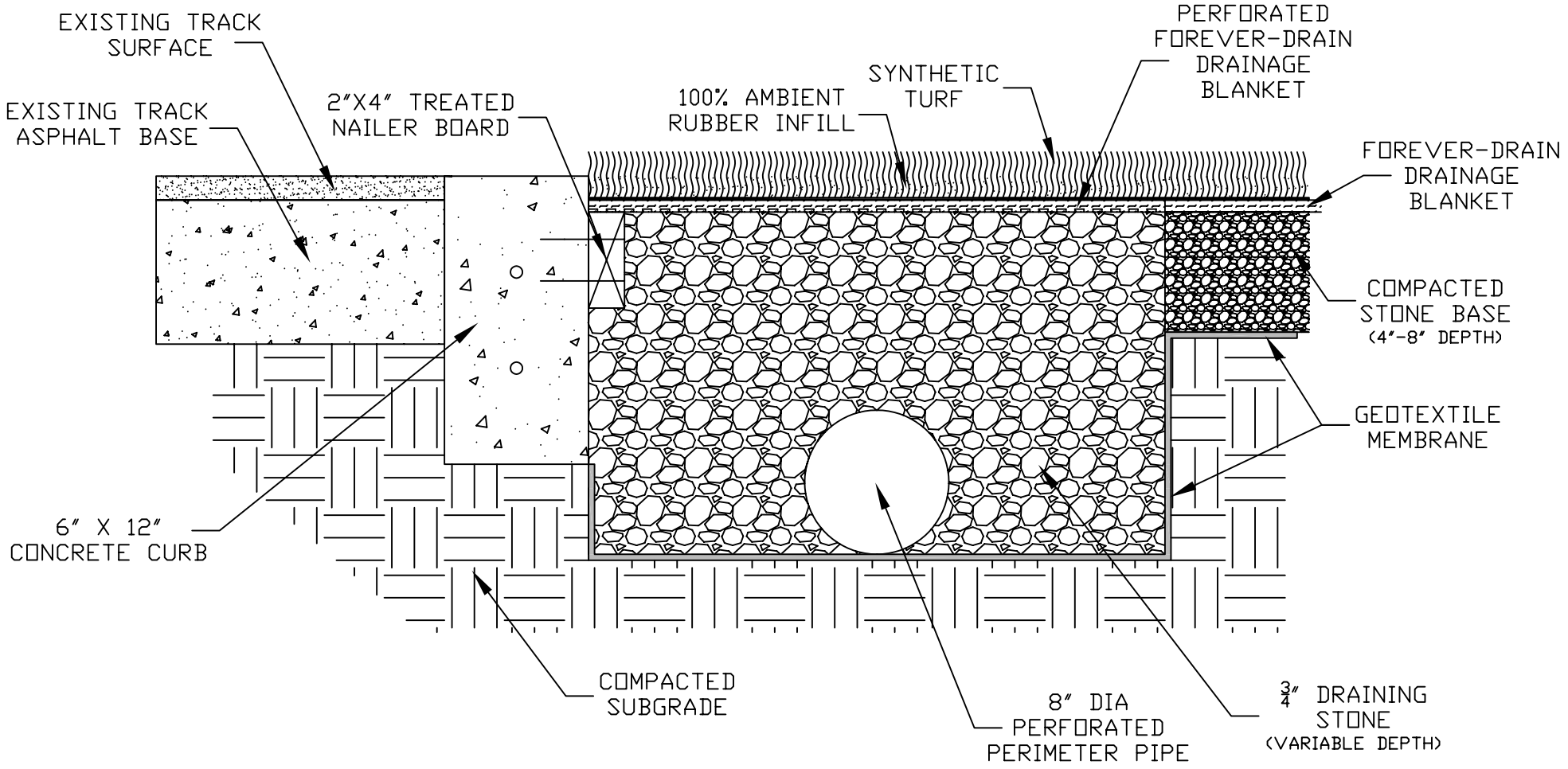
ROCCO V. D'ANDREA, INC.
• LAND PLANNERS
• ENGINEERS
• SURVEYORS
P.O. BOX 549, RIVERSIDE, CT 06878
6 NEIL LANE, TEL. 637-1779

PROJECT	ATHLETIC FIELD RECONSTRUCTION
PREPARED FOR	GREENWICH HIGH SCHOOL
LOCATION	10 HILLSIDE ROAD GREENWICH, CONNECTICUT
5 OF 6	NOTES AND DETAILS



TYPICAL TRANSVERSE DETAIL
FOREVER-DRAIN DRAINAGE MAT

FOREVER GREEN
ATHLETIC FIELDS INC.



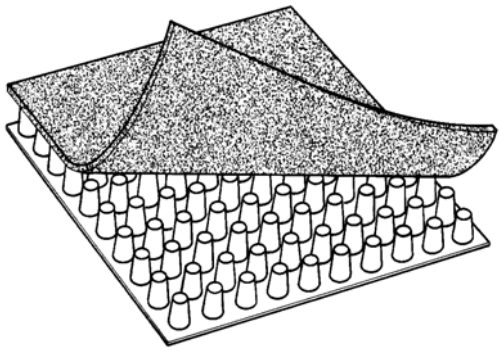
TYPICAL CURB TO EXISTING TRACK DETAIL #1 FOREVER-DRAIN DRAINAGE MAT

FOREVER GREEN ATHLETIC FIELDS INC.

ForeverDrain

Dynamic Drainage Blanket

ForeverDrain is a high compressive strength, moisture conducting, non-absorbent geocomposite drain made from recycled materials. ForeverDrain is a two-part pre-fabricated system that consists of a formed polystyrene core covered on both sides with a non-woven polypropylene filter fabric. The filter fabric allows water to pass freely into the core while restricting any movement of rubber or other particles that might clog the core. The core provides a high compressive strength structure that allows water to flow to designated exits. The use of ForeverDrain greatly reduces risk factors associated with poor subsurface soils. Installation provides an uninterrupted vertical-to-horizontal flow path for superior rainfall evacuation and enhanced G-max performance without changing the ball action or feel under-foot.



Patent No. 7,014,390

INSTALLATION:

ForeverDrain is available in 4' and 8' widths in custom designed lengths* based on field design as well as perforated and non-perforated underside. Each drain section terminates in the perimeter curtain drain. ForeverDrain can be connected by overlapping or taping the core flange.

* Maximum roll length 120'

Typical properties	US	SI	Test method
Fabric properties			
Material	Polypropylene	Polypropylene	
Grab tensile strength	110 lbs	485 N	ASTM D4632
Puncture strength65 lbs	285 N	ASTM D3787	
Trapezoidal tear	50 lbs	220 N	ASTM D4533
Mullen burst strength	215 psi	1430 kPa	ASTM D3786
Elongation	60%	60%	ASTM D4632
EOS (AOS)	70 sieve	212 micron	ASTM D4751
Permittivity	1.6 sec^{-1}	1.6 sec^{-1}	ASTM D4491
Permeability	0.01 ft/sec	0.3 cm/sec	ASTM D4491
Flow rate	150 gpm/ft^2	6110 lpm/m^2	ASTM D4491
Core properties			
Material	Polystyrene	Polystyrene	
Thickness	7/16 in	11 mm	
Comp. Strength	30,000 lbs/ft^2	1220 kN/m^2	ASTM D1621(Mod)
Flow cap / unit width	16 gpm/ft	200 lpm/m	ASTM D4716
per unit width			
Expansion Coefficient	4.42 $x10^{-5}$ in/in per˚C		

All information, drawings and specifications are based on the latest product information available at the time of printing. Constant improvement and engineering progress make it necessary that we reserve the right to make changes without notice. All physical properties are typical values. Standard variations in mechanical properties of 10% and in hydraulic properties of 20% are normal.

Forever Green Athletic Fields Inc.

1961 Hartel Street

Levittown, PA 19057

Office: (215) 547-1000 FAX: (215) 547-1500

Proposed Specifications

1.01 DESCRIPTION OF WORK SYNTHETIC GRASS BASE (02501)

A) Site Excavation
B) Excavation of a perimeter drainage collector network and installation of drainage grid system
C) Construction of a stable and permeable aggregate layer
D) Related Work
    1) Site Clearing
    2) Earthwork and Grading
    3) Drainage Facilities
    4) Synthetic Grass System
    5) Geotextile Membrane

1.02 Site Evaluation

A) Contractor shall inspect the removal of the existing organic material was sufficient to prepare for sub grade preparation per manufacturer's specification.

1.03 Submittals

A) Contractor shall submit sieve analysis of the rock courses specified to verify conformance to these specifications. Submittals shall include permeability testing as specified below, at compaction percentages specified.

1.04 Quality Assurance

Testing:

The permeability of the aggregate shall be checked by a registered geotechnical engineer from a sample of the aggregate sieve prior to shipping the rock to the site. In addition tests shall be coordinated to the client's representative to test the rock in 600 ton increments of shipping. The rock shall have a permeability rate no less than 6" per hour and shall be per Din 8035 Part 7, ASTM 2434 (constant head), or ASTM D3385 (double- ring) testing methods. In addition to the lab testing, after installation of any aggregate base cross-section, designed to conduct rainfall from the turf to the sub-soils and/or under-drain system. The finished aggregate base shall be tested, in situ for infiltration rate, using a double-ring infiltrometer (ASTM D-3385-94). The test shall be performed by a registered P.E or certified agronomists. The average 12 critical areas of the field, as determined by the client's representative. The average infiltration rate of all locations shall not be less than 6 "per hour, with no one location having a rate less that 4" per hour. The contractor is responsible to meet this performance specification, before proceeding with the installation of the synthetic turf, and shall bear the cost of the on-site testing and the cost of any additional work necessary to achieve compliance with the specification.

The entire test shall be logged and documented by the client's representative or geotechnical engineer. If at any time the processed stone base does not meet specifications, it shall be the Contractor's responsibility to restore at his expense, the processed stone base to the required grade, cross-section and density.

After the Contractor has independently confirmed compliance with all the above tolerances (planarity and elevation verified by a licensed surveyor and compaction, gradation, and permeability verified by Geotechnical Engineer), he shall notify the appropriate party and schedule a final inspection for approval. The Contractor shall make available an orbital laser system to the inspection team for the inspection process.

All testing fees shall be paid for by the Owner.

Part II Products

A) Liner: Shall be as specified in Section 02922- Geotextile Membrane
B) Flat Drains (Composite Drains): As specified in Section 02400- drainage Facilities

C) Permeable Base Rock: Shall be 100% fractured, by mechanical means, with elongated characters on each individual particle larger than ¼". Materials shall be devoid of mineral fines. All particles smaller than ¼" shall be produced by manufactured means only. Rounded sands or aggregates are prohibited.

D) Aggregate or Aggregate blends shall conform to the following gradation:

TOP 2"

SIEVE	SIEVE SIZES (mm)	% Passing by Weight (AASHTO T-27)
1/4"		95-100
No.4	4.75 mm	80-65
No.8	2.38 mm	65-40
No.30		15-30
No.50		15-20
No.100		5-9
No.200	75mm	2-6

CHOKING LAYER (intermediate) – 4"

½"		100
3/8"		90-95
¼"		80-90
No.4		75-85
No.8		55-80
No.30		35-55
No.50		25-50
No.80		10-25
No.100		5-10
No.200		0-5

BOTTOM 12"

1 ½"	38.1 mm	100
1"	25.4 mm	100
¾"	19.0 mm	95-100
½"	12.7 mm	80-90
3/8"	9.52 mm	50-70
No.4	4.75 mm	30-40
No.8	2.38 mm	20-30
No.40	.42 mm	5-17
No.200	75 mm	1-3

E) Collector trench rock shall be ¾" clean crushed drain rock

Part III EXECUTION

EXCAVATION

A) A single benchmark shall be established prior to any excavation and maintained by a licensed surveyor of record during the entire construction process. The site shall be excavated to sub grade depth as indicated on the plans and specified in Section 02200, Earthwork and Grading.

B) In the event of over excavation, select –fill material shall be used to achieve design sub grade elevations. Select materials shall be as specified in Section 02200, Earthwork and grading.

C) Proof roll and mark "soft spots" for additional compaction or correction. Use static tandem drum type roller of not less than five tons weight. Proof rolling operations shall be performed in the presence of the client's representative.

D) Excavate perimeter drainage collector trenches as shown on the plans. The trenches shall be excavated with the minimum of 0.5% slope starting from the low point of the drainage system at the outlet extending toward the high point(s). Design of the collector trenches shall incorporate the following:

1) All loose debris shall be removed from the trenches
2) The trenches shall be backfield using base materials specified in this Section

UNDER DRAIN SYSTEM

A) Membrane: Verify sub grade elevations of the finished sub grade. The elevations shall be conform to the elevations shown on Drawings
B) Prior to under drain system construction, the sub grade surface shall be uniform and free of rocks, depressions, voids, and irregularities.
C) Membrane: Install geotextile membrane to sub grade and collector trenches as specified in Section 02922- Geotextile Membrane.
D) Perimeter Collector Drains: Install perforated pipe in the perimeter collector trenches. The centerline of the pipe shall coincide with the centerline of the trench. The pipes shall be strong and capable of withstanding the anticipated loading without deformation.

    1) A minimum of 2" of the collector trench drain rock shall be placed in the bottom of the collector trenches, on top of the membrane. The crushed stone shall be compacted suitably.
    2) Fill the remainder of the collector trenches with the specified ¾ "drain rock to top of sub grade: compact suitably.

AGGREGATE LAYER

A) Install the permeable base over the entire sub base and the composite drain system. The aggregate shall comprise of a minimum 10" compacted, stable, permeable, processed, and stone. Care shall be taken to maintain the grade designed for the sub base. The capability of the processed stone drainage layer to meet the stability and permeability requirement shall be determined by a certified laboratory prior to construction of the course. The processed stone layer shall be compacted to a minimum density of 95%. Nuclear density tests shall be performed during the aggregate placement and rolling to ensure specified compaction.

PROPERTIES AND INSTALLATION OF PERMEABLE STONE

A) Delivery Moisture Content: Processed stone shall contain 90% to 110% of the optimum moisture content to ensure that fines do not migrate in transit or during placement and to facilitate proper compaction. This is critical. The contractor shall ensure that aggregate leaving the source plant meet this requirement. The contractor is required to apply water to the processed stone on site to attain and maintain this minimum moisture content. Stone base materials shall not be stockpiled on site. Stone base materials shall be 100% crushed.
B) Handling and Placement:

    1) Prior to aggregate placement, remove any excess or contaminated backfill from the drainage trenches.
    2) Should any separation of materials occur, during ant stage of the spreading or stockpiling, the contractor shall immediately remove and dispose of segregated material and correct or change handling procedures to prevent further separation. Double handling of materials shall not be allowed.
    3) The contractor shall utilize laser control equipment for the grading of the processed stone to ensure accuracy in the grade tolerances of 0' to 1/4"'
    4) Install processed stone based, from sideline toward center- line, parallel to the composite drain network, to the lines and grades shown on the drawings. Under no circumstances shall the material be pushed more than 30' from the point of discharge.
    5) The contractor shall shape the complete surface of the processed stone and continue until the deviation from the required elevation does not exceed a maximum deviation from grade of 0' to -1/4" in ten feet (10), when measured in any direction using a 10' straight edge.
    6) Each layer shall be spread uniformly with equipment that will not cause perceptible separation in gradation (segregation of the aggregate), preferably a self propelled paving machine or small laser controlled low ground pressure dozer (LPG).

C) Compaction and Planarity

    1) The processed stone shall be compacted to a minimum density of not less than 95% of the maximum density as determined by ASTM D698 and measured using a nuclear method.
    2) Proofs rolls wherever possible and mark "soft spots" for additional compaction or correction. Use static tandem drum type roller of not less than five (5) tons weight. Proof rolling operations shall be performed in the presence of the Engineer.

3) The finished surface shall not deviate (tolerance to grade) from the designated compacted grade. This means that the surface shall not deviate more than ¼" in 10' (any direction) when placed under a 10' straight edge. This tolerance is required over the entire field.

D) Areas that deviate shall be marked with spray paint and corrected with ¼" to 3/8" crushed stone or granite chips (limestone will not be accepted) and rolled tight to achieve proper density. Such remedial actions shall be done by hand and rechecked by means of test procedures described above.

E) TESTING

1) The surface of the processed stone course shall be well drained at all times. No standing water shall be permitted at any time. The permeability of the aggregate shall be checked per Din 8035 Part 7, ASTM 2434 (constant head), or ASTM D3385 (double ring) testing methods. Test samples shall be taken (at a minimum of) one sample per every 5,000 square feet or as otherwise approved by the Client's representative.
2) All test results will be logged and documented by the client's representative. If at any time the processed stone base does not meet specification, it shall be in the Contractor's responsibility to restore, at his expense, the processed stone to the required grade, cross section and density

END OF THIS SECTION

DIVISION 2 DRAINAGE MAT OR WAFFLE DRAIN OVER COMPACTED BASE COURSE

PART I GENERAL

DESCRIPTION OF WORK

A) Extent: It shall be the responsibility of Contractor to provide all labor, materials, equipment, and tools necessary for the complete installation of a vertical to horizontal drain mat system over a compacted Class II or equivalent State Department of Transportation road base specification.

1) Bring existing sub grade to proper line and grade. Sub-grade shall then be watered and compacted to 95% Standard Proctor Density. Moisture content shall be optimum at 12%.
2) Class II rock base, or State Department of Transportation equal, shall be brought in and spread over approved sub grade
3) Rough grade and compact rock base to a minimum depth of 4", or to the depth approved by State specifications. Base rock shall contain optimum moisture and shall be compacted to a minimum of 95% Standard Proctor Density.
4) Fine grade to specified tolerance
5) Install drainage mat over entire base and beyond, terminating in the trench drains

B) Related Work

1) Earthwork and Grading
2) Drainage Facilities
3) Synthetic Grass base
4) Synthetic Grass System
5) Synthetic Grass Warranty

QUALITY ASSURANCE

A) Installers of the Synthetic grass shall be required to comply with the following:

1) Prior experience on at least fifteen (15) of the base stabilization and drain mat installation. The designated supervisory personnel on the project shall be certified by the manufacturers of the products as competent in the installation of these materials. The Contractor shall ensure the presence of manufacturer's representative on site to certify that the installation meets their specifications and standards.

SUBMITTALS

A) Submit the following items before the start of on-site work:
1) A sample of the dynamic drainage mat system and perimeter drain
2) A list of prior artificial grass installations of similar types of installations with drain mat over compacted road base and specific contacts and phone numbers. Reference Paragraph Quality assurance herein.

PART II – PRODUCTS

MATERIALS

A) The vertical-to-horizontal drainage system shall be capable of evacuating a minimum of 2.5 in/hr of rainfall from the entire held area.
B) The dynamic drainage mat shall consist of either of the following:
    1) A high-density polyethylene (HDPE) cup sated core and a needle punched non-woven geo-textile on two sides. The installed mat shall be impermeable with sealed impermeable joints accomplished with factory-installed bonding medium allowed to expand and contract from the weather conditions by not warping or lifting up at jointed areas. The field edges or collector trenches shall be covered (as shown in the details on the plans) with a similar material but shall be punched a minimum of 4" o.c. to allow permeability to the collector drain rock below. Total weight of mat shall be a minimum of 32 oz. /sy and capable of accepting a compressive load of 25,000 psf, while maintaining measurable flow. Thickness of mat shall be a minimum of 0.5 inches. The drainage mat shall be delivered in min. 4' wide rolls. The rolls of drainage mat and turf shall be a minimum of 120' in length.
    2) Forever Drain, as available from Forever Green Athletic Fields, Inc. (215-628-9391) (www.foreverfields.com)
    3) Or approved equal one week prior to the bid.

C) The finished base course shall be laser graded to within ¼" in ten foot tolerance with a relative density of at least 95%
D) Drain Rock: As specified in Section 02501 – Synthetic Grass Base.

PART III – EXECUTION

BASE CONSTRUCTION

A) Specific design criteria shall include the following: Class II rock or State approved equal to a minimum depth of 8". The finish grade shall slope a minimum of ¾% (to a maximum of 1%) from the centerline of the field toward the sidelines, as shown on drawing.
B) Additional materials may be installed on the sub-base as is necessary to attain specified finished grade. Such materials shall be compactable enough to provide a stable grade for installation of the turf and fine enough to allow for specified grade tolerance, with a maximum stone size of 5/8". These additional materials shall be graded to ¼" in ten feet tolerance, and then compacted to 95%.

DYNAMIC DRAINAGE MAT INSTALLATION

A) Contractor shall use an electronic or staked grade grid, of not more than 25' separation, to establish finished grade of Class II base, before installing the drain mat.
B) Impermeable mat shall be installed across full width of the field and butt up to the permeable mat over the collector trenches. Install the permeable mat across the nailer and directly over perimeter sub-drain collector pipe. Care shall be taken to insure that all seams are as tight as possible, leaving no gaps for irregularities that could reflect through the synthetic grass surface. The drainage mat shall be temporarily held in place by stapling or nailing to the field to allow for the installation of the synthetic grass.
C) Timing of drain mat installation shall coincide with synthetic grass installation. No more than 20 yards of field coverage shall be installed prior to installing carpet.

END OF THIS SECTION

DIVISION 2 - SYNTHETIC GRASS SYSTEM (02535)
Part 1

DESCRIPTION OF WORK

1) The work under this section includes but is not limited to the installation of the geotextile membrane, new synthetic grass system, in fill materials, in laid markings, perimeter termination and maintenance equipment.

A) The Contractor shall supply and deliver an extra 2000 lbs of specified TPE (Thermoplastic Cross linked Polyethylene Foam) resilient non-rubber in fill material as specified for the field.

B) The Contractor shall supply an additional 200 linear feet of nylon or Mylar seaming tape (18" width), in addition, Supply and deliver two additional 5 gallon pails of glue (34G) as manufactured by Synthetic Surfaces of Scotch Plains, NJ, SportsTurf Adhesive (two part) or equal.

C) Contractor shall supply at the end of the project one Parker Sweeper, or equal. The unit shall be tow type having a width of 4 feet.

D) The cost for the extra materials for the project as outlined above shall be addded in the total cost of this contract for the project.

E) The Contractor shall supply at the end of the project one new and unused Greens Groomer brush, or equal, unit. This unit will be a 6 foot width for the brushes. In lieu of the "Greens Groomer" a "Go Groomer Go" brush (800-728-3581) model G-7, or equal, may be substituted.

F) The Contractor has the option to install the Synthetic Grass System as the Method A installation or Method B installation. Method A installation shall include the Synthetic Grass Carpet on the base rock with the field drains and geotextile fabric. Method B installation shall include the Synthetic Grass Carpet installed over the drainage mat installed over a compacted stone base.

G) Related Work:

1) Earthwork and Grading
2) Drainage Facilities
3) Synthetic Grass Base
4) Synthetic Grass System
5) Geotextile Mat
6) Geotextile Membrane

SUBMITTALS

A) Installer Qualifications: Within 1 day after the Notice to Proceed, submit proof of installer's experience on at least 15 installations (materials and processes) in the last 3 years. The synthetic grass manufacturer shall certify the designated supervisory personnel on the project. A letter on the manufacturer's letterhead shall be submitted affirming the sub/contracting as competent in the installation of the material, including seaming methods, in laid markings, termination and proper installation of the product.

B) Synthetic Grass Sample: Within 14 days of the Notice to Proceed, the Contactor shall submit an 18 inch square sample of the synthetic grass and in fill system proposed for this contract for approval of colors, in fill, seaming materials and layout of the system. The sample shall be reviewed as the product intended for the use on the field.

C) Warranty:

1) Within 14 calendar days from the Notice to Proceed, the Contractor shall submit a warranty per section 02537, Synthetic Grass Warranty and Guarantee.
2) The Contractor is required under this guarantee to supply and install all in fill materials and synthetic grass to maintain the performance levels of this guarantee.

D) Testing and Quality Control: Prior to shipping the synthetic grass to the project site, the contractor shall submit to the client's representative a copy of the results certified by an independent testing laboratory for the following test performed on the synthetic grass to be installed in the project:

Pile Yarn Type	**Slit Film 100% Polyethylene Fiber (Parallel Fibrillation Pattern)**
Yarn Denier	ASTM D 1577
Yarn Breaking Strength	ASTM D 2256
Yarn Melting Point	ASTM D 789
Pile Height/Weight	ASTM D 418

Total Weight	ASTM D 418
Backing Performance	ASTM D 418
Tuft Bind (with and with out infill)	ASTM D 1335
Grab Tear Strength	ASTM D 1682
Impact Attenuation	ASTM D 335
Pile Burn Test	ASTM D 2859

E) Maintenance and Operating Data: Submit to the client's representative a copy of maintenance and operating data for the synthetic grass system. Provide descriptions of all equipment recommended for the maintenance, repair, citing grass and activities not recommended relative to the warranty. Include maintenance recommendations including coverings and special events, small repair procedures, minor seam repair, discussion of the precautions to be practiced, general maintenance and uses to avoid to protect the grass system.

F) Site Acceptance: As apart of this contract, this contractor shall be responsible to oversee the installation of the base and Drainage and to comment on any problems or conflicts that may be discovered. Upon completion of the base work, submit a letter confirming the site inspection has been performed, noting any discrepancies, problems and/or conflicts. A summary of certification of the acceptance of the base and drainage shall be submitted.

G) Submit a seaming diagram, including the layout of the grass panels and seam locations, within 14 days following Notice to proceed.

H) Submit a synthetic grass sample of the end zone letter colors within 14 days following Notice to proceed.

STANDARD SPCIFICATIONS FOR LAYOUT AND RULES

A) All markings and layout shall conform to the requirements set for the by the City.

B) All markings shall be performed using selected colors of grass materials

FIELD SLOPE

A) The field shall be installed with a minimum 0.75% slope as shown on plans. This will be maintained throughout. Any modification to this slope shall be submitted in advance to the client's representative for final review and approval.

DELIVERY, STORAGE, AND HANDLING

A) Packing and Shipping: Deliver products in original unopened packaging with legible manufacturer's identification. All materials shall be stored in a dry place out of direct sunlight.

B) Bulk Materials: Deliver materials in clean, washed and covered trucks to eliminate contamination during transportation. On site stockpiling locations to be coordinated with the client's representative. Stockpile only in areas clear of debris and away from drainage routes. Cover all materials with plastic or geotextile if materials are to be stockpiled more than 48 hours.

FIELD DIMENSIONS AND LAYOUT

A) The Contractor shall be responsible for furnishing, setting and marking all lines, seams and markings for the field. The Contractor shall at all times maintain all necessary benchmarks and control points to locate all events and markings.

PROTECTION OF UTILITIES AND STRUCTURES

A) This Contractor shall take special care to protect all field stadium structure and utilities

Part II MATERIALS

GENERAL

A) The field surfacing system shall be a vertically draining permeable synthetic grass system consisting of a synthetic grass like pile that shall be tufted into a triple layer synthetic backing. The final coating shall be a polyurethane based material.

B) The Synthetic Grass Systems are:

1) Forever Green Athletic Fields, Fort Washington, PA (215-874-5750 or E-mail KDAY@FOREVERFIELDS.COM)

2) Or approved equal one week prior to date of bid.

C) The entire system shall be resistant to weather, insects, rot, mildew, fungus growth and be non allergenic and non toxic. The entire system shall be constructed to maximize dimensional stability, to resist damage and normal wear and tear from its designated uses and to minimize the ultra violet degradation.

D) All adhesives used in bonding the system together shall be resistant to moisture, bacteria and fungus attacks, and resistant to ultra violet rays at any location upon installation.

E) Include all labor, materials, equipment, transportation and services to install complete all weather synthetic grass system.

F) Any other submittal will need approval one week prior to bid; Contractor must adhere to all submittal specifications.

DYNAMIC CUSHONING REQUIREMENTS OF THE SYNTHETIC GRASS SYSTEM

A) The dynamic cushioning of the combined grass and in fill system (pad if required) shall not exceed a maximum of 115 G's at 70 degrees per ASTM 1936-98, F355, procedure A at any location within 30 days of the installation. The system shall not exceed 150 G's over the warranty period. Any testing below 85 G's shall not be allowed.

B) Packing and Shipping: Deliver products in original unopened packaging with legible manufacturer's identification. All materials shall be stored in a dry place out of the direct sunlight.

1) TPE (Thermoplastic Cross linked Polyethylene Foam) resilient non-rubber in fill material as specified for the field., or approved equal. The material shall have a size not to exceed 14 mesh nor smaller than 20 mesh. The fine particles shall not exceed 10% by volume. Granulated SBR Rubber ist acceptable. There shall be no silica sand..

C) The in fill system shall have not less than 3.75 pounds per square foot installed and shall consist of a minimum of 75% of the

fiber height as the infill. Any system that requires less rubber in fill shall be required to use an in situ shock pad system as a force reduction vehicle. The pad shall be designed and tested by the contractor to show compliance with the shock attenuation requirements.

C) Approved TPE (Thermoplastic Cross linked Polyethylene Foam) resilient non-rubber in fill material:

1) Smartfill by Forever Green Athletic Fields, Inc. 215-874-5750
2) Or approved Equal

PERMEABLE REQUIREMENTS OF THE SYNTHETIC GRASS SYSTEM

A) After the sub grade is compacted and before the stone base and stone screenings leveling course is fine graded, compacted and made ready for the grass, the Geotextile Membrane, Section 02922 (filter type fabric) shall be installed under the stone base for Method A installation only.

B) The combined and grass in fill system (if pad required) shall drain vertically at a minimum of 4 inches per hour of precipitation per hour for 24 hours continuously, without visible surface ponding.

ADHESIVE MATERIAL PROPERTIES

A) Adhesive material to adhere the synthetic grass shall be a polyurethane 34G or 34 s-3 adhesive as manufactured by Synthetic Surfaces Inc of Scotch Plains, NJ, SportsTurf Adhesive(two part system) or equal. The adhesive shall be applied at a rate not to exceed 75 square feet per gallon.

B) The adhesive shall have the same warranty period as the synthetic grass system.

C) 34 S shall only be applied with an airless sprayer. 34 G shall not be mixed, stirred or thinned in any way.

SYNTHETIC GRASS PILE SURFACE

A) The pile surface shall provide good traction in all types of weather with the use of conventional "sneaker type shoes" and composition, molded sole athletic shoes. The pile surface shall be suitable for both temporary and permanent line. Markings and permanent markings using rubber base paint where applicable.

SYNTHETIC GRASS SYSTEM MATERIAL COMPNENTS

A) Pile fibers shall resemble freshly grown natural grass in appearance, texture and color (except for the color grass for markings).

B) Fibers shall be XPS, a parallel pattern slit film 100% polyethylene fiber having a denier of not less than 10,000 with a film thickness of not less than 100 microns. Total fiber weight shall not be less than 50 ounce per square yard.

C) Pile surface shall be uniform in length not less than 2 ¼" for Method A installation and 2" for Method B installation.

D) The fibers are tufted through a triple layer (three separate layers) combination of woven and or non woven as the Synthetic backing material. Action backs shall have no more than a ¼ "mesh.

E) The final coating or secondary backing shall have moisture cure polyurethane. This backing shall be not less than 20 ounces. Latex backing material is not acceptable. The secondary backing or polyurethane coating shall be uniform and monolithic when cured.

F) If sewn, all grass seams shall be constructed of reinforced backing material or sewn with high strength polyester fiber cord. Sewn seams shall be a "bagger" type seam with a double sewn line. Seams shall lay flat after in fill.

G) All glued seams shall have a 12" wide seaming tape of nylon or Mylar, fully coated with adhesive. All seams shall

not have any adhesive applied to any exposed fibers. All graphics or markings can be in laid or cut in.

H) All grass shall be perforated for drainage after final backing coating. The perforations shall be not less than 3/8" in diameter and have a uniform spacing of 3 X 4". Perforations shall be complete and full diameter for a minimum of 95% of each roll.

I) On site perforations are to be inspected prior to installation of the product.

J) Fabric surface shall be constructed and installed in minimum widths of 15 feet with no longitudinal or transverse seams, except for inlaid lines with a finished roll assembly. Each panel shall be delivered for installation across the full width (perpendicular to the playing direction) of the field. Sidelines may be installed lengthwise of the field. Butt and head seams shall not be allowed within the field of play. The seams shall be 15'-0" apart. Rolls that do not comply with the proper length or conform to the seaming diagram as submitted prior to installation, shall be rejected from the site. No fitted pieces shall be allowed to true alignment.

PERFORMANCE AND TEST REQUIREMENTS

A) References to Method A or B are as needed only. All requirements apply to both Methods of installation.

1) Melting point	ASTM D 789	135 degrees F
2) Specific Gravity	ASTM D 792	.950to .960
3) Breaking Strength	ASTM D 5034	length 283 lbs/ft width 208 lbs /ft
4) Coefficient of friction	ASTM D 5034	dry 1, 15 wet 1.00
5) Pill Burn test	ASTM D 2859	8 passed/ 0 failed
6) Tuft bind (with out)	ASTM D 1335	8 lbs/sq ft
Tuft bind (with infill)	ASTM D 1335	12lbs/sq ft
7) Pile height	ASTM D 418	2-1/4" min method A, 2 "method B
8) Fiber face weight	ASTM D 418	50 oz/sq yd min
9) Fiber Construction	ASTM D 418	100% polyethylene slit film, Parallel pattern, not less 100 microns in thickness
10) Fiber Gauge Width	ASTM D 418	.375" between tufted rows
11) Fiber Denier	ASTM D 418	8,000 denier min
12) Fiber Thickness	ASTM D 418	100 microns
13) Fiber Manufacturers	Thiolon	
14) Secondary Backing	ASTM D 418	oven cured polyurethane
15) Secondary backing	ASTM D 418	20 ounce of finished weight per sq yd
16) Perforations	visual	3" X 4" spaced on center max
17) Fiber Manufacturer		Thiolon USA

MARKINGS

A) A complete field lining, marking and field boundary system with team areas limits, etc, shall be provided with the initial installation. Layouts shall be accurately and marked prior to installation.

B) All lines, numbers and field markings except one yard marks are to be tufted or inlaid with the specific colored turf. All markings shall be uniform in color, providing a sharp contrast with the turf color and shall have and distinct edging. Markings shall be true and shall not vary more than ½" from specified width and location.

C) Submit manufacturer's guarantee that the synthetic fiber is acceptable to painted lines.

D) Minimum lining and markings

1) Soccer Field: NHSCA
2) Football Field: NCAA

TERMINATION NAILER

A) The nailer shall be "Trex" OR EQUAL 2" X 6"

Part III EXECUTION

INSTALLATION

A) Perform all work in strict accordance to the drawings, shop drawings and manufacturer's specifications and instructions.

B) Verification: The Contractor is responsible for the inspection, verifying and completing all installed work for this section.

C) Weather Permitting Conditions: The contractor will not perform any work if the conditions for working are:

1) Ambient air temp are below 45 degrees F

2) Material temps fall below 45 degrees F
3) Rain is forecasted or falling
4) Conditions exist or are pending that will be unsuitable to the installation of the system

CERTIFICATION OF THE BASE INSTALLATION

A) The Contractor is responsibility for the review and acceptance of the base and drainage

B) Upon completion of the base, in either method A or method B installation, Contractor shall submit in written form the acceptance of the base noting any deficiencies, continuing with the installation of the synthetic grass (without a written acceptance submittal from the contractor) over the base shall be considered as an approval of the base by the Contractor.

DELIVERY OF INSPECTION OF MATERIALS

A) Prior to the installation of any materials and immediately upon delivery of the synthetic grass system and components To the project site, The Contractor shall inspect materials as follows:

1) For damage or defective items
2) Measure grass pile height and roll lengths
3) Inspect the performance and uniformity
4) Adhesives should arrive in closed containers
5) TPE (Thermoplastic Cross linked Polyethylene Foam) resilient non-rubber in fill material shall arrive in large sacks or bags without tears and loose materials about
6) TPE (Thermoplastic Cross linked Polyethylene Foam) resilient non-rubber in fill material shall arrive dry and loose. No rubber shall be accepted that is bulked or solid
7) TPE (Thermoplastic Cross linked Polyethylene Foam) resilient non-rubber in fill material shall be free of exposed metal particles
8) SmartFill Granulated SBR resilient -rubber in fill material shall arrive in large sacks or bags without tears and loose materials about

TESTING

A) The client reserve the right to submit any material, either before or after installation to any testing it deems necessary to satisfy the conditions of this contract.

B) Any material tested and found not in compliance with this contract will be rejected and replaced with material conforming to the specifications. This will be done at the sole expense of the Contractor.

C) Any testing performed by the client will be at the clients' expense. The Contractor is responsible for the cost of the testing for failures. Contractor will bear cost of retesting as required by client.

TERMINATION NAILER

A) The nailer shall be installed to the concrete curbing with 3" nails from a nail gun two feet on center. Each end of the nailer (2' x 6") shall be secured with a 3/8 " diameter x 3 " long molly bolt. Core drill into curb and tighten bolt to nailer,

GRASS INSTALLATION

A) Method A installation only

1) Any turf material in method A installation only with less than the 20 oz. secondary backing shall have a 12 oz non woven geotextile membrane installed under the synthetic grass. The synthetic grass shall be staged and unrolled as necessary for a daily installation. No material will be allowed to be unrolled 24 hours prior to installation.
2) If a shock pad is required for method A installation only. The in situ pad can be installed over the accepted base. Control of the finish grade and contour shall be the responsibility of the contractor. The use of a pre manufactured pad will be acceptable.

B) SEAMS

1) All panel seams shall be securely sewn using a double stitch bagger seam and /or glued to a backing material
2) All panel seams spacing are to be held to a min 15 feet unless prior approval of seaming diagram indicates a lesser panel.
3) All inlaid areas shall have full fastenings and no loose areas. At no time can pulling on the section separate the material.

4) All seams and inlaid areas shall be brushed thoroughly before infill materials are installed.

C) GRASS EDGES AND TERMINATION

1) All edges and ends of the grass shall be secured to a termination area. This termination shall be as detailed in the drawing and as specified herein.

LINES, MARKINGS AND INLAID GRASS

A) All markings and lines shall be inlaid using the accepted color grass.
B) All lines and markings shall be accurately set and surveyed to within ½" tolerance.
C) All lines and meetings shall be installed prior to any installation of in fill material

INSTALLATION OF RESILIENT IN FILL

A) All in fill materials shall be c TPE (Thermoplastic Cross linked Polyethylene Foam) resilient non-rubber in fill material, or approved equal. If other methods of production of the TPE (Thermoplastic Cross linked Polyethylene Foam) resilient non-rubber in fill material are used the granules shall have a bulk density of 29.75 lbs per cubic foot.
B) The in fill Material shall be installed at not less than 5 pounds per square foot for Method A installation and 3.75 pounds per square foot for method B installation.
C) No in fill materials shall be installed until the grass system is fully installed with all lines and markings.
D) The synthetic grass shall be thoroughly brushed prior to any in fill materials to remove any wrinkles and deffrillate and slit film.
E) The in fill materials shall be installed in layers not to exceed 0.30 pounds per square foot per layer.
F) The grass shall remain free draining at all times before; during and after the infill materials are installed.

GENERAL CLEAN UP

A) The site shall be kept clean and free of debris throughout the installation. Empty barrels, sacks, bags, and remnant materials shall be stored or disposed daily in a proper container or legal manner.
B) After completion of the entire project, the site shall have a general cleanup removing all debris remaining on the site that is not apart of the final project.
C) All natural grass areas disturbed during this construction shall be restored to the satisfaction of the City Representative at no additional cost to the City.

END OF THIS SECTION

PART I – GENERAL

WARRANTY OF SYNTHETIC GRASS SYSTEM

A) The Warranty/Guarantee shall cover, in general, the usability of the grass system (and pad if required): accessories use characteristics and suitability of the installation. All items covered by the warranty are to be replaced or repaired with new materials, including installation at the sole expense of the warranting manufacturer/surface supplier for a minimum period of eight (8) years to the City from the date of final acceptance of the work and final payment. The field materials shall be guaranteed for the designated uses as follows:

1) Soccer
2) Football
3) Physical Education exercises
4) Physical Education activities
5) Pneumatic rubber tired maintenance and service equipment
6) Pedestrian traffic and other similar uses

B) A principal of the applicable firm, duly authorized to make contracts, shall sign the grass contractor warranty. The term "Contractor" contained herein shall mean the firm that is furnishing warranty. If the grass manufacturer of the synthetic grass system is not the same entity as the Contractor, the warranty shall be co-signed by the manufacturer and the installation contractor.
C) Contractor shall submit and Guarantee form specified in section 01740, with the below information attached and signed.

FORM OF WARRANTY OF THE SYNTHETIC GRASS SYSTEM

A) Contractor hereby warrants to the City, subject to the limitations and conditions set forth below, that its synthetic grass system consisting of the synthetic grass described as _____, the shock-absorbing under-pad (if necessary) described as _____, and the adhesives used in the installation, are free from defects in material and workmanship and shall, for minimum period eight (8) years from the date of acceptance by the City, remains serviceable for the activities as listed above.

B) Contractor warrants to the City that its synthetic grass materials shall not fade, fail, shrink, wrinkle or reflect excessive wear. Contractor shall, at their sole expense and cost, replace such areas of the synthetic grass system not performing to these standards for the life of the warranty.

C) Definitions:

1) The term "not fade" in the context of this warranty shall mean that the synthetic grass material remain a uniform shade of green or the other colors installed with no significant loss of color as defined as not greater by 20% loss or shade reduction.

2) The term "not fail" or "excessive wear" are used in the context of this warranty shall mean that the length and weight of the face yarn or pile material in the synthetic grass surface shall not have been decreased by more than 8% per year according to ASTM D418, nor exceed 30% during the warranty period. In the event that the synthetic grass materials do not retain its fiber height or shock absorbency and is consequently no longer serviceable during the warranty period, the Contractor shall, at their sole expense, replace such portions of the system that are no longer serviceable.

3) The term "serviceable" in the context of this warranty shall mean that the synthetic grass material shall have a maximum "G" force value according to Procedure A, B, or C of ASTM D355, not exceed 115 G's at any location upon installation and shall not exceed 150 G's thereafter throughout the life of the warranty period. This shall be determined by conducting dynamic cushioning tests at the six field locations as required per ASTM D355 procedures. "G" force factor values to be determined at 70 degrees F. Any increase from 115 G's to allowable 150 G's maximum shall be at a relatively uniform rate not to exceed 10 G's in any single year. Individual "G" testing below 85 G's shall not be allowed in the total averaging of the G-max testing. Prior to any G-max testing on the field, the testing machine shall be calibrated in the field with a test past to verify accuracy of the testing unit. Calibration and testing shall be witnessed by the City or City's representative. The Contractor is required to perform the necessary testing during a scheduled time at least one time per year during the guarantee period. The results of the testing shall be submitted to the City within 30 days of each test. Failure to submit the results shall serve as notice to perform such testing by City to determine the extent of the needs under this guarantee.

D) Where applicable, the fabric shall adhere firmly and completely to the under pad or seaming tape over the entire warranty period.

E) Contractor warrants to the City that the permeable synthetic grass system shall drain vertically a minimum of 4 inches precipitation per hour for a maximum of 24 hours continuously, without visible surface ponding.

F) Contractor shall replace with new materials, at their sole expense, any damage to the synthetic grass system, which extends more than one meter beyond the location of foreign combustibles, which may ignite, and fire-damage the synthetic grass system. The Contractor shall not be held responsible for any incidental or consequential damages. These warranties and the Contractor's obligations hereunder are expressly conditioned upon:

1) The City making all minor repairs to the synthetic grass system upon the discovery of the need for such repairs.

2) The City maintaining and properly caring for the synthetic grass system in accordance with the Contractor's maintenance manual and instructions.

3) The City complying with the dynamic and static load specifications established by the Contractor.

G) The warranty is not to cover any defect, failure, damage, or undue wear in or to the synthetic grass system caused by or connected with abuse, neglect, deliberate acts, acts of God, casualty, static, or dynamic loads exceeding Contractor's recommendations.

QUALITY ASSURANCE

A) The Client's Representative will notify the contractor in writing of any issues that require remedial work on the field area.

B) The Contractor shall respond to the notification within 72 hours of receipt and schedule any major defect or repair within 10 days or as weather permits.

C) The warranty requires that the Contractor shall be required to perform all required repairs in a permanent and suitable manor as deemed necessary to maintain a safe playing condition at all times.

D) The warranty requires that in case of any major repair or replacement the Contractor is to schedule such work as to not interfere with the client's primary use of schedule.

E) Any replacement or repair area shall match (as close as possible) the appearance of the existing grass.

F) Failure to service the requirements of this warranty will be charged to the Contractor.
G) Any defects caused by delaminating, peeling, normal abrasion, or raveling that is not in the original conformance with the testing specifications shall be repaired or replaced at no cost to the Client during this guaranteed period.
H) The Contractor shall be required to submit the following documents in the regard to the guarantee:

1) Provide a minimum eight (8) year prorated surfacing manufacturer/installer written guarantee for the synthetic grass.
2) Documents shall be submitted to the Client prior to final payment.

I) The Contractor will be responsible for all tests that fail the specification. The Client reserves the right to submit the surface to the above test at any time during the length of the guarantee. Consideration will be given to the time and use of the surface.
J) This warranty does not cover excessive wear caused to the surface caused by misuse. The Client will be given instructions and care-taking procedures before final acceptance. The Client is to follow the maintenance guidelines as specified by the surfacing manufacturer.

END OF SECTION

Artificial Turf Field Materials – Photo Log

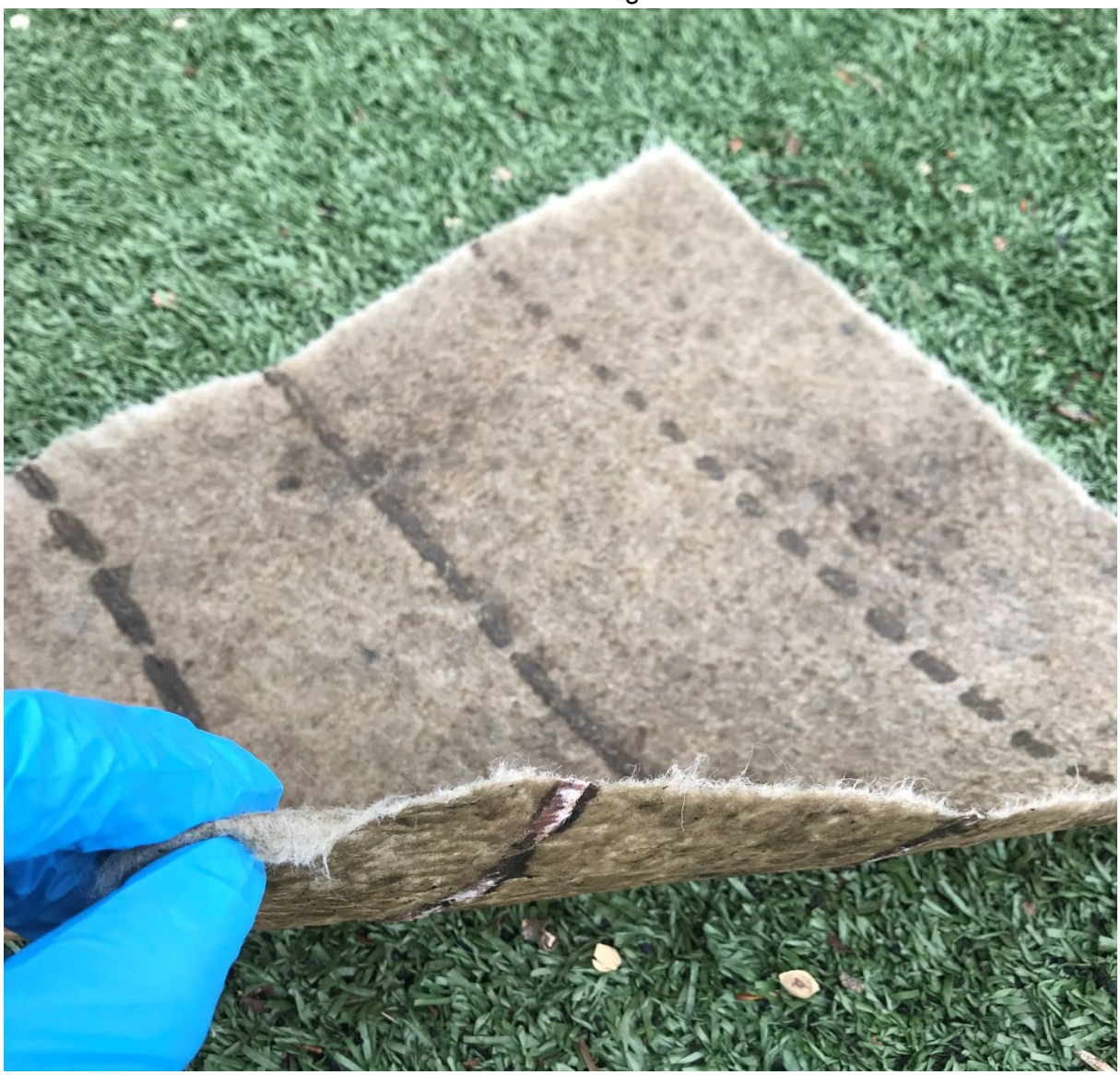
Material: Synthetic Grass Turf – Pile Fibers



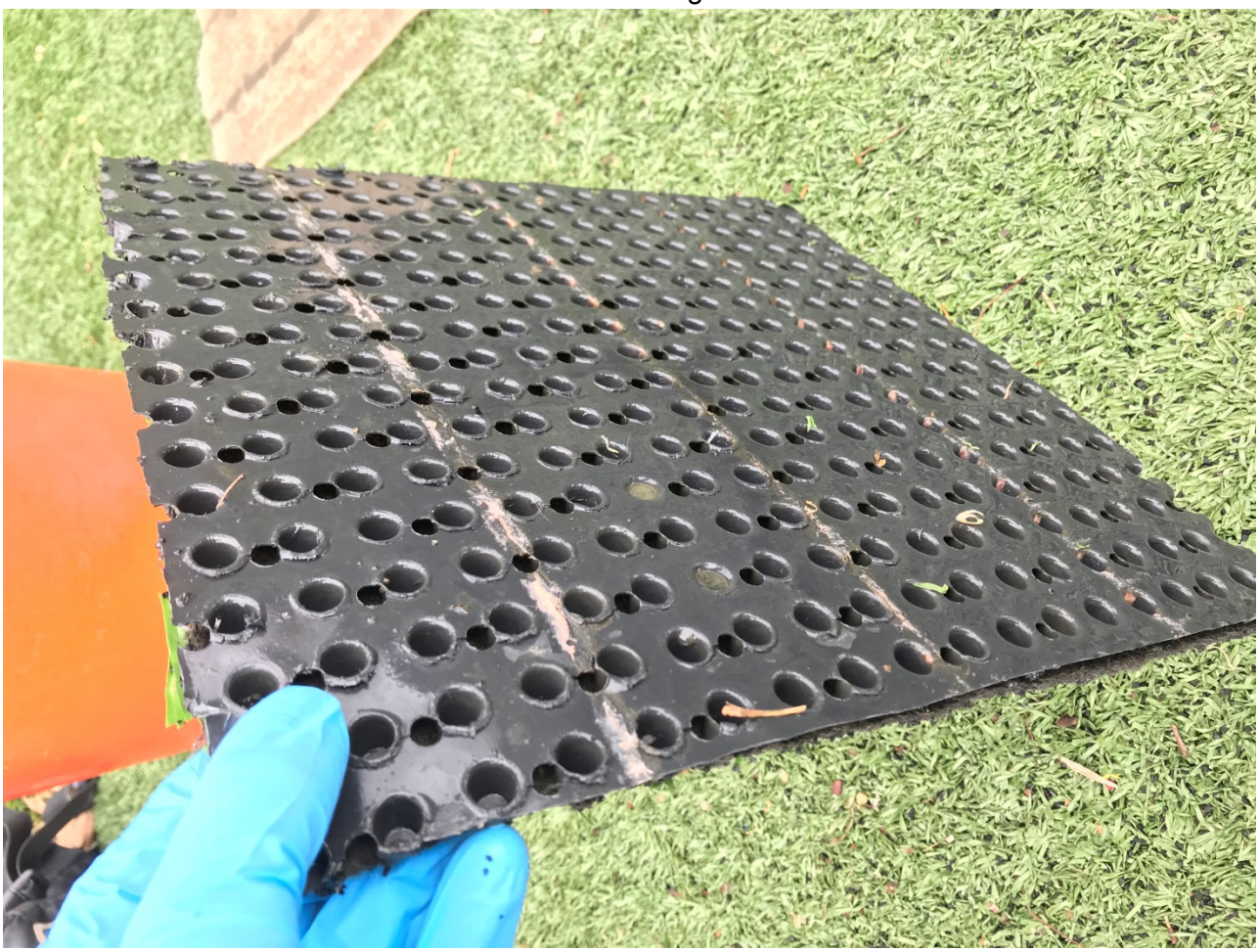
Material: Crumb Rubber Infill



Material: *ForeverDrain* Drainage Blanket - Fabric



Material: *ForeverDrain* Drainage Blanket – Core



Material: Compacted Stone Base



Letter Reports

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Rocky Hill, CT 06067
aecom.com

June 11, 2018

Mr. Jeff Wilcox
Remediation Division Bureau of Water
Protection and Land Reuse
Connecticut Department of Energy and
Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Turf Sampling Data Summary
Greenwich High School
10 Hillside Road
Greenwich, Connecticut
Remediation ID No. 13334

Dear Mr. Wilcox

On behalf of the Town of Greenwich (Town) Department of Public Works (DPW), and at the request of the Connecticut Department of Energy and Environmental Protection (CTDEEP) and United States Environmental Protection Agency (EPA) (collectively, the Agencies), AECOM collected samples of the synthetic turf materials and associated drainage and construction layers in Fields 3 and 4 at Greenwich High School. Samples were collected at six locations on the two fields. Locations were selected to be within the limits of the synthetic turf field, but outside the limits of the playing area to minimize disturbance to the turf and potential safety risks. Sampling locations are shown on the attached figure.

The sampling program included collection of 5 materials associated with the synthetic turf at each sample location. The materials sampled included:

1. Grass carpet (A layer);
2. Crumb rubber infill material (B layer);
3. Polystyrene drainage blanket (C layer);
4. Cushion (D layer); and
5. Structural stone fill (E layer).

(Sample identifiers provide the sample location and the layer – e.g., AA12-D is the cushion layer from sample location AA12.)

The results of the sampling program are summarized in the attached table. Thirty samples of the synthetic turf and associated construction materials were collected and analyzed for PCBs. PCBs were detected in six of the samples analyzed including, one grass carpet sample (A layer), two crumb rubber samples (B layer), and three stone fill samples (E layer). Three of the samples where PCBs were detected had concentrations of PCBs greater than 1 milligram per kilogram (mg/kg) including one crumb rubber infill sample and two stone fill samples. AECOM has reviewed the analytical data set for completeness and usability and has qualified the data accordingly. The data were determined to be usable, as reported, although several quantities were identified as estimated values, based on the quantification and variability in duplicate analyses for one sample. The Data Quality Assessment performed on the data set is included as **Attachment A**. Laboratory analytical reports are included as **Attachment B**.

AECOM reviewed the surficial turf (A and B layer) sampling data with respect to potential risks to human health. The previously completed site-wide Human Health Risk Assessment was used as a guide to evaluating the turf data. The

findings of the risk assessment show that there is no unacceptable health risk / hazard associated with exposure to PCBs detected in the surficial turf sample (A and B layers). Therefore, the fields remain safe for use. The risk assessment is included as **Attachment C**.

Based on the results of the turf sampling program, the Town and AECOM would like to engage in a discussion with the Agencies to determine a path forward. We will follow up with you as well as with Kim Tisa and Gary Trombly this week.

Regards,

Patrick Haskell, LEP, CHMM
Technical Leader

Michael Doherty, P.E.
Associate Vice President

Attachments:

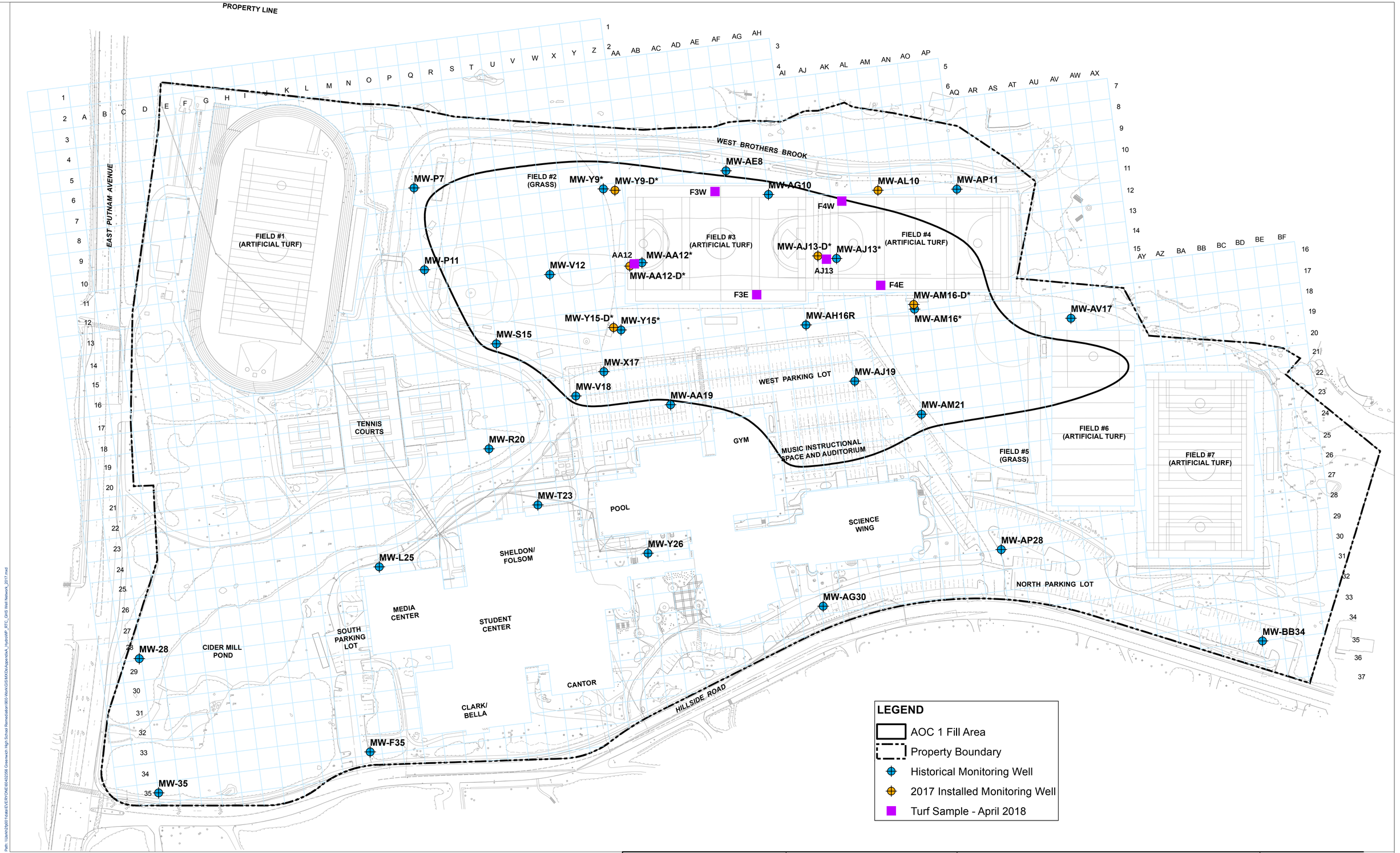
Figure: Turf Sampling Locations

Table: Data Summary Table

Attachment A – Data Quality Assessment
Attachment B - Laboratory Analytical Reports
Attachment C – Human Health Risk Assessment

cc:
Amy Siebert, Town of Greenwich, Department of Public Works
Daniel Watson, Greenwich Public Schools
Kim Tisa, EPA
Gary Trombly, CTDEEP
Jane Warren, McCarter & English, LLP

Figure



SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
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AECOM

N

SCALE:
1" = 80'
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 1
TURF SAMPLING LOCATIONS - APRIL 2018

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

JOB 60225155
FILE NO.
CAD FILE
SHEET

Table

Table 1
Summary of Field Turf Sampling Results
Field #3 and Field #4
Greenwich High School
Greenwich, Connecticut

		Sample Identifier, Sampling Date, Lab Deliverable #, and Result														
Analyte	Units	AJ13-A 4/19/2018 18D0844	AJ13-B 4/19/2018 18D0844	AJ13-C 4/19/2018 18D0844	AJ13-D 4/19/2018 18D0844	AJ13-E 4/19/2018 18D0844	F3E-A 4/19/2018 18D0844	F3E-B 4/19/2018 18D0844	F3E-C 4/19/2018 18D0844	F3E-D 4/19/2018 18D0844	F3E-E 4/19/2018 18D0844	F4E-A 4/19/2018 18D0844	F4E-B 4/19/2018 18D0844	F4E-C 4/19/2018 18D0844	F4E-D 4/19/2018 18D0844	F4E-E 4/19/2018 18D0844
Percent Solids	%	78.1	85.7	64.8	27.4	89.2	69.1	85.7	69.8	31.7	89.9	71.6	87.4	62.6	35.9	90.9
PCBs By SW8082A																
Aroclor 1016	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1221	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1232	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1242	mg/Kg	0.77 J	2.6 J	<0.62	<1.82	8.5	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1248	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	0.26	<0.56	0.38	<0.62	<1.20	<0.085
Aroclor 1254	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1260	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1262	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1268	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Total PCBs	mg/Kg	0.77 J	2.6 J	ND	ND	8.5	ND	ND	ND	ND	0.26	ND	0.38	ND	ND	ND

Notes:
Detections presented in bold text.
mg/kg = Milligrams per kilogram.
<0.46 = Analyte not detected at a concentration greater than given laboratory reporting limit.
Lab report gives results for layers A, D, and E as wet weight. Calculated dry weight results are provided above.
AJ13-A = Sample from Turf Layer A - Grass carpet
AJ13-B = Sample from Turf Layer B - Crumb rubber infill
AJ13-C = Sample from Turf Layer C - Polystyrene drainage blanket
AJ13-D = Sample from Turf Layer D - Cushion
AJ13-E = Sample from Turf Layer E - Structural stone fill

Table 1
Summary of Field Turf Sampling Results
Field #3 and Field #4
Greenwich High School
Greenwich, Connecticut

		Sample Identifier, Sampling Date, Lab Deliverable #, and Result														
Analyte	Units	F3W-A 4/19/2018 18D0844	F3W-B 4/19/2018 18D0844	F3W-C 4/19/2018 18D0844	F3W-D 4/19/2018 18D0844	F3W-E 4/19/2018 18D0844	AA12-A 4/19/2018 18D0847	AA12-B 4/19/2018 18D0847	AA12-C 4/19/2018 18D0847	AA12-D 4/19/2018 18D0847	AA12-E 4/19/2018 18D0847	F4W-A 4/19/2018 18D0847	F4W-B 4/19/2018 18D0847	F4W-C 4/19/2018 18D0847	F4W-D 4/19/2018 18D0847	F4W-E 4/19/2018 18D0847
Percent Solids	%	69.1	83.5	66.4	31.9	89.6	74.9	86.5	64.1	30.3	91.3	64.3	77.6	66.2	35.1	90.3
PCBs By SW8082A																
Aroclor 1016	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1221	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1232	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1242	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1248	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	1.9 JN	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1254	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1260	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1262	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1268	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Total PCBs	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9 JN	ND	ND	ND	ND	ND

Notes:
Detections presented in bold text.
mg/kg = Milligrams per kilogram.
<0.46 = Analyte not detected at a concentration greater than given laboratory reporting limit.
Lab report gives results for layers A, D, and E as wet weight. Calculated dry weight results are provided above.
AJ13-A = Sample from Turf Layer A - Grass carpet
AJ13-B = Sample from Turf Layer B - Crumb rubber infill
AJ13-C = Sample from Turf Layer C - Polystyrene drainage blanket
AJ13-D = Sample from Turf Layer D - Cushion
AJ13-E = Sample from Turf Layer E - Structural stone fill

Attachment A – Data Quality Assessment

AECOM
250 Apollo Drive
Chelmsford, MA 01824

978.905.2100 tel
978.905.2101 fax

Data Validation Report

Project:	Greenwich High School, Greenwich, CT
Laboratory:	Con-test Analytical, Inc.
Service Request:	18D0844 and 18D0847
Analyses/Method:	Polychlorinated Biphenyls (PCBs) by Gas Chromatography (GC)/SW-846 8082A
Validation Level:	Limited Review
AECOM Project Number:	60432356.0800.2-Turf field
Prepared by:	Paula DiMattei/AECOM
Completed on:	05/10/2018
Reviewed by:	Lori Herberich/AECOM
File Name:	18D0844_18D0847 Limited DV_pld

SUMMARY

AECOM performed a data quality assessment for the samples listed below which were collected from the Greenwich High School site in Greenwich, CT on April 18, 2018.

Sample ID	Matrix/Sample Type	Analysis (Method)
AJ13-A	Solid Product	PCBs (SW-846 8082A)
AJ13-B	Solid Product	
AJ13-C	Solid Product	
AJ13-D	Solid Product	
AJ13-E	Soil	
F3E-A	Solid Product	
F3E-B	Solid Product	
F3E-C	Solid Product	
F3E-D	Solid Product	
F3E-E	Soil	
F4E-A	Solid Product	
F4E-B	Solid Product	
F4E-C	Solid Product	
F4E-D	Solid Product	
F4E-E	Soil	
F3W-A	Solid Product	
F3W-B	Solid Product	
F3W-C	Solid Product	
F3W-D	Solid Product	
F3W-E	Soil	
AA12-A	Solid Product	
AA12-B	Solid Product	

Sample ID	Matrix/Sample Type	Analysis (Method)
AA12-C	Solid Product	
AA12-D	Solid Product	
AA12-E	Soil	
F4W-A	Solid Product	
F4W-B	Solid Product	
F4W-C	Solid Product	
F4W-D	Solid Product	
F4W-E	Soil	

A review of the Quality Control (QC) summary forms (required hardcopy deliverables) was performed to identify issues with data quality that would require qualification of specific data points. The laboratory case narrative was also reviewed and was relied upon to completely and accurately narrate all QC nonconformances, including those for QC checks that are not required hardcopy deliverables. This review was performed with reference to the Connecticut Department of Energy and Environmental Protection (CTDEEP) document *Laboratory Quality Assurance and Quality Control Guidance, Reasonable Confidence Protocols Guidance Document*, November 2007 and revised December 2010; *CTDEP Laboratory Quality Assurance and Quality Control, Data Quality Assessment and Data Usability Evaluation Guidance Document*, May 2009 and revised December 2010; and the applicable recommended Reasonable Confidence Protocols (RCPs). EPA Region I Data Validation Guidelines (April 2013) were used as a reference for applying validation actions, as applicable.

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

✓	Holding times and sample preservation
✓	Initial calibration/initial and continuing calibration verifications
✓	Laboratory blanks/equipment blanks
✓	Surrogate spike recoveries
✓	Matrix spike (MS)/matrix duplicate (MD) and/or matrix spike duplicate (MSD) results
✓	Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
NA	Field duplicate results
✗	Sample results/reporting issues

The symbol (✓) indicates that no results were qualified based on this parameter. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a quality control (QC) nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Select data points were qualified as estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Holding Times and Sample Preservation

Sample preservation requirements and preparation/analysis holding times were met.

Initial Calibration/Initial and Continuing Calibration Verifications

There were no nonconformances narrated concerning the initial calibration and initial and continuing calibration verifications performed for this data set.

Laboratory Blanks/Equipment Blanks

Target compounds were not detected in the laboratory method blanks associated with the samples in this data set. Equipment blanks were not submitted with this data set.

Surrogate Spike Recoveries

The surrogate percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met or qualification of the data was not required.

Matrix Spike (MS)/Matrix Duplicate (MD) and/or Matrix Spike Duplicate (MSD) Results

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met or qualification of the data was not required.

Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and RPDs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate Results

Field duplicate samples were not submitted with this data set. No data validation actions were taken on this basis.

Sample Results/Reporting Issues

Chromatograms and overlays were requested to review the strength of pattern match between reference Aroclors and a selected sample. Overlays for sample AA12-E (18D0847-05) with reference Aroclors 1242 and 1248 indicated relatively poor pattern match between sample peak relative abundance and the standards. This is corroborated by the high RSDs (73% and 56%, respectively) between the 4 selected peaks for quantitation on the front and back columns. The front to back RPD for the average reported results is 34%, which although below the 40% criteria of RCP guidance, indicates some quantitative issues. Results for this sample were therefore qualified as presumptively present but estimated (JN flagged) based on this review.

The results for the non-soil artificial turf components were reported on an “as is” basis with the following exception. The samples with the suffix-B in the sample identifier, which represent the crumb-rubber infill component of the artificial turf, were reported on a dry weight basis. The soil samples were likewise reported on a dry weight basis. The laboratory was asked to perform dry weight analysis on the remaining artificial turf components, and those results were reported.

AECOM therefore calculated corrected PCB concentrations on a dry weight basis and is summarizing them in external reports.

The laboratory noted that there was insufficient sample to perform a percent solids determination for sample AJ13-B. Consequently, the laboratory used the percent solids result from sample F3E-B (the median percent solids result of the other B-layer samples) to report sample AJ13-B on a dry weight basis. The positive and nondetect results for all Aroclors in sample AJ13B were qualified as estimated (J/UJ) since an alternate sample was used to correct for percent solids content.

The percent solids data were reviewed to ensure that Region 1 specified criteria were met. All percent solids criteria were met.

Dilutions were performed on all samples due to the presence of matrix interferences.

Sample results were reviewed to ensure that the dual column precision RPD criteria were met. The <40%RPD precision criterion was exceeded for the Aroclor 1242 results for samples AJ13-A and AJ13-B. These results were qualified as estimated (J).

It should be noted that all project action limits may not have been met for all target compounds. As part of the data quality assessment, review elements which may impact sensitivity (i.e., laboratory and field blanks or sample dilutions) have been reviewed and are summarized, if applicable. Sample results have not been compared to any project action limits as part of this data quality/usability assessment process. The corrected dry weight laboratory reporting limit for the artificial turf cushion layer (indicated by the suffix "-D" in the sample ID) are greater than 1 mg/kg.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. Validation actions were performed with reference to EPA Region I guidelines, unless otherwise noted above.

ATTACHMENTS

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	QL	Units	Validation Qualifiers	Validation Reason
AA12-E-041818	SO	Aroclor 1248	1.9	0.43	mg/kg	JN	q
AJ13-A-041818	SO	Aroclor 1242	0.77	0.36	mg/kg	J	r
AJ13-B-041818	SO	Aroclor 1260		0.46	mg/kg	UJ	q
AJ13-B-041818	SO	Aroclor 1254		0.46	mg/kg	UJ	q
AJ13-B-041818	SO	Aroclor 1268		0.46	mg/kg	UJ	q
AJ13-B-041818	SO	Aroclor 1016		0.46	mg/kg	UJ	q
AJ13-B-041818	SO	Aroclor 1262		0.46	mg/kg	UJ	q
AJ13-B-041818	SO	Aroclor 1221		0.46	mg/kg	UJ	q
AJ13-B-041818	SO	Aroclor 1232		0.46	mg/kg	UJ	q
AJ13-B-041818	SO	Aroclor 1248		0.46	mg/kg	UJ	q
AJ13-B-041818	SO	Aroclor 1242	2.6	0.46	mg/kg	J	r,q

Attachment A

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample and the numerical value has a high bias.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample and the numerical value has a low bias.
JN	The analyte was tentatively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment B

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
bt	Trip blank contamination
c	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column precision
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

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Attachment B – Laboratory Analytical Reports

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

May 25, 2018

Matthew Rood
AECOM Environment - Rocky Hill, CT
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067

Project Location: Greenwich, CT
Client Job Number:
Project Number: 60432356
Laboratory Work Order Number: 18D0844

Enclosed are results of analyses for samples received by the laboratory on April 19, 2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Aaron L. Benoit
Project Manager

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AECOM Environment - Rocky Hill, CT
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067
ATTN: Matthew Rood

REPORT DATE: 5/25/2018

PURCHASE ORDER NUMBER: 99513ACM

PROJECT NUMBER: 60432356

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 18D0844

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Greenwich, CT

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
AJ13-A	18D0844-01	Soil		SM 2540G	
				SW-846 8082A	
AJ13-B	18D0844-02	Soil		SM 2540G	
				SW-846 8082A	
AJ13-C	18D0844-03	Soil		SM 2540G	
				SW-846 8082A	
AJ13-D	18D0844-04	Soil		SM 2540G	
				SW-846 8082A	
AJ13-E	18D0844-05	Soil		SM 2540G	
				SW-846 8082A	
F3E-A	18D0844-06	Soil		SM 2540G	
				SW-846 8082A	
F3E-B	18D0844-07	Soil		SM 2540G	
				SW-846 8082A	
F3E-C	18D0844-08	Soil		SM 2540G	
				SW-846 8082A	
F3E-D	18D0844-09	Soil		SM 2540G	
				SW-846 8082A	
F3E-E	18D0844-10	Soil		SM 2540G	
				SW-846 8082A	
F4E-A	18D0844-11	Soil		SM 2540G	
				SW-846 8082A	
F4E-B	18D0844-12	Soil		SM 2540G	
				SW-846 8082A	
F4E-C	18D0844-13	Soil		SM 2540G	
				SW-846 8082A	
F4E-D	18D0844-14	Soil		SM 2540G	
				SW-846 8082A	
F4E-E	18D0844-15	Soil		SM 2540G	
				SW-846 8082A	
F3W-A	18D0844-16	Soil		SM 2540G	
				SW-846 8082A	
F3W-B	18D0844-17	Soil		SM 2540G	
				SW-846 8082A	
F3W-C	18D0844-18	Soil		SM 2540G	
				SW-846 8082A	
F3W-D	18D0844-19	Soil		SM 2540G	
				SW-846 8082A	
F3W-E	18D0844-20	Soil		SM 2540G	
				SW-846 8082A	

con-test® ANALYTICAL LABORATORY

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

REVISED REPORT 05/25/2018: Report revised to have all results reported as dry weight per client e-mail request on 5/23/2018.

% Solids for 18D0844-07 used to perfom % Solids for dry weight calulationfor 18D0844-02. No sample volume remaing for 18D0844-02 fopr % Solids.

SW-846 8082A

Qualifications:

DL-03

Elevated reporting limit due to matrix.

Analyte & Samples(s) Qualified:

18D0844-03[AJ13-C], 18D0844-04[AJ13-D], 18D0844-06[F3E-A], 18D0844-08[F3E-C], 18D0844-09[F3E-D], 18D0844-11[F4E-A], 18D0844-13[F4E-C], 18D0844-14[F4E-D], 18D0844-16[F3W-A], 18D0844-18[F3W-C], 18D0844-19[F3W-D]

MS-21

Matrix spike and/or spike duplicate recovery bias high due to contribution of other Aroclors present in the source sample.

Analyte & Samples(s) Qualified:

Aroclor-1016
B201398-MS1, B201398-MSD1, B201451-MS1, B201451-MSD1

Aroclor-1016 [2C]
B201398-MS1, B201398-MSD1, B201451-MS1, B201451-MSD1

Aroclor-1260
B201398-MS1, B201398-MSD1

Aroclor-1260 [2C]
B201398-MS1, B201398-MSD1

P-01

Result was confirmed using a dissimilar column. Relative percent difference between the two results was >40%. In accordance with the method, the higher result was reported.

Analyte & Samples(s) Qualified:

Aroclor-1242 [2C]
18D0844-02[AJ13-B]

P-02

Sample RPD between primary and confirmatory analysis exceeded 40%. Per EPA method 8000, the lower value was reported due to obvious chromatographic interference on the column with the higher result.

Analyte & Samples(s) Qualified:

Aroclor-1242 [2C]
18D0844-01[AJ13-A]

S-01

The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

Analyte & Samples(s) Qualified:

Decachlorobiphenyl
18D0844-05[AJ13-E]

Decachlorobiphenyl [2C]
18D0844-05[AJ13-E]

Tetrachloro-m-xylene
18D0844-05[AJ13-E]

Tetrachloro-m-xylene [2C]
18D0844-05[AJ13-E]

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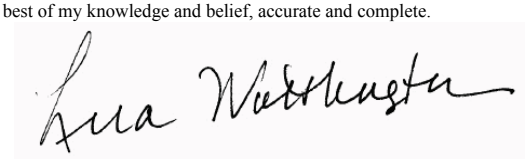
The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Project Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: AJ13-A | Sampled: 4/18/2018 10:15

Sample ID: 18D0844-01

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.36	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:17	PJG
Aroclor-1221 [1]	ND	0.36	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:17	PJG
Aroclor-1232 [1]	ND	0.36	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:17	PJG
Aroclor-1242 [2]	0.60	0.36	mg/Kg	5	P-02	SW-846 8082A	4/20/18	5/1/18 16:17	PJG
Aroclor-1248 [1]	ND	0.36	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:17	PJG
Aroclor-1254 [1]	ND	0.36	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:17	PJG
Aroclor-1260 [1]	ND	0.36	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:17	PJG
Aroclor-1262 [1]	ND	0.36	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:17	PJG
Aroclor-1268 [1]	ND	0.36	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:17	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	74.6	30-150		5/1/18 16:17
Decachlorobiphenyl [2]	77.5	30-150		5/1/18 16:17
Tetrachloro-m-xylene [1]	92.3	30-150		5/1/18 16:17
Tetrachloro-m-xylene [2]	95.1	30-150		5/1/18 16:17

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: AJ13-A | Sampled: 4/18/2018 10:15

Sample ID: 18D0844-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	78.1		% Wt	1		SM 2540G	5/24/18	5/24/18 14:44	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: AJ13-B | Sampled: 4/18/2018 10:20

Sample ID: 18D0844-02

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.46	mg/Kg dry	20		SW-846 8082A	4/20/18	4/24/18 17:11	KAL
Aroclor-1221 [1]	ND	0.46	mg/Kg dry	20		SW-846 8082A	4/20/18	4/24/18 17:11	KAL
Aroclor-1232 [1]	ND	0.46	mg/Kg dry	20		SW-846 8082A	4/20/18	4/24/18 17:11	KAL
Aroclor-1242 [2]	2.6	0.46	mg/Kg dry	20	P-01	SW-846 8082A	4/20/18	4/24/18 17:11	KAL
Aroclor-1248 [1]	ND	0.46	mg/Kg dry	20		SW-846 8082A	4/20/18	4/24/18 17:11	KAL
Aroclor-1254 [1]	ND	0.46	mg/Kg dry	20		SW-846 8082A	4/20/18	4/24/18 17:11	KAL
Aroclor-1260 [1]	ND	0.46	mg/Kg dry	20		SW-846 8082A	4/20/18	4/24/18 17:11	KAL
Aroclor-1262 [1]	ND	0.46	mg/Kg dry	20		SW-846 8082A	4/20/18	4/24/18 17:11	KAL
Aroclor-1268 [1]	ND	0.46	mg/Kg dry	20		SW-846 8082A	4/20/18	4/24/18 17:11	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	85.3	30-150		4/24/18 17:11
Decachlorobiphenyl [2]	76.4	30-150		4/24/18 17:11
Tetrachloro-m-xylene [1]	83.2	30-150		4/24/18 17:11
Tetrachloro-m-xylene [2]	91.7	30-150		4/24/18 17:11

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: AJ13-B | Sampled: 4/18/2018 10:20

Sample ID: 18D0844-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.7		% Wt	1		SM 2540G	4/20/18	5/3/18 14:30	FWD

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: AJ13-C | Sampled: 4/18/2018 10:20

Sample ID: 18D0844-03

Sample Matrix: Soil

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:35	PJG
Aroclor-1221 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:35	PJG
Aroclor-1232 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:35	PJG
Aroclor-1242 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:35	PJG
Aroclor-1248 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:35	PJG
Aroclor-1254 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:35	PJG
Aroclor-1260 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:35	PJG
Aroclor-1262 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:35	PJG
Aroclor-1268 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:35	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	67.5	30-150		5/1/18 16:35
Decachlorobiphenyl [2]	67.4	30-150		5/1/18 16:35
Tetrachloro-m-xylene [1]	79.8	30-150		5/1/18 16:35
Tetrachloro-m-xylene [2]	81.3	30-150		5/1/18 16:35

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: AJ13-C | Sampled: 4/18/2018 10:20

Sample ID: 18D0844-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	64.8		% Wt	1		SM 2540G	5/24/18	5/24/18 14:45	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: AJ13-D | Sampled: 4/18/2018 10:25

Sample ID: 18D0844-04

Sample Matrix: Soil

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:53	PJG
Aroclor-1221 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:53	PJG
Aroclor-1232 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:53	PJG
Aroclor-1242 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:53	PJG
Aroclor-1248 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:53	PJG
Aroclor-1254 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:53	PJG
Aroclor-1260 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:53	PJG
Aroclor-1262 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:53	PJG
Aroclor-1268 [1]	ND	0.50	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 16:53	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	91.2	30-150		5/1/18 16:53
Decachlorobiphenyl [2]	95.0	30-150		5/1/18 16:53
Tetrachloro-m-xylene [1]	96.4	30-150		5/1/18 16:53
Tetrachloro-m-xylene [2]	99.5	30-150		5/1/18 16:53

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: AJ13-D | Sampled: 4/18/2018 10:25

Sample ID: 18D0844-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	27.4		% Wt	1		SM 2540G	5/24/18	5/24/18 14:45	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: AJ13-E | Sampled: 4/18/2018 10:30

Sample ID: 18D0844-05

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	1.8	mg/Kg dry	80		SW-846 8082A	4/20/18	4/26/18 5:25	JMB
Aroclor-1221 [1]	ND	1.8	mg/Kg dry	80		SW-846 8082A	4/20/18	4/26/18 5:25	JMB
Aroclor-1232 [1]	ND	1.8	mg/Kg dry	80		SW-846 8082A	4/20/18	4/26/18 5:25	JMB
Aroclor-1242 [1]	ND	1.8	mg/Kg dry	80		SW-846 8082A	4/20/18	4/26/18 5:25	JMB
Aroclor-1248 [2]	8.5	1.8	mg/Kg dry	80		SW-846 8082A	4/20/18	4/26/18 5:25	JMB
Aroclor-1254 [1]	ND	1.8	mg/Kg dry	80		SW-846 8082A	4/20/18	4/26/18 5:25	JMB
Aroclor-1260 [1]	ND	1.8	mg/Kg dry	80		SW-846 8082A	4/20/18	4/26/18 5:25	JMB
Aroclor-1262 [1]	ND	1.8	mg/Kg dry	80		SW-846 8082A	4/20/18	4/26/18 5:25	JMB
Aroclor-1268 [1]	ND	1.8	mg/Kg dry	80		SW-846 8082A	4/20/18	4/26/18 5:25	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	4/26/18 5:25
Decachlorobiphenyl [2]	*	30-150	S-01	4/26/18 5:25
Tetrachloro-m-xylene [1]	*	30-150	S-01	4/26/18 5:25
Tetrachloro-m-xylene [2]	*	30-150	S-01	4/26/18 5:25

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: AJ13-E | Sampled: 4/18/2018 10:30

Sample ID: 18D0844-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.2		% Wt	1		SM 2540G	4/20/18	4/23/18 8:45	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3E-A | Sampled: 4/18/2018 10:50

Sample ID: 18D0844-06

Sample Matrix: Soil

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.47	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:11	PJG
Aroclor-1221 [1]	ND	0.47	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:11	PJG
Aroclor-1232 [1]	ND	0.47	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:11	PJG
Aroclor-1242 [1]	ND	0.47	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:11	PJG
Aroclor-1248 [1]	ND	0.47	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:11	PJG
Aroclor-1254 [1]	ND	0.47	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:11	PJG
Aroclor-1260 [1]	ND	0.47	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:11	PJG
Aroclor-1262 [1]	ND	0.47	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:11	PJG
Aroclor-1268 [1]	ND	0.47	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:11	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	82.1	30-150		5/1/18 17:11
Decachlorobiphenyl [2]	84.9	30-150		5/1/18 17:11
Tetrachloro-m-xylene [1]	98.9	30-150		5/1/18 17:11
Tetrachloro-m-xylene [2]	101	30-150		5/1/18 17:11

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3E-A | Sampled: 4/18/2018 10:50

Sample ID: 18D0844-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	69.1		% Wt	1		SM 2540G	5/24/18	5/24/18 14:45	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3E-B | Sampled: 4/18/2018 10:56

Sample ID: 18D0844-07

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 19:51	JMB
Aroclor-1221 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 19:51	JMB
Aroclor-1232 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 19:51	JMB
Aroclor-1242 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 19:51	JMB
Aroclor-1248 [2]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 19:51	JMB
Aroclor-1254 [2]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 19:51	JMB
Aroclor-1260 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 19:51	JMB
Aroclor-1262 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 19:51	JMB
Aroclor-1268 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 19:51	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	72.9	30-150		4/25/18 19:51
Decachlorobiphenyl [2]	74.6	30-150		4/25/18 19:51
Tetrachloro-m-xylene [1]	81.2	30-150		4/25/18 19:51
Tetrachloro-m-xylene [2]	79.6	30-150		4/25/18 19:51

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3E-B | Sampled: 4/18/2018 10:56

Sample ID: 18D0844-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.7		% Wt	1		SM 2540G	4/20/18	4/23/18 8:45	MRL

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Project Location: Greenwich, CT
Sample Description:
Work Order: 18D0844

Date Received: 4/19/2018
Field Sample #: F3E-C D
Sampled: 4/18/2018 10:54
Sample ID: 18D0844-08
Sample Matrix: Soil

WR 6/4/18

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:29	PJG
Aroclor-1221 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:29	PJG
Aroclor-1232 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:29	PJG
Aroclor-1242 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:29	PJG
Aroclor-1248 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:29	PJG
Aroclor-1254 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:29	PJG
Aroclor-1260 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:29	PJG
Aroclor-1262 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:29	PJG
Aroclor-1268 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:29	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	98.7	30-150		5/1/18 17:29
Decachlorobiphenyl [2]	109	30-150		5/1/18 17:29
Tetrachloro-m-xylene [1]	102	30-150		5/1/18 17:29
Tetrachloro-m-xylene [2]	103	30-150		5/1/18 17:29

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Project Location: Greenwich, CT
Sample Description:
Work Order: 18D0844

Date Received: 4/19/2018
Field Sample #: F3E-C D
Sampled: 4/18/2018 10:54
Sample ID: 18D0844-08
Sample Matrix: Soil

MR 6/4/18

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	31.7		% Wt	1		SM 2540G	5/24/18	5/24/18 14:45	MRL

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Project Location: Greenwich, CT
Sample Description:
Work Order: 18D0844

Date Received: 4/19/2018
Field Sample #: F3E-D C
Sampled: 4/18/2018 10:58
Sample ID: 18D0844-09
Sample Matrix: Soil
Sample Flags: DL-03

MR 6/4/18

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:47	PJG
Aroclor-1221 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:47	PJG
Aroclor-1232 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:47	PJG
Aroclor-1242 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:47	PJG
Aroclor-1248 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:47	PJG
Aroclor-1254 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:47	PJG
Aroclor-1260 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:47	PJG
Aroclor-1262 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:47	PJG
Aroclor-1268 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 17:47	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	62.8	30-150		5/1/18 17:47
Decachlorobiphenyl [2]	65.9	30-150		5/1/18 17:47
Tetrachloro-m-xylene [1]	43.1	30-150		5/1/18 17:47
Tetrachloro-m-xylene [2]	43.9	30-150		5/1/18 17:47

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Project Location: Greenwich, CT
Date Received: 4/19/2018
Field Sample #: F3E-J C
Sample ID: 18D0844-09
Sample Matrix: Soil

Sample Description:
Sampled: 4/18/2018 10:58

Work Order: 18D0844

MR 6/4/18

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	69.8		% Wt	1		SM 2540G	5/24/18	5/24/18 14:46	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3E-E | Sampled: 4/18/2018 10:52

Sample ID: 18D0844-10

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.082	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:09	JMB
Aroclor-1221 [1]	ND	0.082	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:09	JMB
Aroclor-1232 [1]	ND	0.082	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:09	JMB
Aroclor-1242 [1]	ND	0.082	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:09	JMB
Aroclor-1248 [2]	0.26	0.082	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:09	JMB
Aroclor-1254 [1]	ND	0.082	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:09	JMB
Aroclor-1260 [1]	ND	0.082	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:09	JMB
Aroclor-1262 [1]	ND	0.082	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:09	JMB
Aroclor-1268 [1]	ND	0.082	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:09	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	78.2	30-150		4/25/18 20:09
Decachlorobiphenyl [2]	85.7	30-150		4/25/18 20:09
Tetrachloro-m-xylene [1]	94.5	30-150		4/25/18 20:09
Tetrachloro-m-xylene [2]	91.6	30-150		4/25/18 20:09

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3E-E | Sampled: 4/18/2018 10:52

Sample ID: 18D0844-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.9		% Wt	1		SM 2540G	4/20/18	4/23/18 8:45	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F4E-A | Sampled: 4/18/2018 11:15

Sample ID: 18D0844-11

Sample Matrix: Soil

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:06	PJG
Aroclor-1221 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:06	PJG
Aroclor-1232 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:06	PJG
Aroclor-1242 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:06	PJG
Aroclor-1248 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:06	PJG
Aroclor-1254 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:06	PJG
Aroclor-1260 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:06	PJG
Aroclor-1262 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:06	PJG
Aroclor-1268 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:06	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	77.0	30-150		5/1/18 18:06
Decachlorobiphenyl [2]	79.9	30-150		5/1/18 18:06
Tetrachloro-m-xylene [1]	74.8	30-150		5/1/18 18:06
Tetrachloro-m-xylene [2]	76.5	30-150		5/1/18 18:06

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F4E-A | Sampled: 4/18/2018 11:15

Sample ID: 18D0844-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	71.6		% Wt	1		SM 2540G	5/24/18	5/24/18 14:46	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F4E-B | Sampled: 4/18/2018 11:17

Sample ID: 18D0844-12

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:28	JMB
Aroclor-1221 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:28	JMB
Aroclor-1232 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:28	JMB
Aroclor-1242 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:28	JMB
Aroclor-1248 [1]	0.38	0.087	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:28	JMB
Aroclor-1254 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:28	JMB
Aroclor-1260 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:28	JMB
Aroclor-1262 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:28	JMB
Aroclor-1268 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:28	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	77.7	30-150		4/25/18 20:28
Decachlorobiphenyl [2]	78.3	30-150		4/25/18 20:28
Tetrachloro-m-xylene [1]	88.1	30-150		4/25/18 20:28
Tetrachloro-m-xylene [2]	87.0	30-150		4/25/18 20:28

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F4E-B | Sampled: 4/18/2018 11:17

Sample ID: 18D0844-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.4		% Wt	1		SM 2540G	4/20/18	4/23/18 8:45	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F4E-C | Sampled: 4/18/2018 11:19

Sample ID: 18D0844-13

Sample Matrix: Soil

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.39	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:24	PJG
Aroclor-1221 [1]	ND	0.39	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:24	PJG
Aroclor-1232 [1]	ND	0.39	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:24	PJG
Aroclor-1242 [1]	ND	0.39	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:24	PJG
Aroclor-1248 [1]	ND	0.39	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:24	PJG
Aroclor-1254 [1]	ND	0.39	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:24	PJG
Aroclor-1260 [1]	ND	0.39	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:24	PJG
Aroclor-1262 [1]	ND	0.39	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:24	PJG
Aroclor-1268 [1]	ND	0.39	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:24	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	68.4	30-150		5/1/18 18:24
Decachlorobiphenyl [2]	70.7	30-150		5/1/18 18:24
Tetrachloro-m-xylene [1]	48.3	30-150		5/1/18 18:24
Tetrachloro-m-xylene [2]	49.6	30-150		5/1/18 18:24

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F4E-C | Sampled: 4/18/2018 11:19

Sample ID: 18D0844-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	62.6		% Wt	1		SM 2540G	5/24/18	5/24/18 14:46	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F4E-D | Sampled: 4/18/2018 11:21

Sample ID: 18D0844-14

Sample Matrix: Soil

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:42	PJG
Aroclor-1221 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:42	PJG
Aroclor-1232 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:42	PJG
Aroclor-1242 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:42	PJG
Aroclor-1248 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:42	PJG
Aroclor-1254 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:42	PJG
Aroclor-1260 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:42	PJG
Aroclor-1262 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:42	PJG
Aroclor-1268 [1]	ND	0.43	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 18:42	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	80.6	30-150		5/1/18 18:42
Decachlorobiphenyl [2]	87.1	30-150		5/1/18 18:42
Tetrachloro-m-xylene [1]	50.8	30-150		5/1/18 18:42
Tetrachloro-m-xylene [2]	52.5	30-150		5/1/18 18:42

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F4E-D | Sampled: 4/18/2018 11:21

Sample ID: 18D0844-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	35.9		% Wt	1		SM 2540G	5/24/18	5/24/18 14:46	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F4E-E | Sampled: 4/18/2018 11:23

Sample ID: 18D0844-15

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:46	JMB
Aroclor-1221 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:46	JMB
Aroclor-1232 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:46	JMB
Aroclor-1242 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:46	JMB
Aroclor-1248 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:46	JMB
Aroclor-1254 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:46	JMB
Aroclor-1260 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:46	JMB
Aroclor-1262 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:46	JMB
Aroclor-1268 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 20:46	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	80.6	30-150		4/25/18 20:46
Decachlorobiphenyl [2]	111	30-150		4/25/18 20:46
Tetrachloro-m-xylene [1]	93.2	30-150		4/25/18 20:46
Tetrachloro-m-xylene [2]	88.8	30-150		4/25/18 20:46

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F4E-E | Sampled: 4/18/2018 11:23

Sample ID: 18D0844-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.9		% Wt	1		SM 2540G	4/20/18	4/23/18 8:45	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3W-A | Sampled: 4/18/2018 11:35

Sample ID: 18D0844-16

Sample Matrix: Soil

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.34	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 19:00	PJG
Aroclor-1221 [1]	ND	0.34	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 19:00	PJG
Aroclor-1232 [1]	ND	0.34	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 19:00	PJG
Aroclor-1242 [1]	ND	0.34	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 19:00	PJG
Aroclor-1248 [1]	ND	0.34	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 19:00	PJG
Aroclor-1254 [1]	ND	0.34	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 19:00	PJG
Aroclor-1260 [1]	ND	0.34	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 19:00	PJG
Aroclor-1262 [1]	ND	0.34	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 19:00	PJG
Aroclor-1268 [1]	ND	0.34	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 19:00	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	76.8	30-150		5/1/18 19:00
Decachlorobiphenyl [2]	79.9	30-150		5/1/18 19:00
Tetrachloro-m-xylene [1]	60.8	30-150		5/1/18 19:00
Tetrachloro-m-xylene [2]	62.5	30-150		5/1/18 19:00

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3W-A | Sampled: 4/18/2018 11:35

Sample ID: 18D0844-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	69.1		% Wt	1		SM 2540G	5/24/18	5/24/18 14:47	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3W-B | Sampled: 4/18/2018 11:40

Sample ID: 18D0844-17

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.093	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:04	JMB
Aroclor-1221 [1]	ND	0.093	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:04	JMB
Aroclor-1232 [1]	ND	0.093	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:04	JMB
Aroclor-1242 [1]	ND	0.093	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:04	JMB
Aroclor-1248 [1]	ND	0.093	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:04	JMB
Aroclor-1254 [1]	ND	0.093	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:04	JMB
Aroclor-1260 [1]	ND	0.093	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:04	JMB
Aroclor-1262 [1]	ND	0.093	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:04	JMB
Aroclor-1268 [1]	ND	0.093	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:04	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	70.8	30-150		4/25/18 21:04
Decachlorobiphenyl [2]	72.7	30-150		4/25/18 21:04
Tetrachloro-m-xylene [1]	82.0	30-150		4/25/18 21:04
Tetrachloro-m-xylene [2]	77.7	30-150		4/25/18 21:04

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3W-B | Sampled: 4/18/2018 11:40

Sample ID: 18D0844-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.5		% Wt	1		SM 2540G	4/20/18	4/23/18 8:45	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3W-C | Sampled: 4/18/2018 11:35

Sample ID: 18D0844-18

Sample Matrix: Soil

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:07	PJG
Aroclor-1221 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:07	PJG
Aroclor-1232 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:07	PJG
Aroclor-1242 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:07	PJG
Aroclor-1248 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:07	PJG
Aroclor-1254 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:07	PJG
Aroclor-1260 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:07	PJG
Aroclor-1262 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:07	PJG
Aroclor-1268 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:07	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	88.1	30-150		5/1/18 20:07
Decachlorobiphenyl [2]	85.5	30-150		5/1/18 20:07
Tetrachloro-m-xylene [1]	54.4	30-150		5/1/18 20:07
Tetrachloro-m-xylene [2]	55.6	30-150		5/1/18 20:07

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3W-C | Sampled: 4/18/2018 11:35

Sample ID: 18D0844-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	66.4		% Wt	1		SM 2540G	5/24/18	5/24/18 14:47	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3W-D | Sampled: 4/18/2018 11:40

Sample ID: 18D0844-19

Sample Matrix: Soil

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:25	PJG
Aroclor-1221 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:25	PJG
Aroclor-1232 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:25	PJG
Aroclor-1242 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:25	PJG
Aroclor-1248 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:25	PJG
Aroclor-1254 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:25	PJG
Aroclor-1260 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:25	PJG
Aroclor-1262 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:25	PJG
Aroclor-1268 [1]	ND	0.48	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:25	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	86.8	30-150		5/1/18 20:25
Decachlorobiphenyl [2]	91.1	30-150		5/1/18 20:25
Tetrachloro-m-xylene [1]	61.0	30-150		5/1/18 20:25
Tetrachloro-m-xylene [2]	62.7	30-150		5/1/18 20:25

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3W-D | Sampled: 4/18/2018 11:40

Sample ID: 18D0844-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	31.9		% Wt	1		SM 2540G	5/24/18	5/24/18 14:47	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3W-E | Sampled: 4/18/2018 11:45

Sample ID: 18D0844-20

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:22	JMB
Aroclor-1221 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:22	JMB
Aroclor-1232 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:22	JMB
Aroclor-1242 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:22	JMB
Aroclor-1248 [2]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:22	JMB
Aroclor-1254 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:22	JMB
Aroclor-1260 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:22	JMB
Aroclor-1262 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:22	JMB
Aroclor-1268 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:22	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	80.1	30-150		4/25/18 21:22
Decachlorobiphenyl [2]	84.3	30-150		4/25/18 21:22
Tetrachloro-m-xylene [1]	98.7	30-150		4/25/18 21:22
Tetrachloro-m-xylene [2]	97.7	30-150		4/25/18 21:22

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0844

Date Received: 4/19/2018

Field Sample #: F3W-E | Sampled: 4/18/2018 11:45

Sample ID: 18D0844-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.6		% Wt	1		SM 2540G	4/20/18	4/23/18 8:46	MRL

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
18D0844-02 [AJ13-B]	B201448	04/20/18
18D0844-05 [AJ13-E]	B201448	04/20/18
18D0844-07 [F3E-B]	B201448	04/20/18
18D0844-10 [F3E-E]	B201448	04/20/18
18D0844-12 [F4E-B]	B201448	04/20/18
18D0844-15 [F4E-E]	B201448	04/20/18
18D0844-17 [F3W-B]	B201448	04/20/18
18D0844-20 [F3W-E]	B201448	04/20/18

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
18D0844-01 [AJ13-A]	B204211	05/24/18
18D0844-03 [AJ13-C]	B204211	05/24/18
18D0844-04 [AJ13-D]	B204211	05/24/18
18D0844-06 [F3E-A]	B204211	05/24/18
18D0844-08 [F3E-C]	B204211	05/24/18
18D0844-09 [F3E-D]	B204211	05/24/18
18D0844-11 [F4E-A]	B204211	05/24/18
18D0844-13 [F4E-C]	B204211	05/24/18
18D0844-14 [F4E-D]	B204211	05/24/18
18D0844-16 [F3W-A]	B204211	05/24/18
18D0844-18 [F3W-C]	B204211	05/24/18
18D0844-19 [F3W-D]	B204211	05/24/18

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
18D0844-01 [AJ13-A]	B201451	2.79	10.0	04/20/18
18D0844-03 [AJ13-C]	B201451	2.48	10.0	04/20/18
18D0844-04 [AJ13-D]	B201451	2.00	10.0	04/20/18
18D0844-06 [F3E-A]	B201451	2.15	10.0	04/20/18
18D0844-08 [F3E-C]	B201451	2.16	10.0	04/20/18
18D0844-09 [F3E-D]	B201451	2.40	10.0	04/20/18
18D0844-11 [F4E-A]	B201451	2.48	10.0	04/20/18
18D0844-13 [F4E-C]	B201451	2.55	10.0	04/20/18
18D0844-14 [F4E-D]	B201451	2.35	10.0	04/20/18
18D0844-16 [F3W-A]	B201451	2.90	10.0	04/20/18
18D0844-18 [F3W-C]	B201451	2.64	10.0	04/20/18
18D0844-19 [F3W-D]	B201451	2.08	10.0	04/20/18

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
18D0844-05 [AJ13-E]	B201398	10.1	10.0	04/20/18
18D0844-07 [F3E-B]	B201398	10.2	10.0	04/20/18
18D0844-10 [F3E-E]	B201398	10.8	10.0	04/20/18
18D0844-12 [F4E-B]	B201398	10.5	10.0	04/20/18
18D0844-15 [F4E-E]	B201398	10.4	10.0	04/20/18
18D0844-17 [F3W-B]	B201398	10.3	10.0	04/20/18
18D0844-20 [F3W-E]	B201398	10.2	10.0	04/20/18

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Sample Extraction Data

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
18D0844-02 [AJ13-B]	B201402	10.2	10.0	04/20/18

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QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B201398 - SW-846 3540C										
Blank (B201398-BLK1)				Prepared: 04/20/18 Analyzed: 04/25/18						
Aroclor-1016	ND	0.020	mg/Kg wet							
Aroclor-1016 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1221	ND	0.020	mg/Kg wet							
Aroclor-1221 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1232	ND	0.020	mg/Kg wet							
Aroclor-1232 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1242	ND	0.020	mg/Kg wet							
Aroclor-1242 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1248	ND	0.020	mg/Kg wet							
Aroclor-1248 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1254	ND	0.020	mg/Kg wet							
Aroclor-1254 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1260	ND	0.020	mg/Kg wet							
Aroclor-1260 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1262	ND	0.020	mg/Kg wet							
Aroclor-1262 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1268	ND	0.020	mg/Kg wet							
Aroclor-1268 [2C]	ND	0.020	mg/Kg wet							
Surrogate: Decachlorobiphenyl	*0.174*		mg/Kg wet	0.196		88.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.176*		mg/Kg wet	0.196		89.6	30-150			
Surrogate: Tetrachloro-m-xylene	*0.179*		mg/Kg wet	0.196		91.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.177*		mg/Kg wet	0.196		90.3	30-150			
LCS (B201398-BS1)				Prepared: 04/20/18 Analyzed: 04/25/18						
Aroclor-1016	0.17	0.019	mg/Kg wet	0.192		87.0	40-140			
Aroclor-1016 [2C]	0.17	0.019	mg/Kg wet	0.192		87.6	40-140			
Aroclor-1260	0.17	0.019	mg/Kg wet	0.192		90.7	40-140			
Aroclor-1260 [2C]	0.17	0.019	mg/Kg wet	0.192		90.5	40-140			
Surrogate: Decachlorobiphenyl	*0.171*		mg/Kg wet	0.192		89.1	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.174*		mg/Kg wet	0.192		90.2	30-150			
Surrogate: Tetrachloro-m-xylene	*0.171*		mg/Kg wet	0.192		89.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.169*		mg/Kg wet	0.192		87.7	30-150			
LCS Dup (B201398-BSD1)				Prepared: 04/20/18 Analyzed: 04/25/18						
Aroclor-1016	0.17	0.019	mg/Kg wet	0.190		89.8	40-140	2.24	30	
Aroclor-1016 [2C]	0.18	0.019	mg/Kg wet	0.190		94.0	40-140	6.08	30	
Aroclor-1260	0.18	0.019	mg/Kg wet	0.190		94.4	40-140	3.08	30	
Aroclor-1260 [2C]	0.18	0.019	mg/Kg wet	0.190		94.0	40-140	2.82	30	
Surrogate: Decachlorobiphenyl	*0.175*		mg/Kg wet	0.190		91.9	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.177*		mg/Kg wet	0.190		92.8	30-150			
Surrogate: Tetrachloro-m-xylene	*0.177*		mg/Kg wet	0.190		93.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.176*		mg/Kg wet	0.190		92.7	30-150			

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QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B201398 - SW-846 3540C											
Matrix Spike (B201398-MS1)	**Source: 18D0844-05**			Prepared: 04/20/18 Analyzed: 04/26/18							
Aroclor-1016	8.8	0.089	mg/Kg dry	0.222	ND	**3950**	*	40-140			MS-21
Aroclor-1016 [2C]	8.9	0.089	mg/Kg dry	0.222	ND	**4000**	*	40-140			MS-21
Aroclor-1260	0.90	0.089	mg/Kg dry	0.222	ND	**407**	*	40-140			MS-21
Aroclor-1260 [2C]	0.82	0.089	mg/Kg dry	0.222	ND	**369**	*	40-140			MS-21
Surrogate: Decachlorobiphenyl	*0.186*		mg/Kg dry	0.222		83.9		30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.201*		mg/Kg dry	0.222		90.7		30-150			
Surrogate: Tetrachloro-m-xylene	*0.212*		mg/Kg dry	0.222		95.5		30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.210*		mg/Kg dry	0.222		94.4		30-150			
Matrix Spike Dup (B201398-MSD1)	**Source: 18D0844-05**			Prepared: 04/20/18 Analyzed: 04/26/18							
Aroclor-1016	13	0.089	mg/Kg dry	0.222	ND	**6010**	*	40-140	41.4	50	MS-21
Aroclor-1016 [2C]	14	0.089	mg/Kg dry	0.222	ND	**6150**	*	40-140	42.5	50	MS-21
Aroclor-1260	1.2	0.089	mg/Kg dry	0.222	ND	**521**	*	40-140		50	MS-21
Aroclor-1260 [2C]	1.1	0.089	mg/Kg dry	0.222	ND	**508**	*	40-140		50	MS-21
Surrogate: Decachlorobiphenyl	*0.191*		mg/Kg dry	0.222		85.8		30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.208*		mg/Kg dry	0.222		93.5		30-150			
Surrogate: Tetrachloro-m-xylene	*0.216*		mg/Kg dry	0.222		97.3		30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.214*		mg/Kg dry	0.222		96.5		30-150			
Batch B201402 - SW-846 3540C											
Blank (B201402-BLK1)				Prepared: 04/20/18 Analyzed: 04/24/18							
Aroclor-1016	ND	0.020	mg/Kg wet								
Aroclor-1016 [2C]	ND	0.020	mg/Kg wet								
Aroclor-1221	ND	0.020	mg/Kg wet								
Aroclor-1221 [2C]	ND	0.020	mg/Kg wet								
Aroclor-1232	ND	0.020	mg/Kg wet								
Aroclor-1232 [2C]	ND	0.020	mg/Kg wet								
Aroclor-1242	ND	0.020	mg/Kg wet								
Aroclor-1242 [2C]	ND	0.020	mg/Kg wet								
Aroclor-1248	ND	0.020	mg/Kg wet								
Aroclor-1248 [2C]	ND	0.020	mg/Kg wet								
Aroclor-1254	ND	0.020	mg/Kg wet								
Aroclor-1254 [2C]	ND	0.020	mg/Kg wet								
Aroclor-1260	ND	0.020	mg/Kg wet								
Aroclor-1260 [2C]	ND	0.020	mg/Kg wet								
Aroclor-1262	ND	0.020	mg/Kg wet								
Aroclor-1262 [2C]	ND	0.020	mg/Kg wet								
Aroclor-1268	ND	0.020	mg/Kg wet								
Aroclor-1268 [2C]	ND	0.020	mg/Kg wet								
Surrogate: Decachlorobiphenyl	*0.171*		mg/Kg wet	0.198		86.2		30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.212*		mg/Kg wet	0.198		107		30-150			
Surrogate: Tetrachloro-m-xylene	*0.174*		mg/Kg wet	0.198		88.1		30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.177*		mg/Kg wet	0.198		89.5		30-150			

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QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B201402 - SW-846 3540C										
LCS (B201402-BS1)				Prepared: 04/20/18 Analyzed: 04/24/18						
Aroclor-1016	0.18	0.020	mg/Kg wet	0.198		91.9	40-140			
Aroclor-1016 [2C]	0.16	0.020	mg/Kg wet	0.198		82.6	40-140			
Aroclor-1260	0.16	0.020	mg/Kg wet	0.198		81.2	40-140			
Aroclor-1260 [2C]	0.16	0.020	mg/Kg wet	0.198		81.3	40-140			
Surrogate: Decachlorobiphenyl	*0.164*		mg/Kg wet	0.198		82.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.206*		mg/Kg wet	0.198		104	30-150			
Surrogate: Tetrachloro-m-xylene	*0.169*		mg/Kg wet	0.198		85.2	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.172*		mg/Kg wet	0.198		86.8	30-150			
LCS Dup (B201402-BSD1)				Prepared: 04/20/18 Analyzed: 04/24/18						
Aroclor-1016	0.19	0.020	mg/Kg wet	0.200		94.9	40-140	4.19	30	
Aroclor-1016 [2C]	0.17	0.020	mg/Kg wet	0.200		85.9	40-140	4.91	30	
Aroclor-1260	0.17	0.020	mg/Kg wet	0.200		84.1	40-140	4.43	30	
Aroclor-1260 [2C]	0.17	0.020	mg/Kg wet	0.200		84.8	40-140	5.24	30	
Surrogate: Decachlorobiphenyl	*0.171*		mg/Kg wet	0.200		85.4	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.214*		mg/Kg wet	0.200		107	30-150			
Surrogate: Tetrachloro-m-xylene	*0.189*		mg/Kg wet	0.200		94.4	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.178*		mg/Kg wet	0.200		89.1	30-150			
Batch B201451 - SW-846 3540C										
Blank (B201451-BLK1)				Prepared: 04/20/18 Analyzed: 04/30/18						
Aroclor-1016	ND	0.10	mg/Kg							
Aroclor-1016 [2C]	ND	0.10	mg/Kg							
Aroclor-1221	ND	0.10	mg/Kg							
Aroclor-1221 [2C]	ND	0.10	mg/Kg							
Aroclor-1232	ND	0.10	mg/Kg							
Aroclor-1232 [2C]	ND	0.10	mg/Kg							
Aroclor-1242	ND	0.10	mg/Kg							
Aroclor-1242 [2C]	ND	0.10	mg/Kg							
Aroclor-1248	ND	0.10	mg/Kg							
Aroclor-1248 [2C]	ND	0.10	mg/Kg							
Aroclor-1254	ND	0.10	mg/Kg							
Aroclor-1254 [2C]	ND	0.10	mg/Kg							
Aroclor-1260	ND	0.10	mg/Kg							
Aroclor-1260 [2C]	ND	0.10	mg/Kg							
Aroclor-1262	ND	0.10	mg/Kg							
Aroclor-1262 [2C]	ND	0.10	mg/Kg							
Aroclor-1268	ND	0.10	mg/Kg							
Aroclor-1268 [2C]	ND	0.10	mg/Kg							
Surrogate: Decachlorobiphenyl	*1.06*		mg/Kg	1.00		106	30-150			
Surrogate: Decachlorobiphenyl [2C]	*1.03*		mg/Kg	1.00		103	30-150			
Surrogate: Tetrachloro-m-xylene	*0.915*		mg/Kg	1.00		91.5	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.962*		mg/Kg	1.00		96.2	30-150			

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QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B201451 - SW-846 3540C											
LCS (B201451-BS1)				Prepared: 04/20/18 Analyzed: 04/30/18							
Aroclor-1016	0.98	0.10	mg/Kg	1.00		97.9		40-140			
Aroclor-1016 [2C]	1.0	0.10	mg/Kg	1.00		104		40-140			
Aroclor-1260	0.97	0.10	mg/Kg	1.00		97.4		40-140			
Aroclor-1260 [2C]	0.98	0.10	mg/Kg	1.00		98.2		40-140			
Surrogate: Decachlorobiphenyl	*1.15*		mg/Kg	1.00		115		30-150			
Surrogate: Decachlorobiphenyl [2C]	*1.10*		mg/Kg	1.00		110		30-150			
Surrogate: Tetrachloro-m-xylene	*0.988*		mg/Kg	1.00		98.8		30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*1.04*		mg/Kg	1.00		104		30-150			
LCS Dup (B201451-BSD1)				Prepared: 04/20/18 Analyzed: 04/30/18							
Aroclor-1016	0.89	0.10	mg/Kg	1.00		88.9		40-140	9.56	30	
Aroclor-1016 [2C]	0.95	0.10	mg/Kg	1.00		94.9		40-140	9.44	30	
Aroclor-1260	0.91	0.10	mg/Kg	1.00		90.9		40-140	6.92	30	
Aroclor-1260 [2C]	0.91	0.10	mg/Kg	1.00		90.9		40-140	7.69	30	
Surrogate: Decachlorobiphenyl	*1.05*		mg/Kg	1.00		105		30-150			
Surrogate: Decachlorobiphenyl [2C]	*1.00*		mg/Kg	1.00		100		30-150			
Surrogate: Tetrachloro-m-xylene	*0.878*		mg/Kg	1.00		87.8		30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.912*		mg/Kg	1.00		91.2		30-150			
Matrix Spike (B201451-MS1)	**Source: 18D0844-01**			Prepared: 04/20/18 Analyzed: 05/01/18							
Aroclor-1016	2.7	0.45	mg/Kg	0.893	ND	**300**	*	40-140			MS-21
Aroclor-1016 [2C]	2.6	0.45	mg/Kg	0.893	ND	**291**	*	40-140			MS-21
Aroclor-1260	0.76	0.45	mg/Kg	0.893	ND	85.6		40-140			
Aroclor-1260 [2C]	0.72	0.45	mg/Kg	0.893	ND	80.4		40-140			
Surrogate: Decachlorobiphenyl	*0.630*		mg/Kg	0.893		70.6		30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.650*		mg/Kg	0.893		72.8		30-150			
Surrogate: Tetrachloro-m-xylene	*0.784*		mg/Kg	0.893		87.8		30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.795*		mg/Kg	0.893		89.0		30-150			
Matrix Spike Dup (B201451-MSD1)	**Source: 18D0844-01**			Prepared: 04/20/18 Analyzed: 05/01/18							
Aroclor-1016	3.8	0.38	mg/Kg	0.752	ND	**502**	*	40-140	34.0	50	MS-21
Aroclor-1016 [2C]	3.2	0.38	mg/Kg	0.752	ND	**423**	*	40-140	20.1	50	MS-21
Aroclor-1260	0.73	0.38	mg/Kg	0.752	ND	96.8		40-140	4.90	50	
Aroclor-1260 [2C]	0.68	0.38	mg/Kg	0.752	ND	90.8		40-140	5.03	50	
Surrogate: Decachlorobiphenyl	*0.571*		mg/Kg	0.752		76.0		30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.589*		mg/Kg	0.752		78.4		30-150			
Surrogate: Tetrachloro-m-xylene	*0.689*		mg/Kg	0.752		91.6		30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.712*		mg/Kg	0.752		94.7		30-150			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B204211 - % Solids										
Duplicate (B204211-DUP1)	**Source: 18D0844-01**			Prepared & Analyzed: 05/24/18						
% Solids	81.7		% Wt		78.1			4.43	20	

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AJ13-A

Lab Sample ID: 18D0844-01 Date(s) Analyzed 05/01/2018 05/01/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1242	1	0.000	0.000	0.000	1.5	
	2	0.000	0.000	0.000	0.60	85.7

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AJ13-B

Lab Sample ID: 18D0844-02 Date(s) Analyzed 04/24/2018 04/24/2018

Instrument ID (1): ECD1 Instrument ID (2): ECD1

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1242	1	0.000	-0.030	0.030	1.7	
	2	0.000	-0.030	0.030	2.6	41.9

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AJ13-E

Lab Sample ID: 18D0844-05 Date(s) Analyzed 04/26/2018 04/26/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1248	1	0.000	-0.030	0.030	8.1	
	2	0.000	-0.030	0.030	8.5	4.8

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

F3E-E

Lab Sample ID: 18D0844-10 Date(s) Analyzed 04/25/2018 04/25/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1248	1	0.000	-0.030	0.030	0.22	
	2	0.000	-0.030	0.030	0.26	16.7

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

F4E-B

Lab Sample ID: 18D0844-12 Date(s) Analyzed 04/25/2018 04/25/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1248	1	0.000	-0.030	0.030	0.38	
	2	0.000	-0.030	0.030	0.35	8.2

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS

Lab Sample ID: B201398-BS1 Date(s) Analyzed 04/25/2018 04/25/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	-0.030	0.030	0.17	
	2	0.000	-0.030	0.030	0.17	0.0
Aroclor-1260	1	0.000	-0.030	0.030	0.17	
	2	0.000	-0.030	0.030	0.17	0.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B201398-BSD1 Date(s) Analyzed 04/25/2018 04/25/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	-0.030	0.030	0.17	
	2	0.000	-0.030	0.030	0.18	5.7
Aroclor-1260	1	0.000	-0.030	0.030	0.18	
	2	0.000	-0.030	0.030	0.18	0.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

Matrix Spike

Lab Sample ID: B201398-MS1 Date(s) Analyzed 04/26/2018 04/26/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	-0.030	0.030	8.8	
	2	0.000	-0.030	0.030	8.9	1.1
Aroclor-1260	1	0.000	-0.030	0.030	0.90	
	2	0.000	-0.030	0.030	0.82	9.3

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

Matrix Spike Dup

Lab Sample ID: B201398-MSD1 Date(s) Analyzed 04/26/2018 04/26/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	-0.030	0.030	13	
	2	0.000	-0.030	0.030	14	7.4
Aroclor-1260	1	0.000	-0.030	0.030	1.2	
	2	0.000	-0.030	0.030	1.1	8.7

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS

Lab Sample ID: B201402-BS1 Date(s) Analyzed 04/24/2018 04/24/2018

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	-0.030	0.030	0.18	
	2	0.000	-0.030	0.030	0.16	11.8
Aroclor-1260	1	0.000	-0.030	0.030	0.16	
	2	0.000	-0.030	0.030	0.16	0.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B201402-BSD1 Date(s) Analyzed 04/24/2018 04/24/2018

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	-0.030	0.030	0.19	
	2	0.000	-0.030	0.030	0.17	11.1
Aroclor-1260	1	0.000	-0.030	0.030	0.17	
	2	0.000	-0.030	0.030	0.17	0.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS

Lab Sample ID: B201451-BS1 Date(s) Analyzed 04/30/2018 04/30/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	0.98	
	2	0.000	0.000	0.000	1.0	2.0
Aroclor-1260	1	0.000	0.000	0.000	0.97	
	2	0.000	0.000	0.000	0.98	1.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B201451-BSD1 Date(s) Analyzed 04/30/2018 04/30/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	0.89	
	2	0.000	0.000	0.000	0.95	6.5
Aroclor-1260	1	0.000	0.000	0.000	0.91	
	2	0.000	0.000	0.000	0.91	0.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

Matrix Spike

Lab Sample ID: B201451-MS1 Date(s) Analyzed 05/01/2018 05/01/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	2.7	
	2	0.000	0.000	0.000	2.6	3.8
Aroclor-1260	1	0.000	0.000	0.000	0.76	
	2	0.000	0.000	0.000	0.72	6.7

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

Matrix Spike Dup

Lab Sample ID: B201451-MSD1 Date(s) Analyzed 05/01/2018 05/01/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	3.8	
	2	0.000	0.000	0.000	3.2	17.1
Aroclor-1260	1	0.000	0.000	0.000	0.73	
	2	0.000	0.000	0.000	0.68	7.1

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
DL-03	Elevated reporting limit due to matrix.
MS-21	Matrix spike and/or spike duplicate recovery bias high due to contribution of other Aroclors present in the source sample.
P-01	Result was confirmed using a dissimilar column. Relative percent difference between the two results was >40%. In accordance with the method, the higher result was reported.
P-02	Sample RPD between primary and confirmatory analysis exceeded 40%. Per EPA method 8000, the lower value was reported due to obvious chromatographic interference on the column with the higher result.
S-01	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8082A in Product/Solid	
Aroclor-1016	CT,NH,NY,ME,NC,VA
Aroclor-1016 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1221	CT,NH,NY,ME,NC,VA
Aroclor-1221 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1232	CT,NH,NY,ME,NC,VA
Aroclor-1232 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1242	CT,NH,NY,ME,NC,VA
Aroclor-1242 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1248	CT,NH,NY,ME,NC,VA
Aroclor-1248 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1254	CT,NH,NY,ME,NC,VA
Aroclor-1254 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1260	CT,NH,NY,ME,NC,VA
Aroclor-1260 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1262	NY,NC,VA
Aroclor-1262 [2C]	NY,NC,VA
Aroclor-1268	NY,NC,VA
Aroclor-1268 [2C]	NY,NC,VA
SW-846 8082A in Soil	
Aroclor-1016	CT,NH,NY,ME,NC,VA
Aroclor-1016 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1221	CT,NH,NY,ME,NC,VA
Aroclor-1221 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1232	CT,NH,NY,ME,NC,VA
Aroclor-1232 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1242	CT,NH,NY,ME,NC,VA
Aroclor-1242 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1248	CT,NH,NY,ME,NC,VA
Aroclor-1248 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1254	CT,NH,NY,ME,NC,VA
Aroclor-1254 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1260	CT,NH,NY,ME,NC,VA
Aroclor-1260 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1262	NY,NC,VA
Aroclor-1262 [2C]	NY,NC,VA
Aroclor-1268	NY,NC,VA
Aroclor-1268 [2C]	NY,NC,VA

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The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	03/1/2020
MA	Massachusetts DEP	M-MA100	06/30/2018
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2019
NY	New York State Department of Health	10899 NELAP	04/1/2019
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2019
RI	Rhode Island Department of Health	LAO00112	12/30/2018
NC	North Carolina Div. of Water Quality	652	12/31/2018
NJ	New Jersey DEP	MA007 NELAP	06/30/2018
FL	Florida Department of Health	E871027 NELAP	06/30/2018
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2018
ME	State of Maine	2011028	06/9/2019
VA	Commonwealth of Virginia	460217	12/14/2018
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2018
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2018
NC-DW	North Carolina Department of Health	25703	07/31/2018

18D0844

BIG DWG

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CHAIN OF CUSTODY RECORD

Doc # 381 Rev 1_03242017

39 Spruce Street
East Longmeadow, MA 01028

Page 1 of 3

Requested Turnaround Time
7-Day ☐ 10-Day ☐
Due Date: 5/3/18 (no sooner)

Rush-Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☒ EXCEL ☒
Other:
CLP Like Data Pkg Required: ☐
Email To: matthew.rood@aecom.com
Fax To #:

Company Name: AECOM
Address: 500 Enterprise Dr Ste 1A Rocky Hill CT
Phone: 860 263 5800
Project Name: Greenwich High School
Project Location: Greenwich CT
Project Number: 60432356
Project Manager: Matt Rood
Con-Test Quote Name/Number:
Invoice Recipient: Matt Rood
Sampled By: A. Bogucki, N. Flahive

ANALYSIS REQUESTED

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1]Matrix Code	Conc Code	PCB Soxhlet
01	AJ13-A	4/18/18	1015		X	O	U	X
02	AJ13-B	4/18/18	1020		X	O	U	X
03	AJ13-C	4/18/18	1020		X	O	U	X
04	AJ13-D	4/18/18	1025		X	O	U	X
05	AJ13-E	4/18/18	1030		X	O	U	X
06	F3E-A	4/18/18	1050		X	O	U	X
07	F3E-B	4/18/18	1056		X	O	U	X
08	F3E-C	4/18/18	1054		X	O	U	X
09	F3E-D	4/18/18	1058		X	O	U	X
10	F3E-E	4/18/18	1052		X	O	U	X

# of Containers
[2] Preservation Code
[3] Container Code

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

Comments:
Matrix= artificial turf components

Please use the following codes to indicate possible sample concentration within the **Conc Code** column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

[1] **Matrix Codes:**
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] **Preservation Codes:**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] **Container Codes:**
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Relinquished by: (signature)	Date/Time:
[signature]	
Received by: (signature) [signature] 4-19-18	Date/Time: 10:00
Relinquished by: (signature) [signature] 4-19-18	Date/Time: 615
Received by: (signature) [signature] 2.5 4/19/18	Date/Time: 1815
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Detection Limit Requirements
MA
CT
~~GA PMC~~ / RDFC
Other

Special Requirements
☐ MA MCP Required
MCP Certification Form Required
☒ CT RCP Required
RCP Certification Form Required
☐ MA State DW Required
PWSID #

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Project Entity
☐ Government ☒ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA

Other
☐ Chromatogram
☐ AIHA-LAP,LLC

PCB ONLY
☒ Soxhlet
☐ Non Soxhlet

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con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com

18D0844

http://www.contestlabs.com

CHAIN OF CUSTODY RECORD

Doc # 381 Rev 1_03242017

39 Spruce Street
East Longmeadow, MA 01028

Company Name: AECOM
Address: 500 Enterprise Dr Ste 1A Rocky Hill CT
Phone: 860 263 5800
Project Name: Greenwich High School
Project Location: Greenwich, CT
Project Number: 60432356
Project Manager: Matt Rood
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By: A. Boguchi, N. Flahive

Requested Turnaround Time
7-Day ☐ 10-Day ☐
Due Date: 5/3/18 (no sooner)

Rush-Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☒ EXCEL ☒
Other:
CLP Like Data Pkg Required: ☐
Email To: matthew.rood@aecom.com
Fax To #:

ANALYSIS REQUESTED

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1] Matrix Code	Conc Code	PCB Soxhlet										# of Containers	[2] Preservation Code	[3] Container Code
								10										1		A
11	F4E-A	4/18/18	1115		X	O	U	X												
12	F4E-B	4/18/18	1117		X	O	U	X												
13	F4E-C	4/18/18	1119		X	O	U	X												
14	F4E-D	4/18/18	1121		X	O	U	X												
15	F4E-E	4/18/18	1123		X	O	U	X												
16	F3W-A	4/18/18	1135		X	O	U	X												
17	F3W-B	4/18/18	1140		X	O	U	X												
18	F3W-C	4/18/18	1135		X	O	U	X												
19	F3W-D	4/18/18	1140		X	O	U	X												
20	F3W-E	4/18/18	1145		X	O	U	X												

Comments:
Matrix = artificial turf components

Please use the following codes to indicate possible sample concentration within the **Conc Code** column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

[1] Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] Container Codes:
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

	Date/Time:
Relinquished by: (signature)	
Received by: (signature)	4-19-18 1000
Relinquished by: (signature)	4-19-18 615
Received by: (signature)	4/19/18 1815
Relinquished by: (signature)	
Received by: (signature)	

Detection Limit Requirements
MA:
CT: RDEC
Other:

Special Requirements
☐ MA MCP Required
☐ MCP Certification Form Required
☒ CT RCP Required
☐ RCP Certification Form Required
☐ MA State DW Required
PWSID #

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Project Entity
☐ Government ☒ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA

Other
☐ Chromatogram
☐ *AIHA-LAP,LLC*

PCB ONLY
☒ Soxhlet
☐ Non Soxhlet

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con-test® ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client AECOM

Received By BLF Date 4/19/18 Time 1815

How were the samples received? In Cooler T No Cooler ____ On Ice T No Ice ____ Direct from Sampling ____ Ambient ____ Melted Ice ____

Were samples within Temperature? 2-6°C T By Gun # 577 Actual Temp - 2.5°C By Blank # ____ Actual Temp - ____

Was Custody Seal Intact? NA Were Samples Tampered with? NA

Was COC Relinquished ? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all pertinent Information? Client T Project T Analysis ID's T T Sampler Name T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified? ____

Are there Rushes? F Who was notified? ____

Are there Short Holds? F Who was notified? ____

Is there enough Volume? T

Is there Headspace where applicable? NA MS/MSD? F

Proper Media/Containers Used? T Is splitting samples required? F

Were trip blanks received? F On COC? NA

Do all samples have the proper pH? Acid NA Base NA

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	20
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

REASONABLE CONFIDENCE PROTOCOL
LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

Laboratory Name: Con-Test Analytical Laboratory

Client: AECOM Environment - Rocky Hill, CT

Project Location: Greenwich, CT

Project Number: 18D0844

Laboratory Sample ID(s):

18D0844-01 thru 18D0844-20

Sample Date(s):

04/18/2018

List RCP Methods Used:

SW-846 8082A

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CTDEP method-specific Reasonable Confidence Protocol documents?	☑ Yes ☐ No
1A	Were the method specified preservation and holding time requirements met?	☑ Yes ☐ No
1B	VPH and EPH Methods only: Was the VPH and EPH method conducted without significant modifications (see Section 11.3 of respective RCP methods)?	☐ Yes ☐ No ☑ N/A
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	☑ Yes ☐ No
3	Were samples received at an appropriate temperature (< 6 degrees C.)?	☑ Yes ☐ No ☐ N/A
4	Were all QA/QC performance criteria specified in the CTDEP Reasonable Confidence Protocol documents achieved?	☐ Yes ☑ No
5A	Were reporting limits specified or referenced on the chain-of-custody?	☑ Yes ☐ No
5B	Were these reporting limits met?	☑ Yes ☐ No
6	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	☑ Yes ☐ No
7	Are project-specific matrix spikes and laboratory duplicates included in this data set?	☑ Yes ☐ No

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A, or #1B is "No", the data package does not meet the requirements for "Reasonable Confidence."
This form may not be altered and all questions must be answered.

Tod E. Kopyscinski

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

Authorized Signature: Tod Kopyscinski **Position:** Laboratory Director

Printed Name: Tod E. Kopyscinski **Date:** 05/03/18

Name of Laboratory: Con-Test Analytical Laboratory

This certification form is to be used for RCP methods only.

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

May 25, 2018

Matthew Rood
AECOM Environment - Rocky Hill, CT
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067

Project Location: Greenwich, CT
Client Job Number:
Project Number: 60432356
Laboratory Work Order Number: 18D0847

Enclosed are results of analyses for samples received by the laboratory on April 19, 2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Aaron L. Benoit
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

AECOM Environment - Rocky Hill, CT
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067
ATTN: Matthew Rood

REPORT DATE: 5/25/2018

PURCHASE ORDER NUMBER: 99513ACM

PROJECT NUMBER: 60432356

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 18D0847

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Greenwich, CT

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
AA12-A	18D0847-01	Product/Solid		SM 2540G	
				SW-846 8082A	
AA12-B	18D0847-02	Soil		SM 2540G	
				SW-846 8082A	
AA12-C	18D0847-03	Product/Solid		SM 2540G	
				SW-846 8082A	
AA12-D	18D0847-04	Product/Solid		SM 2540G	
				SW-846 8082A	
AA12-E	18D0847-05	Soil		SM 2540G	
				SW-846 8082A	
F4W-A	18D0847-06	Product/Solid		SM 2540G	
				SW-846 8082A	
F4W-B	18D0847-07	Soil		SM 2540G	
				SW-846 8082A	
F4W-C	18D0847-08	Product/Solid		SM 2540G	
				SW-846 8082A	
F4W-D	18D0847-09	Product/Solid		SM 2540G	
				SW-846 8082A	
F4W-E	18D0847-10	Soil		SM 2540G	
				SW-846 8082A	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

REVISED REPORT 05/25/2018: Report revised to have all results reported as dry weight per client e-mail request on 5/23/2018.

SW-846 8082A

Qualifications:

DL-03

Elevated reporting limit due to matrix.

Analyte & Samples(s) Qualified:

18D0847-01[AA12-A], 18D0847-03[AA12-C], 18D0847-04[AA12-D], 18D0847-06[F4W-A], 18D0847-08[F4W-C], 18D0847-09[F4W-D]

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Project Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: AA12-A | Sampled: 4/18/2018 11:55

Sample ID: 18D0847-01

Sample Matrix: Product/Solid

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:43	PJG
Aroclor-1221 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:43	PJG
Aroclor-1232 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:43	PJG
Aroclor-1242 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:43	PJG
Aroclor-1248 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:43	PJG
Aroclor-1254 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:43	PJG
Aroclor-1260 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:43	PJG
Aroclor-1262 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:43	PJG
Aroclor-1268 [1]	ND	0.42	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 20:43	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	86.5	30-150		5/1/18 20:43
Decachlorobiphenyl [2]	88.2	30-150		5/1/18 20:43
Tetrachloro-m-xylene [1]	104	30-150		5/1/18 20:43
Tetrachloro-m-xylene [2]	106	30-150		5/1/18 20:43

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: AA12-A | Sampled: 4/18/2018 11:55

Sample ID: 18D0847-01

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	74.9		% Wt	1		SM 2540G	5/24/18	5/24/18 14:47	MRL

con-test® ANALYTICAL LABORATORY
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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: AA12-B | Sampled: 4/18/2018 11:55

Sample ID: 18D0847-02

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:40	JMB
Aroclor-1221 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:40	JMB
Aroclor-1232 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:40	JMB
Aroclor-1242 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:40	JMB
Aroclor-1248 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:40	JMB
Aroclor-1254 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:40	JMB
Aroclor-1260 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:40	JMB
Aroclor-1262 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:40	JMB
Aroclor-1268 [1]	ND	0.092	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 21:40	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	77.1	30-150		4/25/18 21:40
Decachlorobiphenyl [2]	77.9	30-150		4/25/18 21:40
Tetrachloro-m-xylene [1]	86.6	30-150		4/25/18 21:40
Tetrachloro-m-xylene [2]	85.2	30-150		4/25/18 21:40

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: AA12-B | Sampled: 4/18/2018 11:55

Sample ID: 18D0847-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.5		% Wt	1		SM 2540G	4/20/18	4/23/18 8:46	MRL

con-test® ANALYTICAL LABORATORY
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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: AA12-C | Sampled: 4/18/2018 12:00

Sample ID: 18D0847-03

Sample Matrix: Product/Solid

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:01	PJG
Aroclor-1221 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:01	PJG
Aroclor-1232 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:01	PJG
Aroclor-1242 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:01	PJG
Aroclor-1248 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:01	PJG
Aroclor-1254 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:01	PJG
Aroclor-1260 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:01	PJG
Aroclor-1262 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:01	PJG
Aroclor-1268 [1]	ND	0.38	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:01	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	82.0	30-150		5/1/18 21:01
Decachlorobiphenyl [2]	81.3	30-150		5/1/18 21:01
Tetrachloro-m-xylene [1]	60.5	30-150		5/1/18 21:01
Tetrachloro-m-xylene [2]	61.5	30-150		5/1/18 21:01

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: AA12-C | Sampled: 4/18/2018 12:00

Sample ID: 18D0847-03

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	64.1		% Wt	1		SM 2540G	5/24/18	5/24/18 14:47	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: AA12-D | Sampled: 4/18/2018 12:00

Sample ID: 18D0847-04

Sample Matrix: Product/Solid

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:19	PJG
Aroclor-1221 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:19	PJG
Aroclor-1232 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:19	PJG
Aroclor-1242 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:19	PJG
Aroclor-1248 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:19	PJG
Aroclor-1254 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:19	PJG
Aroclor-1260 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:19	PJG
Aroclor-1262 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:19	PJG
Aroclor-1268 [1]	ND	0.46	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:19	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	81.7	30-150		5/1/18 21:19
Decachlorobiphenyl [2]	85.3	30-150		5/1/18 21:19
Tetrachloro-m-xylene [1]	65.9	30-150		5/1/18 21:19
Tetrachloro-m-xylene [2]	67.5	30-150		5/1/18 21:19

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: AA12-D | Sampled: 4/18/2018 12:00

Sample ID: 18D0847-04

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	30.3		% Wt	1		SM 2540G	5/24/18	5/24/18 14:48	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: AA12-E | Sampled: 4/18/2018 12:05

Sample ID: 18D0847-05

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	4/20/18	4/26/18 5:43	JMB
Aroclor-1221 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	4/20/18	4/26/18 5:43	JMB
Aroclor-1232 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	4/20/18	4/26/18 5:43	JMB
Aroclor-1242 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	4/20/18	4/26/18 5:43	JMB
Aroclor-1248 [2]	1.9	0.43	mg/Kg dry	20		SW-846 8082A	4/20/18	4/26/18 5:43	JMB
Aroclor-1254 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	4/20/18	4/26/18 5:43	JMB
Aroclor-1260 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	4/20/18	4/26/18 5:43	JMB
Aroclor-1262 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	4/20/18	4/26/18 5:43	JMB
Aroclor-1268 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	4/20/18	4/26/18 5:43	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	110	30-150		4/26/18 5:43
Decachlorobiphenyl [2]	114	30-150		4/26/18 5:43
Tetrachloro-m-xylene [1]	111	30-150		4/26/18 5:43
Tetrachloro-m-xylene [2]	113	30-150		4/26/18 5:43

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: AA12-E | Sampled: 4/18/2018 12:05

Sample ID: 18D0847-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.3		% Wt	1		SM 2540G	4/20/18	4/23/18 8:46	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: F4W-A | Sampled: 4/18/2018 12:15

Sample ID: 18D0847-06

Sample Matrix: Product/Solid

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:38	PJG
Aroclor-1221 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:38	PJG
Aroclor-1232 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:38	PJG
Aroclor-1242 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:38	PJG
Aroclor-1248 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:38	PJG
Aroclor-1254 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:38	PJG
Aroclor-1260 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:38	PJG
Aroclor-1262 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:38	PJG
Aroclor-1268 [1]	ND	0.40	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:38	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	89.1	30-150		5/1/18 21:38
Decachlorobiphenyl [2]	92.4	30-150		5/1/18 21:38
Tetrachloro-m-xylene [1]	83.2	30-150		5/1/18 21:38
Tetrachloro-m-xylene [2]	85.5	30-150		5/1/18 21:38

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: F4W-A | Sampled: 4/18/2018 12:15

Sample ID: 18D0847-06

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	64.3		% Wt	1		SM 2540G	5/24/18	5/24/18 14:48	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: F4W-B | Sampled: 4/18/2018 12:15

Sample ID: 18D0847-07

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 22:16	JMB
Aroclor-1221 [1]	ND	0.10	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 22:16	JMB
Aroclor-1232 [1]	ND	0.10	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 22:16	JMB
Aroclor-1242 [1]	ND	0.10	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 22:16	JMB
Aroclor-1248 [1]	ND	0.10	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 22:16	JMB
Aroclor-1254 [2]	ND	0.10	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 22:16	JMB
Aroclor-1260 [1]	ND	0.10	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 22:16	JMB
Aroclor-1262 [1]	ND	0.10	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 22:16	JMB
Aroclor-1268 [1]	ND	0.10	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 22:16	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	66.9	30-150		4/25/18 22:16
Decachlorobiphenyl [2]	67.2	30-150		4/25/18 22:16
Tetrachloro-m-xylene [1]	74.6	30-150		4/25/18 22:16
Tetrachloro-m-xylene [2]	74.1	30-150		4/25/18 22:16

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: F4W-B | Sampled: 4/18/2018 12:15

Sample ID: 18D0847-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	77.6		% Wt	1		SM 2540G	4/20/18	4/23/18 8:46	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: F4W-C | Sampled: 4/18/2018 12:15

Sample ID: 18D0847-08

Sample Matrix: Product/Solid

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.41	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:56	PJG
Aroclor-1221 [1]	ND	0.41	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:56	PJG
Aroclor-1232 [1]	ND	0.41	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:56	PJG
Aroclor-1242 [1]	ND	0.41	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:56	PJG
Aroclor-1248 [1]	ND	0.41	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:56	PJG
Aroclor-1254 [1]	ND	0.41	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:56	PJG
Aroclor-1260 [1]	ND	0.41	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:56	PJG
Aroclor-1262 [1]	ND	0.41	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:56	PJG
Aroclor-1268 [1]	ND	0.41	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 21:56	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	89.6	30-150		5/1/18 21:56
Decachlorobiphenyl [2]	83.5	30-150		5/1/18 21:56
Tetrachloro-m-xylene [1]	54.8	30-150		5/1/18 21:56
Tetrachloro-m-xylene [2]	56.1	30-150		5/1/18 21:56

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: F4W-C | Sampled: 4/18/2018 12:15

Sample ID: 18D0847-08

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	66.2		% Wt	1		SM 2540G	5/24/18	5/24/18 14:48	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: F4W-D | Sampled: 4/18/2018 12:20

Sample ID: 18D0847-09

Sample Matrix: Product/Solid

Sample Flags: DL-03

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 22:14	PJG
Aroclor-1221 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 22:14	PJG
Aroclor-1232 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 22:14	PJG
Aroclor-1242 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 22:14	PJG
Aroclor-1248 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 22:14	PJG
Aroclor-1254 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 22:14	PJG
Aroclor-1260 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 22:14	PJG
Aroclor-1262 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 22:14	PJG
Aroclor-1268 [1]	ND	0.45	mg/Kg	5		SW-846 8082A	4/20/18	5/1/18 22:14	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	73.3	30-150		5/1/18 22:14
Decachlorobiphenyl [2]	76.3	30-150		5/1/18 22:14
Tetrachloro-m-xylene [1]	51.2	30-150		5/1/18 22:14
Tetrachloro-m-xylene [2]	51.7	30-150		5/1/18 22:14

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: F4W-D | Sampled: 4/18/2018 12:20

Sample ID: 18D0847-09

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	35.1		% Wt	1		SM 2540G	5/24/18	5/24/18 14:48	MRL

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: F4W-E | Sampled: 4/18/2018 12:20

Sample ID: 18D0847-10

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 23:42	JMB
Aroclor-1221 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 23:42	JMB
Aroclor-1232 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 23:42	JMB
Aroclor-1242 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 23:42	JMB
Aroclor-1248 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 23:42	JMB
Aroclor-1254 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 23:42	JMB
Aroclor-1260 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 23:42	JMB
Aroclor-1262 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 23:42	JMB
Aroclor-1268 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	4/20/18	4/25/18 23:42	JMB

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	81.5	30-150		4/25/18 23:42
Decachlorobiphenyl [2]	86.6	30-150		4/25/18 23:42
Tetrachloro-m-xylene [1]	99.0	30-150		4/25/18 23:42
Tetrachloro-m-xylene [2]	97.1	30-150		4/25/18 23:42

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18D0847

Date Received: 4/19/2018

Field Sample #: F4W-E | Sampled: 4/18/2018 12:20

Sample ID: 18D0847-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.3		% Wt	1		SM 2540G	4/20/18	4/23/18 8:46	MRL

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
18D0847-02 [AA12-B]	B201448	04/20/18
18D0847-05 [AA12-E]	B201448	04/20/18
18D0847-07 [F4W-B]	B201448	04/20/18
18D0847-10 [F4W-E]	B201448	04/20/18

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
18D0847-01 [AA12-A]	B204211	05/24/18
18D0847-03 [AA12-C]	B204211	05/24/18
18D0847-04 [AA12-D]	B204211	05/24/18
18D0847-06 [F4W-A]	B204211	05/24/18
18D0847-08 [F4W-C]	B204211	05/24/18
18D0847-09 [F4W-D]	B204211	05/24/18

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
18D0847-01 [AA12-A]	B201451	2.38	10.0	04/20/18
18D0847-03 [AA12-C]	B201451	2.64	10.0	04/20/18
18D0847-04 [AA12-D]	B201451	2.18	10.0	04/20/18
18D0847-06 [F4W-A]	B201451	2.48	10.0	04/20/18
18D0847-08 [F4W-C]	B201451	2.42	10.0	04/20/18
18D0847-09 [F4W-D]	B201451	2.20	10.0	04/20/18

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
18D0847-02 [AA12-B]	B201398	10.0	10.0	04/20/18
18D0847-05 [AA12-E]	B201398	10.2	10.0	04/20/18
18D0847-07 [F4W-B]	B201398	10.2	10.0	04/20/18
18D0847-10 [F4W-E]	B201398	10.1	10.0	04/20/18

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QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B201398 - SW-846 3540C										
Blank (B201398-BLK1)				Prepared: 04/20/18 Analyzed: 04/25/18						
Aroclor-1016	ND	0.020	mg/Kg wet							
Aroclor-1016 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1221	ND	0.020	mg/Kg wet							
Aroclor-1221 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1232	ND	0.020	mg/Kg wet							
Aroclor-1232 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1242	ND	0.020	mg/Kg wet							
Aroclor-1242 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1248	ND	0.020	mg/Kg wet							
Aroclor-1248 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1254	ND	0.020	mg/Kg wet							
Aroclor-1254 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1260	ND	0.020	mg/Kg wet							
Aroclor-1260 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1262	ND	0.020	mg/Kg wet							
Aroclor-1262 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1268	ND	0.020	mg/Kg wet							
Aroclor-1268 [2C]	ND	0.020	mg/Kg wet							
Surrogate: Decachlorobiphenyl	*0.174*		mg/Kg wet	0.196		88.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.176*		mg/Kg wet	0.196		89.6	30-150			
Surrogate: Tetrachloro-m-xylene	*0.179*		mg/Kg wet	0.196		91.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.177*		mg/Kg wet	0.196		90.3	30-150			
LCS (B201398-BS1)				Prepared: 04/20/18 Analyzed: 04/25/18						
Aroclor-1016	0.17	0.019	mg/Kg wet	0.192		87.0	40-140			
Aroclor-1016 [2C]	0.17	0.019	mg/Kg wet	0.192		87.6	40-140			
Aroclor-1260	0.17	0.019	mg/Kg wet	0.192		90.7	40-140			
Aroclor-1260 [2C]	0.17	0.019	mg/Kg wet	0.192		90.5	40-140			
Surrogate: Decachlorobiphenyl	*0.171*		mg/Kg wet	0.192		89.1	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.174*		mg/Kg wet	0.192		90.2	30-150			
Surrogate: Tetrachloro-m-xylene	*0.171*		mg/Kg wet	0.192		89.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.169*		mg/Kg wet	0.192		87.7	30-150			
LCS Dup (B201398-BSD1)				Prepared: 04/20/18 Analyzed: 04/25/18						
Aroclor-1016	0.17	0.019	mg/Kg wet	0.190		89.8	40-140	2.24	30	
Aroclor-1016 [2C]	0.18	0.019	mg/Kg wet	0.190		94.0	40-140	6.08	30	
Aroclor-1260	0.18	0.019	mg/Kg wet	0.190		94.4	40-140	3.08	30	
Aroclor-1260 [2C]	0.18	0.019	mg/Kg wet	0.190		94.0	40-140	2.82	30	
Surrogate: Decachlorobiphenyl	*0.175*		mg/Kg wet	0.190		91.9	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.177*		mg/Kg wet	0.190		92.8	30-150			
Surrogate: Tetrachloro-m-xylene	*0.177*		mg/Kg wet	0.190		93.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.176*		mg/Kg wet	0.190		92.7	30-150			

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QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B201451 - SW-846 3540C										
Blank (B201451-BLK1)				Prepared: 04/20/18 Analyzed: 04/30/18						
Aroclor-1016	ND	0.10	mg/Kg							
Aroclor-1016 [2C]	ND	0.10	mg/Kg							
Aroclor-1221	ND	0.10	mg/Kg							
Aroclor-1221 [2C]	ND	0.10	mg/Kg							
Aroclor-1232	ND	0.10	mg/Kg							
Aroclor-1232 [2C]	ND	0.10	mg/Kg							
Aroclor-1242	ND	0.10	mg/Kg							
Aroclor-1242 [2C]	ND	0.10	mg/Kg							
Aroclor-1248	ND	0.10	mg/Kg							
Aroclor-1248 [2C]	ND	0.10	mg/Kg							
Aroclor-1254	ND	0.10	mg/Kg							
Aroclor-1254 [2C]	ND	0.10	mg/Kg							
Aroclor-1260	ND	0.10	mg/Kg							
Aroclor-1260 [2C]	ND	0.10	mg/Kg							
Aroclor-1262	ND	0.10	mg/Kg							
Aroclor-1262 [2C]	ND	0.10	mg/Kg							
Aroclor-1268	ND	0.10	mg/Kg							
Aroclor-1268 [2C]	ND	0.10	mg/Kg							
Surrogate: Decachlorobiphenyl	*1.06*		mg/Kg	1.00		106	30-150			
Surrogate: Decachlorobiphenyl [2C]	*1.03*		mg/Kg	1.00		103	30-150			
Surrogate: Tetrachloro-m-xylene	*0.915*		mg/Kg	1.00		91.5	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.962*		mg/Kg	1.00		96.2	30-150			
LCS (B201451-BS1)				Prepared: 04/20/18 Analyzed: 04/30/18						
Aroclor-1016	0.98	0.10	mg/Kg	1.00		97.9	40-140			
Aroclor-1016 [2C]	1.0	0.10	mg/Kg	1.00		104	40-140			
Aroclor-1260	0.97	0.10	mg/Kg	1.00		97.4	40-140			
Aroclor-1260 [2C]	0.98	0.10	mg/Kg	1.00		98.2	40-140			
Surrogate: Decachlorobiphenyl	*1.15*		mg/Kg	1.00		115	30-150			
Surrogate: Decachlorobiphenyl [2C]	*1.10*		mg/Kg	1.00		110	30-150			
Surrogate: Tetrachloro-m-xylene	*0.988*		mg/Kg	1.00		98.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*1.04*		mg/Kg	1.00		104	30-150			
LCS Dup (B201451-BSD1)				Prepared: 04/20/18 Analyzed: 04/30/18						
Aroclor-1016	0.89	0.10	mg/Kg	1.00		88.9	40-140	9.56	30	
Aroclor-1016 [2C]	0.95	0.10	mg/Kg	1.00		94.9	40-140	9.44	30	
Aroclor-1260	0.91	0.10	mg/Kg	1.00		90.9	40-140	6.92	30	
Aroclor-1260 [2C]	0.91	0.10	mg/Kg	1.00		90.9	40-140	7.69	30	
Surrogate: Decachlorobiphenyl	*1.05*		mg/Kg	1.00		105	30-150			
Surrogate: Decachlorobiphenyl [2C]	*1.00*		mg/Kg	1.00		100	30-150			
Surrogate: Tetrachloro-m-xylene	*0.878*		mg/Kg	1.00		87.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.912*		mg/Kg	1.00		91.2	30-150			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B204211 - % Solids										
Duplicate (B204211-DUP2)	**Source: 18D0847-01**			Prepared & Analyzed: 05/24/18						
% Solids	77.0		% Wt		74.9			2.74	20	

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AA12-E

Lab Sample ID: 18D0847-05 Date(s) Analyzed 04/26/2018 04/26/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1248	1	0.000	-0.030	0.030	1.3	
	2	0.000	-0.030	0.030	1.9	37.5

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS

Lab Sample ID: B201398-BS1 Date(s) Analyzed 04/25/2018 04/25/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	-0.030	0.030	0.17	
	2	0.000	-0.030	0.030	0.17	0.0
Aroclor-1260	1	0.000	-0.030	0.030	0.17	
	2	0.000	-0.030	0.030	0.17	0.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B201398-BSD1 Date(s) Analyzed 04/25/2018 04/25/2018

Instrument ID (1): ECD3 Instrument ID (2): ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	-0.030	0.030	0.17	
	2	0.000	-0.030	0.030	0.18	5.7
Aroclor-1260	1	0.000	-0.030	0.030	0.18	
	2	0.000	-0.030	0.030	0.18	0.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS

Lab Sample ID: B201451-BS1 Date(s) Analyzed 04/30/2018 04/30/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	0.98	
	2	0.000	0.000	0.000	1.0	2.0
Aroclor-1260	1	0.000	0.000	0.000	0.97	
	2	0.000	0.000	0.000	0.98	1.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B201451-BSD1 Date(s) Analyzed 04/30/2018 04/30/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	0.89	
	2	0.000	0.000	0.000	0.95	6.5
Aroclor-1260	1	0.000	0.000	0.000	0.91	
	2	0.000	0.000	0.000	0.91	0.0

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
DL-03	Elevated reporting limit due to matrix.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8082A in Product/Solid	
Aroclor-1016	CT,NH,NY,ME,NC,VA
Aroclor-1016 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1221	CT,NH,NY,ME,NC,VA
Aroclor-1221 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1232	CT,NH,NY,ME,NC,VA
Aroclor-1232 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1242	CT,NH,NY,ME,NC,VA
Aroclor-1242 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1248	CT,NH,NY,ME,NC,VA
Aroclor-1248 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1254	CT,NH,NY,ME,NC,VA
Aroclor-1254 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1260	CT,NH,NY,ME,NC,VA
Aroclor-1260 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1262	NY,NC,VA
Aroclor-1262 [2C]	NY,NC,VA
Aroclor-1268	NY,NC,VA
Aroclor-1268 [2C]	NY,NC,VA
SW-846 8082A in Soil	
Aroclor-1016	CT,NH,NY,ME,NC,VA
Aroclor-1016 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1221	CT,NH,NY,ME,NC,VA
Aroclor-1221 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1232	CT,NH,NY,ME,NC,VA
Aroclor-1232 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1242	CT,NH,NY,ME,NC,VA
Aroclor-1242 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1248	CT,NH,NY,ME,NC,VA
Aroclor-1248 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1254	CT,NH,NY,ME,NC,VA
Aroclor-1254 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1260	CT,NH,NY,ME,NC,VA
Aroclor-1260 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1262	NY,NC,VA
Aroclor-1262 [2C]	NY,NC,VA
Aroclor-1268	NY,NC,VA
Aroclor-1268 [2C]	NY,NC,VA

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The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	03/1/2020
MA	Massachusetts DEP	M-MA100	06/30/2018
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2019
NY	New York State Department of Health	10899 NELAP	04/1/2019
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2019
RI	Rhode Island Department of Health	LAO00112	12/30/2018
NC	North Carolina Div. of Water Quality	652	12/31/2018
NJ	New Jersey DEP	MA007 NELAP	06/30/2018
FL	Florida Department of Health	E871027 NELAP	06/30/2018
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2018
ME	State of Maine	2011028	06/9/2019
VA	Commonwealth of Virginia	460217	12/14/2018
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2018
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2018
NC-DW	North Carolina Department of Health	25703	07/31/2018

con-test ANALYTICAL LABORATORY

18D0847

Phone: 413-525-2332
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Email: info@contestlabs.com

http://www.contestlabs.com

CHAIN OF CUSTODY RECORD

Doc # 381 Rev 1_03242017

39 Spruce Street
East Longmeadow, MA 01028

Company Name:	AECOM
Address:	500 Enterprise Dr Ste 1A Rocky Hill CT
Phone:	860 263 5800
Project Name:	Greenwich High School
Project Location:	Greenwich CT
Project Number:	60432356
Project Manager:	Matt Rood
Con-Test Quote Name/Number:	
Invoice Recipient:	
Sampled By:	A. Bogucki, N. Flahive

Requested Turnaround Time
7-Day ☐ 10-Day ☐
Due Date: 5/3/18 (no sooner)

Rush Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☒ EXCEL ☒
Other:
CLP Like Data Pkg Required: ☐
Email To: matthew.rood@aecom.com
Fax To #:

ANALYSIS REQUESTED

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1] Matrix Code	Conc Code	PCB Soxhlet										# of Containers	[2] Preservation Code	[3] Container Code
01	AA12-A	4/18/18	1155		X	O	U	X										10	I	A
02	AA12-B	4/18/18	1155		X	O	U	X												
03	AA12-C	4/18/18	1200		X	O	U	X												
04	AA12-D	4/18/18	1200		X	O	U	X												
05	AA12-E	4/18/18	1205		X	O	U	X												
06	F4W-A	4/18/18	1215		X	O	U	X												
07	F4W-B	4/18/18	1215		X	O	U	X												
08	F4W-C	4/18/18	1215		X	O	U	X												
09	F4W-D	4/18/18	1220		X	O	U	X												
10	F4W-E	4/18/18	1220		X	O	U	X												

Comments:
Matrix = artificial turf components

Please use the following codes to indicate possible sample concentration within the **Conc Code** column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

[1] Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] Container Codes:
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time: 4.19.18 1000
Relinquished by: (signature)	Date/Time: 4.19.18 615
Received by: (signature)	Date/Time: 4/19/18 1815
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Detection Limit Requirements
MA
CT: RDEC
Other

Special Requirements
☐ MA MCP Required
☐ MCP Certification Form Required
☒ CT RCP Required
☐ RCP Certification Form Required
☐ MA State DW Required
PWSID #

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NELAC and AIHA-LAP, LLC Accredited

Project Entity
☐ Government ☒ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA

Other
☐ Chromatogram
☐ *AIHA-LAP,LLC*

PCB ONLY
☒ Soxhlet
☐ Non Soxhlet

Table of Contents

con-test® ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client AECOM

Received By BLF Date 4/19/18 Time 1815

How were the samples received? In Cooler T No Cooler ____ On Ice T No Ice ____ Direct from Sampling ____ Ambient ____ Melted Ice ____

Were samples within Temperature? 2-6°C T By Gun # 577 Actual Temp - 2.5°C By Blank # ____ Actual Temp - ____

Was Custody Seal Intact? NA Were Samples Tampered with? NA

Was COC Relinquished ? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all pertinent Information? Client T Project T Analysis ID's T Sampler Name T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified? ____

Are there Rushes? F Who was notified? ____

Are there Short Holds? F Who was notified? ____

Is there enough Volume? T

Is there Headspace where applicable? NA MS/MSD? F

Proper Media/Containers Used? T Is splitting samples required? F

Were trip blanks received? F On COC? NA

Do all samples have the proper pH? Acid NA Base NA

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	10
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

REASONABLE CONFIDENCE PROTOCOL
LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

Laboratory Name: Con-Test Analytical Laboratory

Client: AECOM Environment - Rocky Hill, CT

Project Location: Greenwich, CT

Project Number: 18D0847

Laboratory Sample ID(s):

18D0847-01 thru 18D0847-10

Sample Date(s):

04/18/2018

List RCP Methods Used:

SW-846 8082A

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CTDEP method-specific Reasonable Confidence Protocol documents?	☑ Yes ☐ No
1A	Were the method specified preservation and holding time requirements met?	☑ Yes ☐ No
1B	VPH and EPH Methods only: Was the VPH and EPH method conducted without significant modifications (see Section 11.3 of respective RCP methods)?	☐ Yes ☐ No ☑ N/A
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	☑ Yes ☐ No
3	Were samples received at an appropriate temperature (< 6 degrees C.)?	☑ Yes ☐ No ☐ N/A
4	Were all QA/QC performance criteria specified in the CTDEP Reasonable Confidence Protocol documents achieved?	☑ Yes ☐ No
5A	Were reporting limits specified or referenced on the chain-of-custody?	☑ Yes ☐ No
5B	Were these reporting limits met?	☑ Yes ☐ No
6	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	☑ Yes ☐ No
7	Are project-specific matrix spikes and laboratory duplicates included in this data set?	☐ Yes ☑ No

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A, or #1B is "No", the data package does not meet the requirements for "Reasonable Confidence."
This form may not be altered and all questions must be answered.

Tod E. Kopyscinski

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

Authorized Signature:  **Position:** Laboratory Director

Printed Name: Tod E. Kopyscinski **Date:** 05/02/18

Name of Laboratory: Con-Test Analytical Laboratory

This certification form is to be used for RCP methods only.

Attachment C – Human Health Risk Assessment

AECOM
1155 Elm Street
Suite 401
Manchester, NH 03101
www.aecom.com

603.263.2145 tel
603.606.4801 fax

Memorandum

To	Patrick Haskell	Page	1
CC			
Subject	Greenwich High School Human Health Risk Evaluation		
From	Julie Kabel		
Date	June 4, 2018		

Samples of the synthetic (artificial) turf on Greenwich High School (GHS) athletic fields #3 and #4 were collected in April 2018 and analyzed for polychlorinated biphenyl (PCB) Aroclors. Turf samples consisted of multiple layers, with the top layers consisting of a (A) turf grass/mat with a layer of crumb rubber (B). This memorandum presents a human health risk assessment (HHRA) of PCB Aroclor concentrations detected in the A and B layers of the turf material, which are the most likely to be contacted by users of the fields. The primary objective of this HHRA is to identify whether PCB Aroclor concentrations present within the turf material on the GHS athletic fields pose unacceptable risks to those potentially exposed to them (e.g., students, teachers, coaches, spectators, maintenance personnel, etc.).

This HHRA was performed consistent with the approach and methods used to conduct the March 2013 site-wide HHRA (AECOM, 2013a) performed in support of the Remedial Investigation for the GHS property (AECOM, 2013b). The site-wide HHRA evaluated potential risks based on site soil, groundwater, surface water, sediment, outdoor air, and soil vapor data). The HHRA used standard methodology prescribed by the United States Environmental Protection Agency (EPA). Updates to exposure scenarios, exposure assumptions, and toxicity values used in the 2013 HHRA have been made, as appropriate, based on the currently available EPA guidance and to account for media-specific considerations associated with potential exposure to synthetic turf. Specific deviations from the 2013 HHRA are discussed further in this memorandum.

This memorandum is organized into the following sections in accordance with the four-step paradigm for HHRA developed by EPA (EPA, 1989):

- Data Evaluation
- Dose-Response Assessment
- Exposure Assessment
- Risk Characterization

Data Evaluation

In April 2018, samples were collected from the “A” (turf grass/mat) and “B” (crumb rubber) layers of the synthetic turf material (as well as deeper materials not discussed in this HHRA, but included in

Table 1). Samples were collected at six locations on GHS fields #3 and #4 and analyzed for PCB Aroclors via EPA Method SW-846 8082A. **Table 1** presents a summary of the analytical data for PCB Aroclors in the turf samples, including the three deeper layers below the field turf (i.e., drainage layer, cushion, and stone base). **Figure 1** presents the sample locations.

No PCB Aroclors were detected in the A and B layers at 8 of the 10 surficial samples. The only PCB Aroclors detected in any of the samples collected are Aroclor 1242 (detected in samples AJ13-A and AJ13-B in both the A and B layers) and Aroclor 1248 (detected at location F4E-B). The analytical laboratory data were validated and identified as appropriate for use. The validation is summarized in a separate technical memorandum.

In the 2013 HHRA, total PCB Aroclor concentrations were calculated per sample by summing the detected results. Where a sample does not have any detection of individual Aroclors, then the total concentration was considered a non-detect with a reporting limit equal to the maximum reporting limit of the individual Aroclors. No more than one PCB Aroclor was detected in any of the April 2018 turf samples. Therefore, the total PCB Aroclor concentration within each sample is equal to the concentration of the one detected PCB Aroclor. The following table provides a summary of the detected analytical results and the calculated Total PCB Aroclor concentrations used for evaluation in the HHRA.

Location:	AJ13		F4E	
Sample ID:	AJ13-A	AJ13-B	F4E-A	F4E-B
Compound / Result (mg/kg)				
Aroclor 1242	**0.77 J**	**2.6 J**	ND (0.40)	ND (0.087)
Aroclor 1248	ND (0.36)	ND (0.46) UJ	ND (0.40)	**0.38**
Total PCB Aroclors (calculated result)	**0.77 J**	**2.6 J**	ND (0.40)	**0.38**

Notes:
mg/kg – milligram per kilogram.
ND – Not detected above the laboratory reporting limit (shown in parentheses).
Bolding indicates detected results.

There are no published screening levels available for synthetic turf. Therefore, turf results were compared to soil screening levels. The maximum detected Total PCB Aroclor concentration of 2.6 mg/kg, which occurred in the crumb rubber (B) layer, is greater than the conservative risk-based soil screening levels used to select compounds of potential concern (COPC) for further site-specific evaluation in the HHRA. These screening levels are equal to the EPA Regional Screening Levels (RSLs; EPA, 2018) for residential and industrial soil (0.23 mg/kg and 0.94 mg/kg, respectively). The RSLs are based on a target excess lifetime cancer risk (ELCR) of $1x10^{-6}$ and noncancer hazard quotient (HQ) of 1. As discussed in the 2013 HHRA, the residential and industrial RSLs used to select COPCs for further evaluation are considered overly conservative for evaluation of exposure scenarios associated with the GHS. The residential soil RSLs are based on EPA's default residential exposure frequency of 350 days/year and exposure duration of 26 years. The industrial RSLs are based on the default 250 days/year exposure frequency and 25 year default exposure duration for workers. Residential RSLs were used to select COPCs for evaluation of non-worker receptors in the HHRA. This is considered conservative, because it is anticipated that the site will continue to be used for non-residential purposes (e.g., as a school) in the future and because students and teachers are only potentially exposed for fewer days/year and for fewer years than is assumed for a residential exposure scenario. The industrial RSLs were used for selecting COPCs for evaluating workers at the school. Use of the industrial RSLs for evaluation of the worker receptors at the GHS is conservative because both the on-Site outdoor maintenance worker (groundskeeper) and the construction worker are expected to be exposed fewer days during the year than is assumed for the RSLs. Based on the

comparison of the maximum detected PCB Aroclors concentration to soil screening levels, PCB Aroclors were evaluated further in the HHRA.

Dose-Response Assessment

The HHRA follows EPA's guidance regarding the hierarchy of sources of human health dose-response values (EPA, 2003). Toxicity information for PCB Aroclors is available from the primary (Tier 1) EPA source, the Integrated Risk Information System (IRIS) (EPA, 2018). **Tables 2 and 3** summarize the chronic toxicity information associated with the potential carcinogenic and noncarcinogenic effects, respectively, of total PCB Aroclors for the oral route of exposure. This information includes the cancer slope factor (CSF) and noncancer reference dose (RfD). EPA has not developed toxicity values for dermal exposure; therefore, in accordance with EPA guidance (EPA, 2004), oral toxicity values with appropriate adjustments are used to evaluate dermal exposures. The dermal absorption factor for soil, presented on **Table 4**, was used in the HHRA for evaluation of exposure to PCB Aroclors in turf samples.

Risks from potential exposures to PCB Aroclors were calculated using the most current guidance available from EPA. Currently, EPA-approved guidance is provided in IRIS (EPA, 2018). Total PCB Aroclor concentrations were used to calculate the PCB exposure dose to be combined with the verified cancer slope factor (CSF) listed in IRIS (EPA, 2018). Guidance provided in IRIS specifies three tiers of human CSFs for environmental PCBs: high risk and persistence, low risk and persistence, and lowest risk and persistence. The choice of slope factors for use depends on the exposure route, environmental medium of exposure, and PCB chlorine content, as outlined in IRIS (EPA, 2018). These values and their selection criteria are presented below.

HIGH RISK AND PERSISTENCE Upper-bound CSF 2.0 milligram per kilogram per day [$(mg/kg\text{-}day)^{-1}$] Central-estimate CSF: 1.0 $(mg/kg\text{-}day)^{-1}$ Basis: Several studies on carcinogenicity of Aroclor 1260 and 1254
Criteria for use: - Food chain exposure - Sediment or soil ingestion - Dust or aerosol inhalation - Dermal exposure, if an absorption factor has been applied - Presence of dioxin-like, tumor-promoting, or persistent congeners - Early-life exposure (all pathways)
LOW RISK AND PERSISTENCE Upper-bound CSF: 0.4 $(mg/kg\text{-}day)^{-1}$ Central-estimate CSF: 0.3 $(mg/kg\text{-}day)^{-1}$ Basis: Several studies of carcinogenicity of Aroclor 1242
Criteria for use: - Ingestion of water-soluble congeners - Inhalation of evaporated congeners - Dermal exposure if no absorption factor has been applied
LOWEST RISK AND PERSISTENCE Upper-bound CSF: 0.07 $(mg/kg\text{-}day)^{-1}$ Central-estimate CSF: 0.04 $(mg/kg\text{-}day)^{-1}$ Basis: Several studies on carcinogenicity of Aroclor 1016
Criteria for use: Congener or isomer analyses verify that congeners with more than 4 chlorines comprise less than 0.5% of total PCBs.

In this HHRA, the potential ELCR was evaluated using two different oral CSFs. The upper-bound CSF value of 0.4 per mg/kg-day for the low risk and persistence CSF was used and is considered the appropriate CSF for evaluating the potential ELCR associated with incidental ingestion and dermal

contact of Aroclor 1242 (Cogliano, 1998). The upper-bound CSF value of 2 per mg/kg-day for high risk and persistence PCBs was also conservatively used for informational purposes. However, this CSF, which was developed based on studies of Aroclor 1254 and 1260, likely over-estimates the potential ELCR associated with Aroclor 1242 and 1248, the only PCB Aroclors detected in the April 2018 surficial turf samples at GHS.

An oral RfD is not available for total PCBs and is only available for two of the Aroclors analyzed (Aroclor 1254 and Aroclor 1016), neither of which were detected in any of the turf samples collected at GHS. As a conservative measure, chronic noncancer hazards associated with potential exposures to total PCB Aroclors were calculated using the most conservative RfD available of $2x10^{-5}$ mg/kg-day, which is based on Aroclor 1254.

Exposure Assessment

The receptors and soil exposure scenarios evaluated in the 2013 HHRA were reviewed to determine whether a potentially complete exposure pathway to PCB Aroclors in turf may exist, based on current and potential future exposures under the current land use of the property as a high school. The receptors evaluated in this HHRA and for which a potentially complete exposure pathway associated with PCB Aroclors in turf may exist are listed below:

- On-Site Outdoor Maintenance Worker (Groundskeeper)
- Construction/Utility Worker
- Student/Outdoor Athlete
- Teacher/Outdoor Coach
- Site Visitor (Spectator)

The above receptors were evaluated in this HHRA, assuming they may be exposed to PCB Aroclors in the surficial turf layers A and B via incidental ingestion and dermal contact. The exposure assumptions used to evaluate potential exposure are presented per receptor on **Tables 5 through 9**. The exposure assumptions are consistent with those used in the 2013 HHRA, with updates to reflect the most currently available EPA guidance on default exposure assumptions for determining body weight and skin surface area (EPA, 2011 and 2014). Dermal absorption fractions for soil (EPA, 2004) were also conservatively utilized for evaluation of turf. The use of exposure assumptions and absorption fractions associated with soil contact pathways for the evaluation of the potential exposure to synthetic turf is considered overly-conservative and is considered to result in an overestimation of potential risk/hazard. Unlike soil, the synthetic materials (grass mat and crumb rubber) are not likely to adhere to the skin to the extent assumed in this HHRA. Therefore, it is less likely that this material will be incidentally ingested via hand to mouth contact and/or dermally absorbed.

Exposure to PCBs in outdoor air (originating from turf) was not quantitatively evaluated in this HHRA technical memorandum. In the 2013 HHRA, direct measurements of PCBs in outdoor air were collected and quantitatively evaluated. The estimated potential risk/hazard associated with PCBs in outdoor air were insignificant in comparison to those estimated based on exposure via the soil ingestion/dermal contact exposure pathway. The addition of the potential risk/hazard estimates associated with the direct outdoor air measurements from the 2013 HHRA do not affect the potential risk/hazard estimates calculated based on the ingestion/dermal contact with turf exposure pathways in this HHRA. In addition, the generation of fugitive dust from synthetic turf is expected to be minimal. Therefore, exposure to PCB Aroclors in fugitive dust is not considered a complete exposure pathway associated with synthetic turf.

Exposure doses for oral and dermal exposure with turf were calculated consistent with the methods used in the 2013 HHRA and in accordance with EPA guidance (EPA, 1989 and 2004). The exposure point concentration (EPC) used to estimate the potential exposure to total PCB Aroclors in surficial turf in this HHRA is the maximum detected concentration of 2.6 mg/kg. The use of the maximum detected concentration as the EPC is conservative, because given the low frequency of detection in the surficial turf samples (detected in 2 of the 10 locations sampled), it is highly unlikely that receptors are being exposed to this concentration over the entire exposure period being evaluated.

Risk Characterization

The potential ELCR and noncancer hazard index (HI) associated with exposure to the maximum concentration of total PCB Aroclors detected in surficial turf layers A and B (via the incidental ingestion and dermal contact exposure pathways) were calculated for each receptor in accordance with EPA guidance, consistent with the methods used in the 2013 HHRA.

Excess lifetime risks on the order of one in a million ($1x10^{-6}$) have been discussed in regulatory applications as the level of risk considered to be *de minimis*. In other words, excess risks on the order of one in a million or $1x10^{-6}$ are so low that they do not require further consideration. Consultation with EPA Region 1 at the time of the 2013 HHRA indicated that the cumulative maximum "acceptable" cancer risk precedent established for schools in EPA Region 1 is $1x10^{-5}$ (1 chance in 100,000 of developing cancer). The Connecticut Department of Energy and Environmental Protection (CT DEEP) Remediation Standard Regulations (RSRs) requires that the cumulative ELCR for an area with multiple chemicals does not exceed a cancer risk level of $1x10^{-5}$ (CT DEEP, 2013). Therefore, consistent with the 2013 HHRA, a cumulative maximum acceptable cancer risk target of $1x10^{-5}$ was used for purposes of putting potential cancer risks estimated in this HHRA into perspective. For noncarcinogens, a cumulative potential HI of 1 (per target organ/endpoint) was used, in accordance with EPA guidance.

A summary of the potential ELCR and HI estimates for each of the receptors evaluated in this HHRA is provided in the table below. As previously discussed, the potential ELCR for each exposure scenario was evaluated using two different oral CSFs. The upper-bound CSF value based on low risk and persistence PCBs is considered the appropriate CSF for evaluating the potential ELCR associated with incidental ingestion and dermal contact of Aroclor 1242 (Cogliano, 1998). The upper-bound CSF value based on high risk and persistence PCBs (i.e., Aroclor 1254 and 1260) was also conservatively used for informational purposes. However, this CSF is considered to over-estimate the potential ELCR associated with Aroclor 1242 and 1248, the only PCB Aroclors detected in the April 2018 surficial turf samples at GHS.

The potential ELCR estimates for all scenarios are less than $1x10^{-5}$, the cumulative maximum "acceptable" cancer risk precedent established for schools in EPA Region 1. The potential ELCR estimates based on the CSF for low risk and persistence PCBs are less than $1x10^{-6}$ for all exposure scenarios. The potential ELCR estimates based on the CSF for the conservative high risk and persistence PCBs are less than $1x10^{-6}$ for four out of the five exposure scenarios evaluated. For one of the five exposure scenarios evaluated, the maintenance worker (groundskeeper), the potential ELCR is only slightly higher than $1x10^{-6}$ ($2x10^{-6}$). Note that the potential risk is calculated assuming a 25 year exposure duration, which may be overly conservative for the Site. The potential noncancer HIs for all scenarios are less than EPA's target HI of 1.

Exposure Scenario	Potential ELCR		Potential HI (c)
	Using CSF for Low Risk and Persistence (a)	Using CSF for High Risk and Persistence (b)	
On-Site Outdoor Maintenance Worker (Groundskeeper)	4E-07	2E-06	0.1
Construction/Utility Worker	3E-08	2E-07	0.3
Student/Outdoor Athlete	8E-08	4E-07	0.2
Teacher/Outdoor Coach	1E-07	6E-07	0.04
Site Visitor (Spectator)	1E-07	7E-07	0.2

Notes:

(a) The associated potential ELCRs were estimated using the upper-bound oral CSF for low risk PCBs of 0.4 $(mg/kg\text{-}day)^{-1}$.

(b) The associated potential ELCRs were estimated using the upper-bound oral CSF for high risk PCBs of 2.0 $(mg/kg\text{-}day)^{-1}$.

(c) The potential HIs were estimated using the noncancer oral RfD for Aroclor-1254 of $2x10^{-5}$ mg/kg.

The detailed risk calculations are provided in **Attachment A**.

Conclusions

Based on the results of this HHRA, there is no unacceptable health risk/hazard associated with exposure to Total PCB Aroclor concentrations detected in surficial turf (A and B layers) samples. The potential cancer risk estimates are less than the cumulative maximum acceptable cancer risk level established for schools in EPA Region 1 ($1x10^{-5}$). With one exception, potential cancer risks are less than the level of risk considered to be *de minimis* ($1x10^{-6}$). The potential cancer risk for one exposure scenario, based on an overly-conservative cancer toxicity value, slightly exceeds $1x10^{-6}$. The potential noncancer HIs for all scenarios are less than EPA's target HI of 1.

Several conservative assumptions have been incorporated into this HHRA, as discussed throughout this memorandum, which are considered to result in an over-estimate of the potential risk/hazard associated with exposure to total PCB Aroclor concentrations in surficial turf material. These conservatisms include the evaluation of turf sample results using parameters associated with soil exposure, use of an EPC equal to the maximum total PCB Aroclor concentration detected in turf samples, and use of conservative toxicity factors based on PCB Aroclors with a higher potential toxicity level than those detected in turf samples, etc.). As a result, the conclusions of this HHRA are considered to be health-protective of Site-specific receptors at the GHS.

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Tables

Table 1
Summary of Field Turf Sampling Results
Field #3 and Field #4
Greenwich High School
Greenwich, Connecticut

		Sample Identifier, Sampling Date, Lab Deliverable #, and Result														
Analyte	Units	AJ13-A 4/19/2018 18D0844	AJ13-B 4/19/2018 18D0844	AJ13-C 4/19/2018 18D0844	AJ13-D 4/19/2018 18D0844	AJ13-E 4/19/2018 18D0844	F3E-A 4/19/2018 18D0844	F3E-B 4/19/2018 18D0844	F3E-C 4/19/2018 18D0844	F3E-D 4/19/2018 18D0844	F3E-E 4/19/2018 18D0844	F4E-A 4/19/2018 18D0844	F4E-B 4/19/2018 18D0844	F4E-C 4/19/2018 18D0844	F4E-D 4/19/2018 18D0844	F4E-E 4/19/2018 18D0844
Percent Solids	%	78.1	85.7	64.8	27.4	89.2	69.1	85.7	69.8	31.7	89.9	71.6	87.4	62.6	35.9	90.9
PCBs By SW8082A																
Aroclor 1016	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1221	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1232	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1242	mg/Kg	0.77 J	2.6 J	<0.62	<1.82	8.5	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1248	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	0.26	<0.56	0.38	<0.62	<1.20	<0.085
Aroclor 1254	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1260	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1262	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Aroclor 1268	mg/Kg	<0.46	<0.46 UJ	<0.62	<1.82	<1.8	<0.68	<0.092	<0.60	<1.45	<0.082	<0.56	<0.087	<0.62	<1.20	<0.085
Total PCBs	mg/Kg	0.77 J	2.6 J	ND	ND	8.5	ND	ND	ND	ND	0.26	ND	0.38	ND	ND	ND

Notes:
Detections presented in bold text.
mg/kg = Milligrams per kilogram.
<0.46 = Analyte not detected at a concentration greater than given laboratory reporting limit.
Lab report gives results for layers A, D, and E as wet weight. Calculated dry weight results are provided above.
AJ13-A = Sample from Turf Layer A - Grass carpet
AJ13-B = Sample from Turf Layer B - Crumb rubber infill
AJ13-C = Sample from Turf Layer C - Polystyrene drainage blanket
AJ13-D = Sample from Turf Layer D - Cushion
AJ13-E = Sample from Turf Layer E - Structural stone fill

Table 1
Summary of Field Turf Sampling Results
Field #3 and Field #4
Greenwich High School
Greenwich, Connecticut

		Sample Identifier, Sampling Date, Lab Deliverable #, and Result														
Analyte	Units	F3W-A 4/19/2018 18D0844	F3W-B 4/19/2018 18D0844	F3W-C 4/19/2018 18D0844	F3W-D 4/19/2018 18D0844	F3W-E 4/19/2018 18D0844	AA12-A 4/19/2018 18D0847	AA12-B 4/19/2018 18D0847	AA12-C 4/19/2018 18D0847	AA12-D 4/19/2018 18D0847	AA12-E 4/19/2018 18D0847	F4W-A 4/19/2018 18D0847	F4W-B 4/19/2018 18D0847	F4W-C 4/19/2018 18D0847	F4W-D 4/19/2018 18D0847	F4W-E 4/19/2018 18D0847
Percent Solids	%	69.1	83.5	66.4	31.9	89.6	74.9	86.5	64.1	30.3	91.3	64.3	77.6	66.2	35.1	90.3
PCBs By SW8082A																
Aroclor 1016	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1221	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1232	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1242	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1248	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	1.9 JN	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1254	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1260	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1262	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Aroclor 1268	mg/Kg	<0.49	<0.093	<0.57	<1.50	<0.088	<0.56	<0.092	<0.59	<1.52	<0.43	<0.62	<0.10	<0.62	<1.28	<0.088
Total PCBs	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9 JN	ND	ND	ND	ND	ND

Notes:
Detections presented in bold text.
mg/kg = Milligrams per kilogram.
<0.46 = Analyte not detected at a concentration greater than given laboratory reporting limit.
Lab report gives results for layers A, D, and E as wet weight. Calculated dry weight results are provided above.
AJ13-A = Sample from Turf Layer A - Grass carpet
AJ13-B = Sample from Turf Layer B - Crumb rubber infill
AJ13-C = Sample from Turf Layer C - Polystyrene drainage blanket
AJ13-D = Sample from Turf Layer D - Cushion
AJ13-E = Sample from Turf Layer E - Structural stone fill

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Table 2
Dose-Response Information For Total PCBs With Potential Noncarcinogenic Effects From Chronic Exposure Through The Oral Route
Human Health Risk Assessment

Greenwich High School
10 Hillside Road
Greenwich, CT

Compound	CAS Number	Oral RfD (mg/kg-day)	Fraction Absorbed ABS_{GI} (a)	Dermal RfD (b) (mg/kg-day)	Reference (Last Verified)	USEPA Confidence Level	Uncertainty Factor	Modifying Factor	Target Organ/ Critical Effect at LOAEL	Study Animal	Study Method
Total PCB Aroclors	RACALC-PCB	2.00E-05 (c)	--	2.00E-05 (c)	IRIS (5/2018)	MEDIUM	300	None	Ocular exudate, inflamed and prominent Meibomian glands, distorted growth of finger and toe nails; decreased antibody (IgG and IgM) response to sheep erythrocytes	MONKEY	ORAL: CAPSULE

Notes:
"--" - No adjustment necessary.
ABS_{GI} - Fraction of compound absorbed in the gastrointestinal tract (dimensionless).
CAS - Chemical Abstracts Service.
IgG - Immunoglobulin G.
IgM - Immunoglobulin M.
IRIS - EPA's Integrated Risk Information System, an online computer database of toxicological information.
LOAEL - Lowest Observed Adverse Effects Level.
mg/kg-day - Milligrams per kilogram per day.
PCBs - Polychlorinated biphenyls.
RfD - Reference Dose.
USEPA - United States Environmental Protection Agency.
(a) USEPA, 2004. Risk Assessment Guidance for Superfund. Volume 1, Part E, Supplemental Guidance for Dermal Risk Assessment. Exhibit 4-1. Where USEPA, 2004 does not recommend adjustments, no value is listed.
(b) Oral RfD multiplied by ABS_{GI}. Where no adjustment is recommended by USEPA, 2004, Dermal RfD = Oral RfD.
(c) Value for Aroclor 1254 used; this is the only Aroclor with an available RfD.

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Table 3
Dose-Response Information For Total PCBs With Potential Carcinogenic Effects Through The Oral Route
Human Health Risk Assessment

Greenwich High School
10 Hillside Road
Greenwich, CT

Compound	CAS Number	Mutagenic Mode of Action? (a)	USEPA Carcinogen Class	Oral CSF $(mg/kg\text{-}day)^{-1}$	Fraction Absorbed ABS_{GI} (b)	Dermal CSF (b) $(mg/kg\text{-}day)^{-1}$	Reference (Last Verified)	Study Animal	Study Method
Total PCB Aroclors (High Risk)	RACALC-PCB-HighRisk	No	B2	2.00E+00 (c)	--	2.00E+00 (c)	IRIS (5/2018)	RAT	ORAL: DIET
Total PCB Aroclors (Low Risk)	RACALC-PCB-LowRisk	No	B2	4.00E-01 (d)	--	4.00E-01 (d)	IRIS (5/2018)	RAT	ORAL: DIET

Notes:
ABS_{GI} - Fraction of compound absorbed in the gastrointestinal tract (dimensionless).
B2 - Probable human carcinogen based on sufficient evidence of carcinogenicity in animals.
CAS - Chemical Abstracts Service.
CSF - Cancer Slope Factor.
IRIS - USEPA's Integrated Risk Information System, an online computer database of toxicological information.
mg/kg-day - Milligrams per kilogram per day.
PCBs - Polychlorinated biphenyls.
USEPA - United States Environmental Protection Agency.
(a) As indicated by USEPA's Regional Screening Level (RSL) Table. May 2018.
(b) Oral CSF divided by ABS_{GI}. Where no adjustment is recommended, Dermal CSF = Oral CSF.
(c) Value for polychlorinated biphenyls (high risk).
(d) Value for polychlorinated biphenyls (low risk).

Table 4
Dermal Absorption Fractions For Soil
Human Health Risk Assessment

Compound	CAS	Dermal Absorption Fraction ABS_d (a)
Total PCB Aroclors	RACALC-PCB	0.14

Notes:
CAS - Chemical Abstracts Service.
PCBs - Polychlorinated biphenyls.
(a) USEPA, 2004. Risk Asessment Guidance for Superfund (RAGS).
Volume 1, Part E, Supplemental Guidance for Dermal Risk Assessment. Exhibit 3-4.

Table 5
Summary Of Potential Exposure Assumptions -
Outdoor Maintenance Worker (Groundskeeper)
Human Health Risk Assessment

Parameter	Outdoor Maintenance Worker (Groundskeeper)	
Parameters Used in the Surface Turf Pathway		
Exposure Frequency (days/year)	150	(c)
Exposure Duration (yr)	25	(a)
Ingestion Rate (mg/day)	100	(a)
Skin Contacting Medium (cm^2)	3300	(b)(e)
Adherence Factor (mg/cm^2)	0.2	(d)
Body Weight (kg)	80	(a)

Notes:
EPA, 2004. Risk Assessment Guidance for Superfund, Supplemental Guidance for Dermal Risk Assessment. July 2004.
(a) EPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120. February 2014; Corrected September 2015.
(b) EPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.
(c) Assumes 5 days/week while the ground is not frozen or snow covered (i.e., April through October – 30 weeks).
(d) EPA, 2004. Exhibit 3-3. 95th percentile value for landscaper.
(e) EPA, 2004. Exhibit 3-5, recommended value.

Table 6
Summary Of Potential Exposure Assumptions -
Construction/Utility Worker
Human Health Risk Assessment

Parameter	Construction/Utility Worker	
Parameters Used in the Surface Turf Pathway		
Exposure Frequency (days/year)	130	(b)
Exposure Duration (yr)	1	(c)
Soil Ingestion Rate (mg/day)	330	(f)
Exposed Skin Surface Area (cm^2)	3300	(e)(f)
Adherence Factor (mg/cm^2)	0.3	(a)
Body Weight (kg)	80	(d)

Notes:
EPA, 2004. Risk Assessment Guidance for Superfund, Supplemental Guidance for Dermal Risk Assessment.
(a) EPA, 2004. Exhibit 3-3, recommended values for construction workers.
(b) Exposure frequency is equivalent to 5 days per week for 6 months.
(c) Construction activities are assumed to occur within a 1 year period.
(d) EPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120. February 2014; Corrected September 2015.
(e) EPA, 2004. Exhibit 3-5, recommended value.
(f) EPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. Exhibit 1-2.

Table 7
Summary Of Potential Exposure Assumptions -
Student/Outdoor Athlete (14-17 Years Old)
Human Health Risk Assessment

Parameter	Student/Outdoor Athlete (14 - 17 Years Old) Student/ Outdoor Athlete	
Parameters Used in the Surface Turf Pathway		
Exposure Frequency (days/year)	120	(c)
Exposure Duration (yr)	4	(e)
Ingestion Rate (mg/day)	100	(a)
Exposed Skin Surface Area (cm^2)	3989	(b)
Adherence Factor (mg/cm^2)	0.3	(d)
Body Weight (kg)	64	(e)

Notes:
EPA, 2004. Risk Assessment Guidance for Superfund, Supplemental Guidance for Dermal Risk Assessment. July 2004.
EPA, 2011. Exposure Factors Handbook.
(a) EPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120. February 2014; Corrected September 2015.
(b) EPA, 2011. Represents 50th percentile surface area for males and females, including face, hands, forearms, and lower legs (Table 7-2) for ages 11 to <21 years old, selected to be representative of a high school student ages 14 to <17 years old.
(c) Assumes students plays afterschool sports outside for 3 hours per day for 120 days (2 seasons).
(d) EPA, 2004. Exhibit 3-3, recommended value for soccer players.
(e) EPA, 2011. Recommended mean body weight for males and females of the associated age group (Table 8-10).

Table 8
Summary Of Potential Exposure Assumptions -
Teacher (Coach of Outdoor Sport)
Human Health Risk Assessment

Parameter	Teacher (Coach of Outdoor Sport)	
	Teacher (Coach of Outdoor Sport)	
Parameters Used in the Surface Turf Pathway		
Exposure Frequency (days/year)	60	(a)
Exposure Duration (yr)	25	(b)
Ingestion Rate (mg/day)	100	(b)
Exposed Skin Surface Area (cm^2)	4782	(c)
Adherence Factor (mg/cm^2)	0.07	(d)
Body Weight (kg)	80	(b)

Notes:
EPA, 2011. EPA Exposure Factors Handbook.
EPA, 2004. Risk Assessment Guidance for Superfund, Supplemental Guidance for Dermal Risk Assessment. July 2004.
(a) Assumes coaches are involved in an afterschool sport outside for 3 hours per day, 5 days per week for 60 days (1 season).
(b) EPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120. February 2014; Corrected September 2015.
(c) EPA, 2011. Represents 50th percentile surface area for males and females, including hands, forearms, and lower legs. (Table 7-2).
(d) EPA, 2004. Exhibit 3-5, recommended value.

Table 9
Summary Of Potential Exposure Assumptions -
Site Visitor/Spectator (Adult And Child)
Human Health Risk Assessment

Parameter	Site Visitor/Spectator (Adult and Child)							
	Assumptions for Noncarcinogenic Evaluation		Assumptions for Carcinogenic Evaluation					
	Young Child (0 to 6 yrs)		Young Child (0 to <2 yrs)		Older Child (2 to 8 yrs)		Adult	
Parameters Used in the Surface Turf Pathway								
Exposure Frequency (days/year)	36.2	(b)	36.2	(b)	36.2	(b)	36.2	(b)
Exposure Duration (yr)	6	(a)	2	(e)	6	(e)	8	(e)
Ingestion Rate (mg/day)	200	(a)	200	(a)	100	(a)	100	(a)
Exposed Skin Surface Area (cm^2)	1717	(d)	1226	(d)	900	(d)	4782	(d)
Adherence Factor (mg/cm^2)	0.2	(f)	0.2	(f)	0.2	(f)	0.07	(f)
Body Weight (kg)	15	(a)	10	(c)	20	(c)	80	(a)

Notes:
EPA, 2004. Risk Assessment Guidance for Superfund, Supplemental Guidance for Dermal Risk Assessment. July 2004.
EPA, 2011. Exposure Factors Handbook.
(a) EPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120. February 2014; Corrected September 2015.
(b) Assumes visitor attends sports event twice per week for total 181 day school year. Exposure frequencies were determined assuming a visitor splits his/her time spent attending sports events at the school over their entire exposure duration between indoor and outdoor sports events.
(c) EPA, 2011. Recommended mean body weights for the associated age range (Table 7-3).The value for the older child is based on the 2 to <6 year age range rounded up.
(d) EPA, 2011. Represents 50th percentile surface area for males and females, including hands, forearms, and lower legs (and feet for the children only) (Tables 7-2). The value for the older child is based on the 2 to <6 year age range rounded up.
(e) Duration reflects a total of 8 years spent visiting the school for a sports event, assuming parents have 2 children attending high school sports in two separate four year periods.
(f) EPA, 2004. Exhibit 3-5, recommended value.

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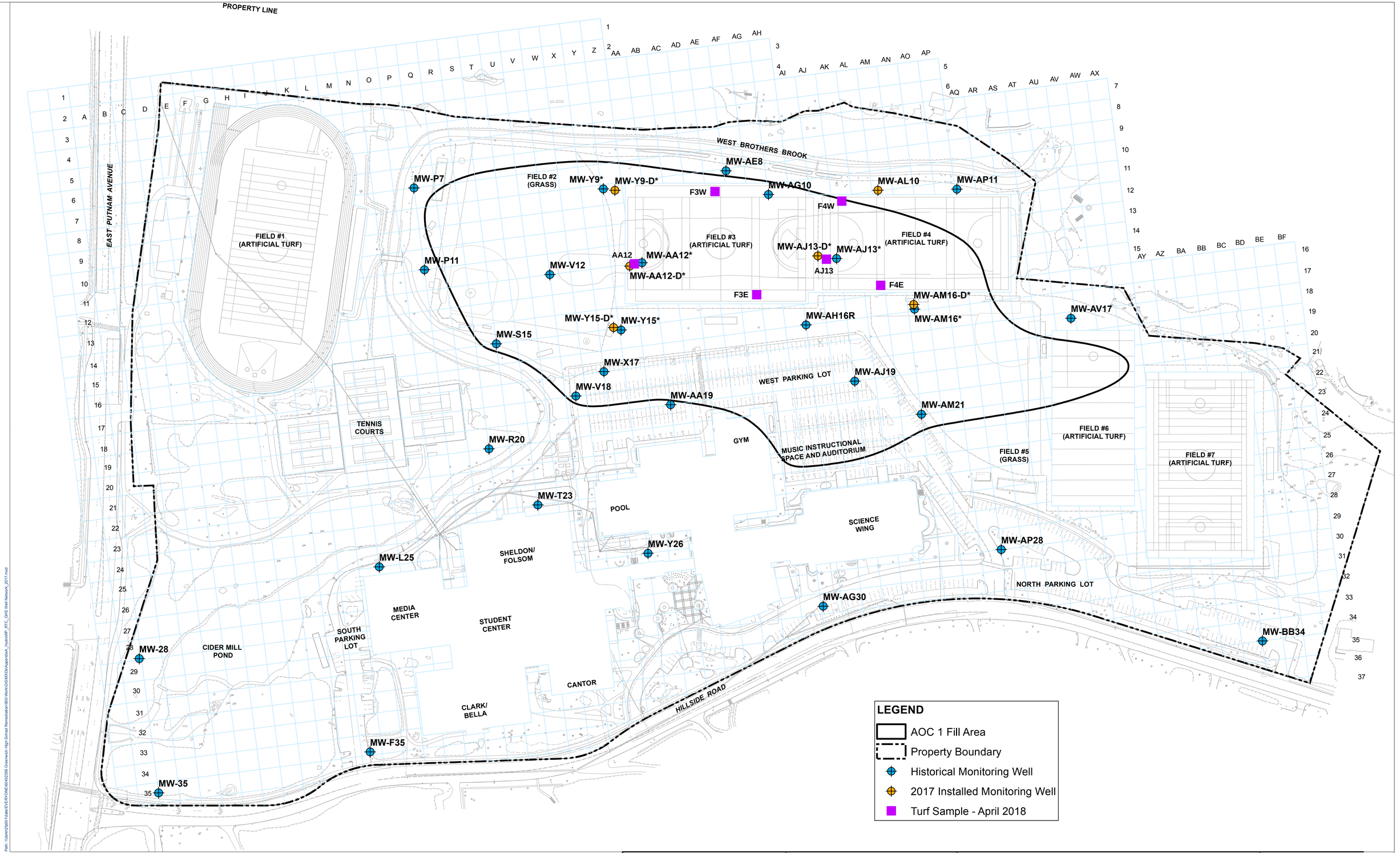
Figure



SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

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SCALE:
1" = 80'
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 1
TURF SAMPLING LOCATIONS - APRIL 2018

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

JOB 60225155
FILE NO.
CAD FILE
SHEET

AECOM

Attachment A
Risk/Hazard Calculation Spreadsheets

Outdoor Maintenance Worker (Groundskeeper)

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
CARCINOGENIC ASSESSMENT FOR OUTDOOR MAINTENANCE WORKER (GROUNDSKEEPER)
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

Receptors Evaluated:	
Receptor 1:	Groundskeeper

Pathways Evaluated:	
Media:	Surface Turf
Pathway 1:	Incidental Ingestion
Pathway 2:	Dermal Contact

Parameter	Receptor	Assumed Value	Units	Calculated Value
Soil Ingestion Rate	Groundskeeper	100	(mg soil/day)	
Adherence Factor	Groundskeeper	0.2	(mg/cm^2)	
Skin Exposed	Groundskeeper	3300	(cm^2)	
Body Weight	Groundskeeper	80	(kg)	
Exposure Frequency	Groundskeeper	150	(days)/365(days) =	4.11E-01
Exposure Duration	Groundskeeper	25	(years)/70(years) =	3.57E-01
Lifetime		70	(years)	
Unit Conversion Factor		1.00E-06	(kg/mg)	

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
CARCINOGENIC ASSESSMENT FOR OUTDOOR MAINTENANCE WORKER (GROUNDSKEEPER)
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

		Compound Parameters				Average Daily Dose (mg/kg-day)		Potential Excess Lifetime Cancer Risk		
		Concentration In Surface Turf (a)	Dermal - Soil Absorption Adjustment	Oral Cancer Slope Factor	Dermal Cancer Slope Factor	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Total
Compound	CAS	(mg/kg)	Factor	$(mg/kg\text{-}day)^{-1}$	$(mg/kg\text{-}day)^{-1}$	Groundskeeper	Groundskeeper	Groundskeeper	Groundskeeper	Groundskeeper
Total PCB Aroclors (High Risk)	RACALC-PCB-HighRisk	2.60E+00	1.40E-01	2.00E+00	2.00E+00	4.77E-07	4.41E-07	9.54E-07	8.82E-07	1.84E-06
Total PCB Aroclors (Low Risk)	RACALC-PCB-LowRisk	2.60E+00	1.40E-01	4.00E-01	4.00E-01	4.77E-07	4.41E-07	1.91E-07	1.76E-07	3.67E-07

Notes:
CAS - Chemical Abstracts Service.
mg/kg - Milligrams per Kilogram.
PCB - Polychlorinated biphenyl.
(a) Concentration in surface turf is the maximum detected Total PCB Aroclor concentration from the turf grass/mat and crumb rubber samples collected in April 2018.

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
NONCARCINOGENIC ASSESSMENT FOR OUTDOOR MAINTENANCE WORKER (GROUNDSKEEPER)
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

Receptors Evaluated:	
Receptor 1:	Groundskeeper

Pathways Evaluated:	
Media:	Surface Turf
Pathway 1:	Incidental Ingestion
Pathway 2:	Dermal Contact

Parameter	Receptor	Assumed Value	Units	Calculated Value
Soil Ingestion Rate	Groundskeeper	100	(mg soil/day)	
Adherence Factor	Groundskeeper	0.2	(mg/cm^2)	
Skin Exposed	Groundskeeper	3300	(cm^2)	
Body Weight	Groundskeeper	80	(kg)	
Exposure Frequency	Groundskeeper	150	(days)/365(days) =	4.11E-01
Exposure Duration (noncancer)	Groundskeeper	25	(years)/25(years) =	1.00E+00
Unit Conversion Factor		1.00E-06	(kg/mg)	

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
NONCARCINOGENIC ASSESSMENT FOR OUTDOOR MAINTENANCE WORKER (GROUNDSKEEPER)
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

		Compound Parameters				Average Daily Dose			Potential Hazard Index		
Compound	CAS	Concentration In Surface Turf (a) (mg/kg)	Dermal - Soil Absorption Adjustment Factor	Oral Reference Dose (mg/kg-day)	Dermal Reference Dose (mg/kg-day)	Ingestion (mg/kg-day)	Dermal Contact (mg/kg-day)	Total (mg/kg-day)	Ingestion	Dermal Contact	Total
Total PCB Aroclors	RACALC-PCB	2.60E+00	1.40E-01	2.00E-05	2.00E-05	1.34E-06	1.23E-06	2.57E-06	6.68E-02	6.17E-02	1.28E-01

Notes:
CAS - Chemical Abstracts Service.
mg/kg - Milligrams per Kilogram.
PCB - Polychlorinated biphenyl.
(a) Concentration in surface turf is the maximum detected Total PCB Aroclor concentration from the turf grass/mat and crumb rubber samples collected in April 2018.

Construction/Utility Worker

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
CARCINOGENIC ASSESSMENT FOR CONSTRUCTION/UTILITY WORKER
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

Receptors Evaluated:	
Receptor 1:	Construction/Utility Worker

Pathways Evaluated:	
Media:	Surface Turf
Pathway 1:	Incidental Ingestion
Pathway 2:	Dermal Contact

Parameter	Receptor	Assumed Value	Units	Calculated Value
Soil Ingestion Rate	Construction/Utility Worker	330	(mg soil/day)	
Adherence Factor	Construction/Utility Worker	0.3	(mg/cm^2)	
Skin Exposed	Construction/Utility Worker	3300	(cm^2)	
Body Weight	Construction/Utility Worker	80	(kg)	
Exposure Frequency	Construction/Utility Worker	130	(days)/365(days) =	3.56E-01
Exposure Duration	Construction/Utility Worker	1	(years)/70(years) =	1.43E-02
Lifetime		70	(years)	
Unit Conversion Factor		1.00E-06	(kg/mg)	

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
CARCINOGENIC ASSESSMENT FOR CONSTRUCTION/UTILITY WORKER
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

		Compound Parameters				Average Daily Dose (mg/kg-day)		Potential Excess Lifetime Cancer Risk		
		Concentration In Surface Turf (a)	Dermal - Soil Absorption Adjustment	Oral Cancer Slope Factor	Dermal Cancer Slope Factor	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Total
Compound	CAS	(mg/kg)	Factor	$(mg/kg\text{-}day)^{-1}$	$(mg/kg\text{-}day)^{-1}$	Construction/Utility Worker	Construction/Utility Worker	Construction/Utility Worker	Construction/Utility Worker	Construction/Utility Worker
Total PCB Aroclors (High Risk)	RACALC-PCB-HighRisk	2.60E+00	1.40E-01	2.00E+00	2.00E+00	5.46E-08	2.29E-08	1.09E-07	4.58E-08	1.55E-07
Total PCB Aroclors (Low Risk)	RACALC-PCB-LowRisk	2.60E+00	1.40E-01	4.00E-01	4.00E-01	5.46E-08	2.29E-08	2.18E-08	9.17E-09	3.10E-08

Notes:
CAS - Chemical Abstracts Service.
mg/kg - Milligrams per Kilogram.
PCB - Polychlorinated biphenyl.
(a) Concentration in surface turf is the maximum detected Total PCB Aroclor concentration from the turf grass/mat and crumb rubber samples collected in April 2018.

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
NONCARCINOGENIC ASSESSMENT FOR CONSTRUCTION/UTILITY WORKER
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

Receptors Evaluated:	
Receptor 1:	Construction/Utility Worker

Pathways Evaluated:	
Media:	Surface Turf
Pathway 1:	Incidental Ingestion
Pathway 2:	Dermal Contact

Parameter	Receptor	Assumed Value	Units	Calculated Value
Soil Ingestion Rate	Construction/Utility Worker	330	(mg soil/day)	
Adherence Factor	Construction/Utility Worker	0.3	(mg/cm^2)	
Skin Exposed	Construction/Utility Worker	3300	(cm^2)	
Body Weight	Construction/Utility Worker	80	(kg)	
Exposure Frequency	Construction/Utility Worker	130	(days)/365(days) =	3.56E-01
Exposure Duration (noncancer)	Construction/Utility Worker	1	(years)/1(years) =	1.00E+00
Unit Conversion Factor		1.00E-06	(kg/mg)	

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
NONCARCINOGENIC ASSESSMENT FOR CONSTRUCTION/UTILITY WORKER
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

		Compound Parameters				Average Daily Dose - Construction/Utility Worker			Potential Hazard Index - Construction/Utility Worker		
Compound	CAS	Concentration In Surface Turf (a) (mg/kg)	Dermal - Soil Absorption Adjustment Factor	Oral Reference Dose (mg/kg-day)	Dermal Reference Dose (mg/kg-day)	Ingestion (mg/kg-day)	Dermal Contact (mg/kg-day)	Total (mg/kg-day)	Ingestion	Dermal Contact	Total
Total PCB Aroclors	RACALC-PCB	2.60E+00	1.40E-01	2.00E-05	2.00E-05	3.82E-06	1.60E-06	5.42E-06	1.91E-01	8.02E-02	2.71E-01

Notes:
CAS - Chemical Abstracts Service.
mg/kg - Milligrams per Kilogram.
PCB - Polychlorinated biphenyl.
(a) Concentration in surface turf is the maximum detected Total PCB Aroclor concentration from the turf grass/mat and crumb rubber samples collected in April 2018.

Student (Outdoor Athlete)

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
CARCINOGENIC ASSESSMENT FOR STUDENT (OUTDOOR ATHLETE)
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

Receptors Evaluated:	
Receptor 1:	Student (Outdoor Athlete)

Pathways Evaluated:	
Media:	Surface Turf
Pathway 1:	Incidental Ingestion
Pathway 2:	Dermal Contact

Parameter	Receptor	Assumed Value	Units	Calculated Value
Soil Ingestion Rate	Student (Outdoor Athlete)	100	(mg soil/day)	
Adherence Factor	Student (Outdoor Athlete)	0.3	(mg/cm^2)	
Skin Exposed	Student (Outdoor Athlete)	3989	(cm^2)	
Body Weight	Student (Outdoor Athlete)	64	(kg)	
Exposure Frequency	Student (Outdoor Athlete)	120	(days)/365(days) =	3.29E-01
Exposure Duration	Student (Outdoor Athlete)	4	(years)/70(years) =	5.71E-02
Lifetime		70	(years)	
Unit Conversion Factor		1.00E-06	(kg/mg)	

Age-Dependant Adjustment Factors (ADAFs)		
Age Group	Potentially Mutagenic	Non-Mutagenic
Student (14-17 yrs)	3	1

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
CARCINOGENIC ASSESSMENT FOR STUDENT (OUTDOOR ATHLETE)
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

		Compound Parameters					Average Daily Dose (mg/kg-day)		Potential Excess Lifetime Cancer Risk		
		Concentration In Surface Turf (a)	Dermal - Soil Absorption Adjustment	Oral Cancer Slope Factor	Dermal Cancer Slope Factor		Ingestion	Dermal Contact	Ingestion	Dermal Contact	Total
Compound	CAS	(mg/kg)	Factor	$(mg/kg\text{-}day)^{-1}$	$(mg/kg\text{-}day)^{-1}$	Potentially Mutagenic?	Student (Outdoor Athlete)	Student (Outdoor Athlete)	Student (Outdoor Athlete)	Student (Outdoor Athlete)	Student (Outdoor Athlete)
Total PCB Aroclors (High Risk)	RACALC-PCB-HighRisk	2.60E+00	1.40E-01	2.00E+00	2.00E+00	No	7.63E-08	1.28E-07	1.53E-07	2.56E-07	4.08E-07
Total PCB Aroclors (Low Risk)	RACALC-PCB-LowRisk	2.60E+00	1.40E-01	4.00E-01	4.00E-01	No	7.63E-08	1.28E-07	3.05E-08	5.11E-08	8.17E-08

Notes:
CAS - Chemical Abstracts Service.
mg/kg - Milligrams per Kilogram.
PCB - Polychlorinated biphenyl.
(a) Concentration in surface turf is the maximum detected Total PCB Aroclor concentration from the turf grass/mat and crumb rubber samples collected in April 2018.

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
NONCARCINOGENIC ASSESSMENT FOR STUDENT (OUTDOOR ATHLETE)
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

Receptors Evaluated:	
Receptor 1:	Student (Outdoor Athlete)

Pathways Evaluated:	
Media:	Surface Turf
Pathway 1:	Incidental Ingestion
Pathway 2:	Dermal Contact

Parameter	Receptor	Assumed Value	Units	Calculated Value
Soil Ingestion Rate	Student (Outdoor Athlete)	100	(mg soil/day)	
Adherence Factor	Student (Outdoor Athlete)	0.3	(mg/cm^2)	
Skin Exposed	Student (Outdoor Athlete)	3989	(cm^2)	
Body Weight	Student (Outdoor Athlete)	64	(kg)	
Exposure Frequency	Student (Outdoor Athlete)	120	(days)/365(days) =	3.29E-01
Exposure Duration (noncancer)	Student (Outdoor Athlete)	4	(years)/4(years) =	1.00E+00
Unit Conversion Factor		1.00E-06	(kg/mg)	

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
NONCARCINOGENIC ASSESSMENT FOR STUDENT (OUTDOOR ATHLETE)
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

		Compound Parameters			Average Daily Dose - Student (Outdoor Athlete)			Potential Hazard Index - Student (Outdoor Athlete)		
Compound	CAS	Concentration In Surface Turf (a) (mg/kg)	Dermal - Soil Absorption Adjustment Factor	Dermal Reference Dose (mg/kg-day)	Ingestion (mg/kg-day)	Dermal Contact (mg/kg-day)	Total (mg/kg-day)	Ingestion	Dermal Contact	Total
Total PCB Aroclors	RACALC-PCB	2.60E+00	1.40E-01	2.00E-05	1.34E-06	2.24E-06	3.57E-06	6.68E-02	1.12E-01	1.79E-01

Notes:
CAS - Chemical Abstracts Service.
mg/kg - Milligrams per Kilogram.
PCB - Polychlorinated biphenyl.
(a) Concentration in surface turf is the maximum detected Total PCB Aroclor concentration from the turf grass/mat and crumb rubber samples collected in April 2018.

Teacher (Coach of Outdoor Sport)

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
CARCINOGENIC ASSESSMENT FOR TEACHER (COACH OF OUTDOOR SPORT)
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

Receptors Evaluated:	
Receptor 1:	Teacher (Coach of Outdoor Sport)

Pathways Evaluated:	
Media:	Surface Turf
Pathway 1:	Incidental Ingestion
Pathway 2:	Dermal Contact

Parameter	Receptor	Assumed Value	Units	Calculated Value
Soil Ingestion Rate	Teacher (Coach of Outdoor Sport)	100	(mg soil/day)	
Adherence Factor	Teacher (Coach of Outdoor Sport)	0.07	(mg/cm^2)	
Skin Exposed	Teacher (Coach of Outdoor Sport)	4782	(cm^2)	
Body Weight	Teacher (Coach of Outdoor Sport)	80	(kg)	
Exposure Frequency	Teacher (Coach of Outdoor Sport)	60	(days)/365(days) =	1.64E-01
Exposure Duration	Teacher (Coach of Outdoor Sport)	25	(years)/70(years) =	3.57E-01
Lifetime		70	(years)	
Unit Conversion Factor		1.00E-06	(kg/mg)	

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
CARCINOGENIC ASSESSMENT FOR TEACHER (COACH OF OUTDOOR SPORT)
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

		Compound Parameters				Average Daily Dose (mg/kg-day)		Potential Excess Lifetime Cancer Risk		
		Concentration In Surface Turf (a)	Dermal - Soil Absorption Adjustment	Oral Cancer Slope Factor	Dermal Cancer Slope Factor	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Total
Compound	CAS	(mg/kg)	Factor	$(mg/kg\text{-}day)^{-1}$	$(mg/kg\text{-}day)^{-1}$	Teacher (Coach of Outdoor Sport)	Teacher (Coach of Outdoor Sport)	Teacher (Coach of Outdoor Sport)	Teacher (Coach of Outdoor Sport)	Teacher (Coach of Outdoor Sport)
Total PCB Aroclors (High Risk)	RACALC-PCB-HighRisk	2.60E+00	1.40E-01	2.00E+00	2.00E+00	1.91E-07	8.94E-08	3.82E-07	1.79E-07	5.60E-07
Total PCB Aroclors (Low Risk)	RACALC-PCB-LowRisk	2.60E+00	1.40E-01	4.00E-01	4.00E-01	1.91E-07	8.94E-08	7.63E-08	3.58E-08	1.12E-07

Notes:
CAS - Chemical Abstracts Service.
mg/kg - Milligrams per Kilogram.
PCB - Polychlorinated biphenyl.
(a) Concentration in surface turf is the maximum detected Total PCB Aroclor concentration from the turf grass/mat and crumb rubber samples collected in April 2018.

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
NONCARCINOGENIC ASSESSMENT FOR TEACHER (COACH OF OUTDOOR SPORT)
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

Receptors Evaluated:	
Receptor 1:	Teacher (Coach of Outdoor Sport)

Pathways Evaluated:	
Media:	Surface Turf
Pathway 1:	Incidental Ingestion
Pathway 2:	Dermal Contact

Parameter	Receptor	Assumed Value	Units	Calculated Value
Soil Ingestion Rate	Teacher (Coach of Outdoor Sport)	100	(mg soil/day)	
Adherence Factor	Teacher (Coach of Outdoor Sport)	0.07	(mg/cm^2)	
Skin Exposed	Teacher (Coach of Outdoor Sport)	4782	(cm^2)	
Body Weight	Teacher (Coach of Outdoor Sport)	80	(kg)	
Exposure Frequency	Teacher (Coach of Outdoor Sport)	60	(days)/365(days) =	1.64E-01
Exposure Duration (noncancer)	Teacher (Coach of Outdoor Sport)	25	(years)/25(years) =	1.00E+00
Unit Conversion Factor		1.00E-06	(kg/mg)	

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
NONCARCINOGENIC ASSESSMENT FOR TEACHER (COACH OF OUTDOOR SPORT)
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

		Compound Parameters				Average Daily Dose - Teacher (Coach of Outdoor Sport)			Potential Hazard Index - Teacher (Coach of Outdoor Sport)		
Compound	CAS	Concentration In Surface Turf (a) (mg/kg)	Dermal - Soil Absorption Adjustment Factor	Oral Reference Dose (mg/kg-day)	Dermal Reference Dose (mg/kg-day)	Ingestion (mg/kg-day)	Dermal Contact (mg/kg-day)	Total (mg/kg-day)	Ingestion	Dermal Contact	Total
Total PCB Aroclors	RACALC-PCB	2.60E+00	1.40E-01	2.00E-05	2.00E-05	5.34E-07	2.50E-07	7.85E-07	2.67E-02	1.25E-02	3.92E-02

Notes:
CAS - Chemical Abstracts Service.
mg/kg - Milligrams per Kilogram.
PCB - Polychlorinated biphenyl.
(a) Concentration in surface turf is the maximum detected Total PCB Aroclor concentration from the turf grass/mat and crumb rubber samples collected in April 2018.

Site Visitor/Spectator

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
CARCINOGENIC ASSESSMENT FOR SITE VISITOR/SPECTATOR
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

Receptors Evaluated:	
Receptor 1:	Young Child (0-2 yrs)
Receptor 2:	Older Child (2-8 yrs)
Receptor 3:	Adult

Pathways Evaluated:	
Media:	Surface Turf
Pathway 1:	Incidental Ingestion
Pathway 2:	Dermal Contact

Parameter	Receptor	Assumed Value	Units	Calculated Value
Soil Ingestion Rate	Young Child (0-2 yrs)	200	(mg soil/day)	
Soil Ingestion Rate	Older Child (2-8 yrs)	100	(mg soil/day)	
Soil Ingestion Rate	Adult	100	(mg soil/day)	
Adherence Factor	Young Child (0-2 yrs)	0.2	(mg/cm^2)	
Adherence Factor	Older Child (2-8 yrs)	0.2	(mg/cm^2)	
Adherence Factor	Adult	0.07	(mg/cm^2)	
Skin Exposed	Young Child (0-2 yrs)	1226	(cm^2)	
Skin Exposed	Older Child (2-8 yrs)	900	(cm^2)	
Skin Exposed	Adult	4782	(cm^2)	
Body Weight	Young Child (0-2 yrs)	10	(kg)	
Body Weight	Older Child (2-8 yrs)	20	(kg)	
Body Weight	Adult	80	(kg)	
Exposure Frequency	Young Child (0-2 yrs)	36.2	(days)/365(days) =	9.92E-02
Exposure Frequency	Older Child (2-8 yrs)	36.2	(days)/365(days) =	9.92E-02
Exposure Frequency	Adult	36.2	(days)/365(days) =	9.92E-02
Exposure Duration	Young Child (0-2 yrs)	2	(years)/70(years) =	2.86E-02
Exposure Duration	Older Child (2-8 yrs)	6	(years)/70(years) =	8.57E-02
Exposure Duration	Adult	8	(years)/70(years) =	1.14E-01
Lifetime		70	(years)	
Unit Conversion Factor		1.00E-06	(kg/mg)	

Age-Dependant Adjustment Factors (ADAFs)		
Age Group	Potentially Mutagenic	Non-Mutagenic
Young Child (0-2 yrs)	10	1
Older Child (2-8 yrs)	3	1
Adult	1	1

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
CARCINOGENIC ASSESSMENT FOR SITE VISITOR/SPECTATOR
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

		Compound Parameters					Average Daily Dose (mg/kg-day)							
							Ingestion				Dermal Contact			
Compound	CAS	Concentration In Surface Turf (a) (mg/kg)	Dermal - Soil Absorption Adjustment Factor	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	Dermal Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	Potentially Mutagenic?	Young Child (0-2 yrs)	Older Child (2-8 yrs)	Adult	Lifetime	Young Child (0-2 yrs)	Older Child (2-8 yrs)	Adult	Lifetime
Total PCB Aroclors (High Risk)	RACALC-PCB-HighRisk	2.60E+00	1.40E-01	2.00E+00	2.00E+00	No	1.47E-07	1.11E-07	3.68E-08	2.95E-07	2.53E-08	2.78E-08	1.73E-08	7.04E-08
Total PCB Aroclors (Low Risk)	RACALC-PCB-LowRisk	2.60E+00	1.40E-01	4.00E-01	4.00E-01	No	1.47E-07	1.11E-07	3.68E-08	2.95E-07	2.53E-08	2.78E-08	1.73E-08	7.04E-08

Notes:
CAS - Chemical Abstracts Service.
mg/kg - Milligrams per Kilogram.
yrs - Years.
PCBs - Polychlorinated biphenyls.
(a) Concentration in surface turf is the maximum detected Total PCB Aroclor concentration from the turf grass/mat and crumb rubber samples collected in April 2018.

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
CARCINOGENIC ASSESSMENT FOR SITE VISITOR/SPECTATOR
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

		Potential Excess Lifetime Cancer Risk											
		Ingestion				Dermal Contact				Total			
Compound	CAS	Young Child (0-2 yrs)	Older Child (2-8 yrs)	Adult	Lifetime	Young Child (0-2 yrs)	Older Child (2-8 yrs)	Adult	Lifetime	Young Child (0-2 yrs)	Older Child (2-8 yrs)	Adult	Lifetime
Total PCB Aroclors (High Risk)	RACALC-PCB-HighRisk	2.95E-07	2.21E-07	7.37E-08	5.89E-07	5.06E-08	5.57E-08	3.45E-08	1.41E-07	3.45E-07	2.77E-07	1.08E-07	7.30E-07
Total PCB Aroclors (Low Risk)	RACALC-PCB-LowRisk	5.89E-08	4.42E-08	1.47E-08	1.18E-07	1.01E-08	1.11E-08	6.91E-09	2.82E-08	6.91E-08	5.53E-08	2.16E-08	1.46E-07

Notes:
CAS - Chemical Abstracts Service.
mg/kg - Milligrams per Kilogram.
yrs - Years.
PCBs - Polychlorinated biphenyls.
(a) Concentration in surface turf is the maximum detected Total PCB Aroclor concentration from the turf grass/mat and crumb rubber samples collected in April 2018.

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
NONCARCINOGENIC ASSESSMENT FOR SITE VISITOR/SPECTATOR
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

Receptors Evaluated:	
Receptor 1:	Young Child (0-6 yrs)

Pathways Evaluated:	
Media:	Surface Turf
Pathway 1:	Incidental Ingestion
Pathway 2:	Dermal Contact

Parameter	Receptor	Assumed Value	Units	Calculated Value
Soil Ingestion Rate	Young Child (0-6 yrs)	200	(mg soil/day)	
Adherence Factor	Young Child (0-6 yrs)	0.2	(mg/cm^2)	
Skin Exposed	Young Child (0-6 yrs)	1717	(cm^2)	
Body Weight	Young Child (0-6 yrs)	15	(kg)	
Exposure Frequency	Young Child (0-6 yrs)	36.2	(days)/365(days) =	9.92E-02
Exposure Duration (noncancer)	Young Child (0-6 yrs)	6	(years)/6(years) =	1.00E+00
Unit Conversion Factor		1.00E-06	(kg/mg)	

HUMAN HEALTH RISK ASSESSMENT
GREENWICH HIGH SCHOOL
NONCARCINOGENIC ASSESSMENT FOR SITE VISITOR/SPECTATOR
INGESTION AND DERMAL CONTACT WITH SURFACE TURF

		Compound Parameters				Average Daily Dose - Young Child (0-6 yrs)			Potential Hazard Index - Young Child (0-6 yrs)		
Compound	CAS	Concentration In Surface Turf (a) (mg/kg)	Dermal - Soil Absorption Adjustment Factor	Oral Reference Dose (mg/kg-day)	Dermal Reference Dose (mg/kg-day)	Ingestion (mg/kg-day)	Dermal Contact (mg/kg-day)	Total (mg/kg-day)	Ingestion	Dermal Contact	Total
Total PCB Aroclors	RACALC-PCB	2.60E+00	1.40E-01	2.00E-05	2.00E-05	3.44E-06	8.26E-07	4.26E-06	1.72E-01	4.13E-02	2.13E-01

Notes:
CAS - Chemical Abstracts Service.
mg/kg - Milligrams per Kilogram.
yrs - Years.
PCB - Polychlorinated biphenyl.
(a) Concentration in surface turf is the maximum detected Total PCB Aroclor concentration from the turf grass/mat and crumb rubber samples collected in April 2018.

AECOM
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Rocky Hill, CT 06067
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August 13, 2018

Ms. Kimberly Tisa
Region 1 PCB Coordinator
U.S. Environmental Protection Agency
5 Post Office Square OSRR07-2
Boston, MA 02109-3912

Turf Sampling Data Summary
Greenwich High School
10 Hillside Road
Greenwich, Connecticut
Remediation ID No. 13334

Dear Ms. Tisa,

Pursuant to our discussions regarding the turf sampling data summary letter dated, June 11, 2018, AECOM collected additional samples of the synthetic turf materials and the associated structural fill layer in Fields 3, 4, and 6 at Greenwich High School. Samples were collected at 18 locations, primarily on Fields 3 and 4, where contaminated fill material has been identified beneath the geomembrane on which the field materials, including the structural fill, rest. Sampling locations are shown on the attached figure.

This sampling program included collection of three materials associated with the synthetic turf at each sample location (54 total samples). The materials sampled included:

1. Grass carpet (A layer);
2. Crumb rubber infill material (B layer); and
3. Structural stone fill (E layer).

The polystyrene drainage blanket (C layer) and polyethylene cushion (D layer) were sampled but not analyzed during this sampling event, as the data for those layers were not expected to be necessary to make either long-term or near-term remedial decisions. As noted in our June 11 correspondence, previous sampling identified the presence of PCBs at concentrations greater than one milligram per kilogram (mg/kg) in the crumb rubber at sampling location AJ13. PCB concentrations were less than 1 mg/kg in the grass carpet at this location, were not detected in the drainage blanket or cushion layer, and were greater than 1 mg/kg in the structural stone fill, overlying the geotextile membrane that caps the contaminated fill material. The July sampling program was designed to delineate the impacts at these locations and to evaluate the distribution of PCBs in the turf materials across the fields that overly contaminated fill material.

The results of the July sampling program are summarized in the attached table. Sample identifiers provide the sample grid location and the layer (e.g., AJ15-B is the crumb rubber from sample location AJ15). The July sampling event included 10-foot grid sampling around sample location AJ13 to delineate the impacts detected there previously. Location AJ13 was also resampled in July, and results were consistent with the results of the April sampling performed at that location. The only location where surficial materials (i.e., Layers A and B) were identified to contain PCBs greater than 1 mg/kg was in the crumb rubber layer from sampling location AJ13.

Between the April and July sampling events, PCBs were detected in 16 of the 81 unique samples analyzed (not counting the resampled intervals) including one grass carpet sample (A layer), three crumb rubber samples (B layer), and 12 stone fill samples (E layer) two of the three resampled intervals. Five of the sample locations contained PCB concentrations greater than 1 mg/kg including one crumb rubber infill sample and four stone fill samples. Two of those

results, including the crumb rubber result, are from the AJ13 sampling location, as noted above. Three of the four detections of PCBs at concentrations greater than 1 mg/kg were obtained from the south end of Field 4 (i.e., locations AJ13, AJ13A, and AJ15), and the other such result was obtained in April from the south end of Field 3 (i.e., location AA12). Laboratory analytical reports are included as **Attachment A**.

Based on the results of the turf sampling program, the Town and AECOM believe that a focused interim remedial measure is appropriate at this time to address the PCBs detected at concentrations greater than 1 mg/kg in the crumb rubber at AJ13. The proposed method to address these impacts involves removing a 10 x 10-foot piece of the grass carpet with crumb rubber within it in the area surrounding location AJ13 and disposing of it at a facility approved to receive PCB Waste in accordance with 40 CFR 761.75. Because this is an interim remedial measure, we propose to complete this work without verification sampling at this time, with the understanding that the entire turf carpet will be replaced in the future as part of planned turf field renovations.

Please let us know if you have any questions. We will follow up with you early next week.

Regards,

Patrick Haskell, LEP, CHMM
Technical Leader

Michael Doherty, P.E.
Associate Vice President

Attachments:

Figure 1 Turf Sampling Locations

Table 1 Summary of Turf Sampling Results – July 2018
Table 2 Summary of Turf Sampling Results –April 2018

Attachment A –Laboratory Analytical Reports

cc:
Amy Siebert, Town of Greenwich, Department of Public Works
Daniel Watson, Greenwich Public Schools
Jeffrey Wilcox, CTDEEP
Gary Trombly, CTDEEP
Jane Warren, McCarter & English, LLP

Figure

PROPERTY LINE

EAST PUTNAM AVENUE

F3W (AD9)	
A	ND
B	ND
C	ND
D	ND
E	ND

F4W (AJ10)	
A	ND
B	ND
C	ND
D	ND
E	ND

AG12	2018
A	ND
B	ND
E	ND

AH10	2018
A	ND
D	ND
E	**0.12**

AD11	2018
A	ND
B	ND
E	ND

AJ12	2018
A	ND
B	ND
E	ND

AJ13A	2018
A	ND
B	**0.17**
E	**2.3**

AM13	2018
A	ND
B	ND
E	ND

AJ13	2014	April 2018	July 2018
A	NT	**0.60**	**0.41**
B	NT	**2.6**	**3.2**
C	NT	ND	ND
D	**0.272**	ND	ND
E	**0.0636**	**8.5**	**8.5**

AC9	2018
A	ND
B	ND
E	**0.57**

AA12	2014	2018
A	NT	ND
B	NT	ND
C	NT	ND
D	**0.517**	ND
E	**0.856**	**1.9**

AA10	2018
A	ND
B	ND
E	ND

AP14	2018
A	ND
B	ND
E	**0.61**

AJ13D	2018
A	ND
B	ND
E	ND

AP15	2018
A	ND
B	ND
E	ND

AB13	2018
A	ND
B	ND
E	**0.15**

AD14	2018
A	ND
B	ND
E	ND

AJ13C	2018
A	ND
B	ND
E	**0.367**

AJ13B	2018
A	ND
B	ND
E	**0.6**

AJ15	2018
A	ND
B	ND
E	**2.8**

F4E (AK15)	
A	ND
B	**0.38**
C	ND
D	ND
E	ND

AT20	2018
A	ND
B	ND
E	**0.12**

F3E (AF14)	
A	ND
B	ND
C	ND
D	ND
E	**0.26**

MW-P7 · MW-Y9* · MW-Y9-D* · MW-AE8 · MW-AG10 · MW-AL10 · MW-AP11 · MW-P11 · MW-V12 · MW-AA12* · MW-AA12-D* · MW-AJ13-D* · MW-AJ13* · MW-Y15-D* · MW-Y15* · MW-S15 · MW-X17 · MW-V18 · MW-AA19 · MW-AH16R · MW-AM16-D* · MW-AM16* · MW-AV17 · MW-AJ19 · MW-AM21 · MW-R20 · MW-T23 · MW-AP28 · MW-AG30 · MW-BB34

FIELD #1 (ARTIFICIAL TURF)

FIELD #2 (GRASS)

FIELD #3 (ARTIFICIAL TURF)

FIELD #4 (ARTIFICIAL TURF)

FIELD #5 (GRASS)

FIELD #6 (ARTIFICIAL TURF)

FIELD #7 (ARTIFICIAL TURF)

TENNIS COURTS

POOL

GYM

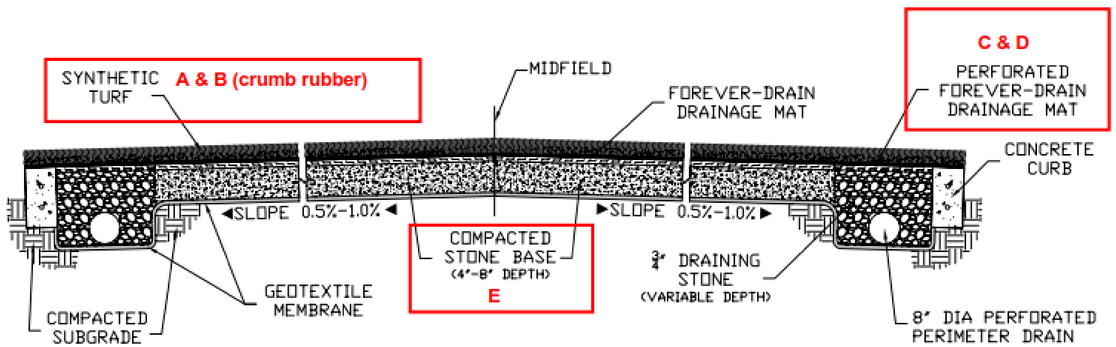
MUSIC INSTRUCTIONAL SPACE AND AUDITORIUM

SCIENCE WING

WEST PARKING LOT

NORTH PARKING LOT

WEST BROTHERS



LEGEND

- AOC 1 Fill Area
- Property Boundary
- Historical Monitoring Well
- 2017 Installed Monitoring Well
- Turf Sample - July 2018
- Turf Sample - April 2018

Legend	
A	Turf Grass / Mat
B	Crumb Rubber
C	Drainage Mat - Dimple Plastic
D	Drainage Mat - Fabric
E	Sub-base
ND	Not Detected
NT	Not Tested

Notes:
2014 Samples collected from existing monitoring well locations
PCB results are reported as total PCBs in mg/kg (ppm)

AECOM Environment
500 ENTERPRISE DR, STE 1A
ROCKY HILL, CT 06067
(860) 263-5800
www.aecom.com

SOURCE:
2010 AERIAL ORTHOPHOTO FROM STATE OF CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION.

SCALE:
1" = 80'
0 40 80 160 240 Feet
SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

FIGURE 1
PROPOSED TURF SAMPLING LOCATIONS

GREENWICH HIGH SCHOOL
10 HILLSIDE ROAD
GREENWICH, CT

JOB 60225155
FILE NO.
CAD FILE
SHEET

Path: \\ukmc05001\data\EVERYONE\60432356 Greenwich High School Remediation\900-Work\GIS\MXDs\Appendix\A_HydroWP_RTC_GRS Well Network_2017.mxd

Tables

Table 1
Summary of Turf Sampling Results - July 2018
Greenwich High School
Greenwich, Connecticut

Sample Location and Layer	Total PCB Concentration (mg/kg)
AA10-A	ND
AA10-B	ND
AA10-E	ND
AB13-A	ND
AB13-B	ND
AB13-E	0.15
AC9-A	ND
AC9-B	ND
AC9-E	0.57
AD11-A	ND
AD11-B	ND
AD11-E	ND
AD14-A	ND
AD14-B	ND
AD14-E	ND
AG12-A	ND
AG12-B	ND
AG12-E	ND
AH10-A	ND
AH10-B	ND
AH10-E	0.12
AJ12-A	ND
AJ12-B	ND
AJ12-E	ND
AJ13R-A	0.41
AJ13R-B	3.2
AJ13R-E	8.5
AJ13A-A	ND
AJ13A-B	0.17
AJ13A-E	2.3
AJ13B-A	ND
AJ13B-B	ND
AJ13B-E	0.6
AJ13C-A	ND
AJ13C-B	ND
AJ13C-E	0.367
AJ13C-A DUP	ND
AJ13C-B DUP	ND
AJ13C-E DUP	0.26
AJ13D-A	ND
AJ13D-B	ND
AJ13D-E	ND
AJ15-A	ND
AJ15-B	ND
AJ15-E	2.8
AM13-A	ND
AM13-B	ND
AM13-E	ND
AP14-A	ND
AP14-B	ND
AP14-E	0.61
AP15-A	ND
AP15-B	ND
AP15-E	ND
AT20-A	ND
AT20-B	ND
AT20-E	0.12

Notes:
Table presents calculated total PCBs on a dry weight basis as determined by
USEPA Method 680 (homologues) for layers A & B and
by USEPA Method 8082 (Aroclors) for layer E.
Detections are presented in bold text.
Green highlighting indicates exceedance of Residential Direct Exposure Criterion.
PCB = Polychlorinated biphenyls
mg/kg = milligrams per kilogram
ND = None detected above laboratory reporting limit
Laboratory reporting limits for for individual homlogues and Aroclors
on ND results show above were all below 0.25 mg/kg
Layer A = Turf grass fabric
Layer B = Crumb rubber infill
Layer E = Strucutral stone fill, directly above geotextile membrane soil cap.

Table 2
Summary of Turf Sampling Results - April 2018
Greenwich High School
Greenwich, Connecticut

Sample Location and Layer	Total PCB Concentration (mg/kg)
AJ13-A	0.77 J
AJ13-B	2.6 J
AJ13-C	< 0.62
AJ13-D	< 1.82
AJ13-E	8.5
F3E-A (AF14-A)	< 0.68
F3E-B (AF14-B)	< 0.092
F3E-C (AF14-C)	< 0.6
F3E-D (AF14-D)	< 1.45
F3E-E (AF14-E)	0.26
F4E-A (AK15-A)	< 0.56
F4E-B (AK15-B)	0.38
F4E-C (AK15-C)	< 0.62
F4E-D (AK15-D)	< 1.20
F4E-E (AK15-E)	< 0.085
F3W-A (AD9-A)	< 0.49
F3W-B (AD9-B)	< 0.093
F3W-C (AD9-C)	< 0.57
F3W-D (AD9-D)	< 1.50
F3W-E (AD9-E)	< 0.088
AA12-A	< 0.56
AA12-B	< 0.092
AA12-C	< 0.59
AA12-D	< 1.52
AA12-E	1.9 J
F4W-A (AJ10-A)	< 0.62
F4W-B (AJ10-B)	< 0.10
F4W-C (AJ10-C)	< 0.62
F4W-D (AJ10-D)	< 1.28
F4W-E (AJ10-E)	< 0.088

Notes:
Table presents calculated total PCBs on a dry weight basis as determined by USEPA Method 8082 (Aroclors).
Detections are presented in bold text.
Green highlighting indicates exceedance of Residential Direct Exposure Criterion.
PCB = Polychlorinated biphenyls
mg/kg = milligrams per kilogram
J = Estimated value
Layer A = Turf grass fabric
Layer B = Crumb rubber infill
Layer C = Polystyrene drainage blanket
Layer D = Polyethylene cushion
Layer E = Strucutral stone fill (directly above geotextile membrane soil cap)

Attachment A – Laboratory Analytical Reports

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

August 1, 2018

Matthew Rood
AECOM Environment - Rocky Hill, CT
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067

Project Location: Greenwich, CT
Client Job Number:
Project Number: 60432356.0800.2,
Laboratory Work Order Number: 18G0509

Enclosed are results of analyses for samples received by the laboratory on July 13, 2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Aaron L. Benoit
Project Manager

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ATTN: Matthew Rood

REPORT DATE: 8/1/2018

PURCHASE ORDER NUMBER: 104017

PROJECT NUMBER: 60432356.0800.2,

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 18G0509

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Greenwich, CT

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
AT20-A-071118-1	18G0509-01	Product/Solid		EPA 680 Modified	
				SM 2540G	
AT20-B-071118-1	18G0509-02	Product/Solid		EPA 680 Modified	
				SM 2540G	
AT20-E-071118-1	18G0509-03	Soil		SM 2540G	
				SW-846 8082A	
AP15-A-071118-1	18G0509-04	Product/Solid		EPA 680 Modified	
				SM 2540G	
AP15-B-071118-1	18G0509-05	Product/Solid		EPA 680 Modified	
				SM 2540G	
AP15-E-071118-1	18G0509-06	Soil		SM 2540G	
				SW-846 8082A	
AJ13R-A-071118-1	18G0509-07	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ13R-B-071118-1	18G0509-08	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ13R-E-071118-1	18G0509-09	Soil		SM 2540G	
				SW-846 8082A	
AJ13B-A-071118-1	18G0509-10	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ13B-B-071118-1	18G0509-11	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ13B-E-071118-1	18G0509-12	Soil		SM 2540G	
				SW-846 8082A	
AJ13D-A-071118-1	18G0509-13	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ13D-B-071118-1	18G0509-14	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ13D-E-071118-1	18G0509-15	Soil		SM 2540G	
				SW-846 8082A	
AH10-A-071118-1	18G0509-16	Product/Solid		EPA 680 Modified	
				SM 2540G	
AH10-B-071118-1	18G0509-17	Product/Solid		EPA 680 Modified	
				SM 2540G	
AH10-E-071118-1	18G0509-18	Soil		SM 2540G	
				SW-846 8082A	
AG12-A-071118-1	18G0509-19	Product/Solid		EPA 680 Modified	
				SM 2540G	
AG12-B-071118-1	18G0509-20	Product/Solid		EPA 680 Modified	
				SM 2540G	

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AECOM Environment - Rocky Hill, CT
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067
ATTN: Matthew Rood

REPORT DATE: 8/1/2018

PURCHASE ORDER NUMBER: 104017

PROJECT NUMBER: 60432356.0800.2,

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 18G0509

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Greenwich, CT

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
AG12-E-071118-1	18G0509-21	Soil		SM 2540G	
				SW-846 8082A	
AJ12-A-071118-1	18G0509-22	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ12-B-071118-1	18G0509-23	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ12-E-071118-1	18G0509-24	Soil		SM 2540G	
				SW-846 8082A	
AJ13A-A-071118-1	18G0509-25	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ13A-B-071118-1	18G0509-26	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ13A-E-071118-1	18G0509-27	Soil		SM 2540G	
				SW-846 8082A	
AP14-A-071118-1	18G0509-28	Product/Solid		EPA 680 Modified	
				SM 2540G	
AP14-B-071118-1	18G0509-29	Product/Solid		EPA 680 Modified	
				SM 2540G	
AP14-E-071118-1	18G0509-30	Soil		SM 2540G	
				SW-846 8082A	
AM13-A-071118-1	18G0509-31	Product/Solid		EPA 680 Modified	
				SM 2540G	
AM13-B-071118-1	18G0509-32	Product/Solid		EPA 680 Modified	
				SM 2540G	
AM13-E-071118-1	18G0509-33	Soil		SM 2540G	
				SW-846 8082A	
AJ15-A-071118-1	18G0509-34	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ15-B-071118-1	18G0509-35	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ15-E-071118-1	18G0509-36	Soil		SM 2540G	
				SW-846 8082A	
AJ13C-A-071118-1	18G0509-37	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ13C-B-071118-1	18G0509-38	Product/Solid		EPA 680 Modified	
				SM 2540G	
AJ13C-E-071118-1	18G0509-39	Soil		SM 2540G	
				SW-846 8082A	
DUP 20180711-A	18G0509-40	Product/Solid		EPA 680 Modified	
				SM 2540G	

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Rocky Hill, CT 06067
ATTN: Matthew Rood

REPORT DATE: 8/1/2018

PURCHASE ORDER NUMBER: 104017

PROJECT NUMBER: 60432356.0800.2,

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 18G0509

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Greenwich, CT

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
DUP 20180711-B	18G0509-41	Product/Solid		EPA 680 Modified	
				SM 2540G	
DUP 20180711-E	18G0509-42	Soil		SM 2540G	
				SW-846 8082A	
AC9-A-071218-1	18G0509-43	Product/Solid		EPA 680 Modified	
				SM 2540G	
AC9-B-071218-1	18G0509-44	Product/Solid		EPA 680 Modified	
				SM 2540G	
AC9-E-071218-1	18G0509-45	Soil		SM 2540G	
				SW-846 8082A	
AA10-A-071218-1	18G0509-46	Product/Solid		EPA 680 Modified	
				SM 2540G	
AA10-B-071218-1	18G0509-47	Product/Solid		EPA 680 Modified	
				SM 2540G	
AA10-E-071218-1	18G0509-48	Soil		SM 2540G	
				SW-846 8082A	
AD11-A-071218-1	18G0509-49	Product/Solid		EPA 680 Modified	
				SM 2540G	
AD11-B-071218-1	18G0509-50	Product/Solid		EPA 680 Modified	
				SM 2540G	
AD11-E-071218-1	18G0509-51	Soil		SM 2540G	
				SW-846 8082A	
AB13-A-071218-1	18G0509-52	Product/Solid		EPA 680 Modified	
				SM 2540G	
AB13-B-071218-1	18G0509-53	Product/Solid		EPA 680 Modified	
				SM 2540G	
AB13-E-071218-1	18G0509-54	Soil		SM 2540G	
				SW-846 8082A	
AD14-A-071218-1	18G0509-55	Product/Solid		EPA 680 Modified	
				SM 2540G	
AD14-B-071218-1	18G0509-56	Product/Solid		EPA 680 Modified	
				SM 2540G	
AD14-E-071218-1	18G0509-57	Soil		SM 2540G	
				SW-846 8082A	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

REVISED REPORT 08/01/2018: Report revised to corredct client sample IDs 18G0509-04 through 18G0509-06 per client COC.

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EPA 680 Modified

Qualifications:

H-04

Initial analysis within holding time. Reanalysis for the required dilution was past holding time.

Analyte & Samples(s) Qualified:

Chrysene-d12
18G0509-49RE1[AD11-A-071218-1]

Decachlorobiphenyl
18G0509-49RE1[AD11-A-071218-1]

Dichlorobiphenyls
18G0509-49RE1[AD11-A-071218-1]

Heptachlorobiphenyls
18G0509-49RE1[AD11-A-071218-1]

Hexachlorobiphenyls
18G0509-49RE1[AD11-A-071218-1]

Monochlorobiphenyls
18G0509-49RE1[AD11-A-071218-1]

Nonachlorobiphenyls
18G0509-49RE1[AD11-A-071218-1]

Octachlorobiphenyls
18G0509-49RE1[AD11-A-071218-1]

Pentachlorobiphenyls
18G0509-49RE1[AD11-A-071218-1]

Phenanthrene-d10
18G0509-49RE1[AD11-A-071218-1]

Tetrachlorobiphenyls
18G0509-49RE1[AD11-A-071218-1]

Tetrachloro-m-xylene
18G0509-49RE1[AD11-A-071218-1]

Total Polychlorinated biphenyls
18G0509-49RE1[AD11-A-071218-1]

Trichlorobiphenyls
18G0509-49RE1[AD11-A-071218-1]

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RL-12

Elevated reporting limit due to matrix interference.

Analyte & Samples(s) Qualified:

18G0509-01[AT20-A-071118-1], 18G0509-02[AT20-B-071118-1], 18G0509-04[AP15-A-071118-1], 18G0509-05[AP15-B-071118-1], 18G0509-07[AJ13R-A-071118-1], 18G0509-08[AJ13R-B-071118-1], 18G0509-10[AJ13B-A-071118-1], 18G0509-11[AJ13B-B-071118-1], 18G0509-13[AJ13D-A-071118-1], 18G0509-14[AJ13D-B-071118-1], 18G0509-16[AH10-A-071118-1], 18G0509-17[AH10-B-071118-1], 18G0509-19[AG12-A-071118-1], 18G0509-20[AG12-B-071118-1], 18G0509-22[AJ12-A-071118-1], 18G0509-23[AJ12-B-071118-1], 18G0509-25[AJ13A-A-071118-1], 18G0509-26[AJ13A-B-071118-1], 18G0509-28[AP14-A-071118-1], 18G0509-29[AP14-B-071118-1], 18G0509-32[AM13-B-071118-1], 18G0509-34[AJ15-A-071118-1], 18G0509-35[AJ15-B-071118-1], 18G0509-37[AJ13C-A-071118-1], 18G0509-38[AJ13C-B-071118-1], 18G0509-40[DUP 20180711-A], 18G0509-41[DUP 20180711-B], 18G0509-43[AC9-A-071218-1], 18G0509-44[AC9-B-071218-1], 18G0509-46[AA10-A-071218-1], 18G0509-47[AA10-B-071218-1], 18G0509-49RE1[AD11-A-071218-1], 18G0509-50[AD11-B-071218-1], 18G0509-52[AB13-A-071218-1], 18G0509-53[AB13-B-071218-1], 18G0509-55[AD14-A-071218-1], 18G0509-56[AD14-B-071218-1]

Chrysene-d12
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Decachlorobiphenyl
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Dichlorobiphenyls
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Heptachlorobiphenyls
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Hexachlorobiphenyls
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Monochlorobiphenyls
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Nonachlorobiphenyls
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Octachlorobiphenyls
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Pentachlorobiphenyls
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Phenanthrene-d10
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Tetrachlorobiphenyls
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Tetrachloro-m-xylene
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Total Polychlorinated biphenyls
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

Trichlorobiphenyls
18G0509-31[AM13-A-071118-1], 18G0509-49[AD11-A-071218-1]

S-03

Surrogate recovery outside of control limits due to suspected sample matrix interference.

Analyte & Samples(s) Qualified:

Tetrachloro-m-xylene
18G0509-08[AJ13R-B-071118-1]

S-10

Sample was re-extracted outside of holding time since surrogate standard recovery was outside of control limits. Data from analysis performed outside of holding time is also reported since surrogate recovery is acceptable.

Analyte & Samples(s) Qualified:

Tetrachloro-m-xylene
18G0509-49[AD11-A-071218-1]

S-17

Surrogate recovery is outside of control limits. Data validation is not affected since all associated results are less than the reporting limit and bias is on the high side.

Analyte & Samples(s) Qualified:

Tetrachloro-m-xylene
18G0509-05[AP15-B-071118-1], 18G0509-11[AJ13B-B-071118-1], 18G0509-14[AJ13D-B-071118-1], 18G0509-19[AG12-A-071118-1], 18G0509-20[AG12-B-071118-1], 18G0509-28[AP14-A-071118-1], 18G0509-44[AC9-B-071218-1]

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V-05

Continuing calibration did not meet method specifications and was biased on the low side for this compound. Reported result is estimated.

Analyte & Samples(s) Qualified:

Monochlorobiphenyls
18G0509-41[DUP 20180711-B], 18G0509-43[AC9-A-071218-1], 18G0509-44[AC9-B-071218-1], 18G0509-46[AA10-A-071218-1], 18G0509-52[AB13-A-071218-1], S025616-CCV1

V-06

Continuing calibration did not meet method specifications and was biased on the high side for this compound. Reported result is estimated.

Analyte & Samples(s) Qualified:

Decachlorobiphenyl
B208020-BS1, B208020-BSD1, S025616-CCV2

Heptachlorobiphenyls
B208020-BS1, B208020-BSD1, B208876-BS1, B208876-BSD1, S025762-CCV2

Hexachlorobiphenyls
B208020-BS1, B208020-BSD1, B208876-BS1, B208876-BSD1, S025762-CCV2

Nonachlorobiphenyls
B208020-BS1, B208020-BSD1, S025616-CCV2

Octachlorobiphenyls
B208020-BS1, B208020-BSD1, B208876-BS1, B208876-BSD1, S025762-CCV2

Pentachlorobiphenyls
B208020-BS1, B208020-BSD1

Tetrachlorobiphenyls
B208876-BS1, B208876-BSD1, S025762-CCV2

V-20

Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

Decachlorobiphenyl
18G0509-29[AP14-B-071118-1], 18G0509-31[AM13-A-071118-1], 18G0509-32[AM13-B-071118-1], 18G0509-34[AJ15-A-071118-1], 18G0509-35[AJ15-B-071118-1], 18G0509-37[AJ13C-A-071118-1], 18G0509-38[AJ13C-B-071118-1], 18G0509-40[DUP 20180711-A], 18G0509-41[DUP 20180711-B], 18G0509-43[AC9-A-071218-1], 18G0509-44[AC9-B-071218-1], 18G0509-46[AA10-A-071218-1], 18G0509-52[AB13-A-071218-1], B208020-BLK1

Heptachlorobiphenyls
18G0509-29[AP14-B-071118-1], 18G0509-31[AM13-A-071118-1], 18G0509-32[AM13-B-071118-1], 18G0509-34[AJ15-A-071118-1], 18G0509-35[AJ15-B-071118-1], 18G0509-37[AJ13C-A-071118-1], 18G0509-38[AJ13C-B-071118-1], 18G0509-40[DUP 20180711-A], 18G0509-49RE1[AD11-A-071218-1], B208020-BLK1, B208876-BLK1

Hexachlorobiphenyls
18G0509-29[AP14-B-071118-1], 18G0509-31[AM13-A-071118-1], 18G0509-32[AM13-B-071118-1], 18G0509-34[AJ15-A-071118-1], 18G0509-35[AJ15-B-071118-1], 18G0509-37[AJ13C-A-071118-1], 18G0509-38[AJ13C-B-071118-1], 18G0509-40[DUP 20180711-A], 18G0509-49RE1[AD11-A-071218-1], B208020-BLK1, B208876-BLK1

Nonachlorobiphenyls
18G0509-29[AP14-B-071118-1], 18G0509-31[AM13-A-071118-1], 18G0509-32[AM13-B-071118-1], 18G0509-34[AJ15-A-071118-1], 18G0509-35[AJ15-B-071118-1], 18G0509-37[AJ13C-A-071118-1], 18G0509-38[AJ13C-B-071118-1], 18G0509-40[DUP 20180711-A], 18G0509-41[DUP 20180711-B], 18G0509-43[AC9-A-071218-1], 18G0509-44[AC9-B-071218-1], 18G0509-46[AA10-A-071218-1], 18G0509-52[AB13-A-071218-1], B208020-BLK1

Octachlorobiphenyls
18G0509-29[AP14-B-071118-1], 18G0509-31[AM13-A-071118-1], 18G0509-32[AM13-B-071118-1], 18G0509-34[AJ15-A-071118-1], 18G0509-35[AJ15-B-071118-1], 18G0509-37[AJ13C-A-071118-1], 18G0509-38[AJ13C-B-071118-1], 18G0509-40[DUP 20180711-A], 18G0509-49RE1[AD11-A-071218-1], B208020-BLK1, B208876-BLK1

Pentachlorobiphenyls
18G0509-29[AP14-B-071118-1], 18G0509-31[AM13-A-071118-1], 18G0509-32[AM13-B-071118-1], 18G0509-34[AJ15-A-071118-1], 18G0509-35[AJ15-B-071118-1], 18G0509-37[AJ13C-A-071118-1], 18G0509-38[AJ13C-B-071118-1], 18G0509-40[DUP 20180711-A], B208020-BLK1

Tetrachlorobiphenyls
18G0509-49RE1[AD11-A-071218-1], B208876-BLK1

SW-846 8082A

Qualifications:

P-01

Result was confirmed using a dissimilar column. Relative percent difference between the two results was >40%. In accordance with the method, the higher result was reported.

Analyte & Samples(s) Qualified:

Aroclor-1242 [2C]
18G0509-18[AH10-E-071118-1], 18G0509-36[AJ15-E-071118-1]

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S-01

The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

Analyte & Samples(s) Qualified:

Decachlorobiphenyl
18G0509-09[AJ13R-E-071118-1]

Decachlorobiphenyl [2C]
18G0509-09[AJ13R-E-071118-1]

Tetrachloro-m-xylene
18G0509-09[AJ13R-E-071118-1]

Tetrachloro-m-xylene [2C]
18G0509-09[AJ13R-E-071118-1]

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Aaron L. Benoit
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AT20-A-071118-1 | Sampled: 7/11/2018 09:30

Sample ID: 18G0509-01

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:06	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:06	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:06	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:06	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:06	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:06	IMR
Heptachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:06	IMR
Octachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:06	IMR
Nonachlorobiphenyls	ND	60	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:06	IMR
Decachlorobiphenyl	ND	60	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:06	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:06	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	87.8	50-125				7/25/18 0:06	

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AT20-A-071118-1 | Sampled: 7/11/2018 09:30

Sample ID: 18G0509-01

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	97.7		% Wt	1		SM 2540G	7/17/18	7/18/18 14:22	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AT20-B-071118-1 | Sampled: 7/11/2018 09:29

Sample ID: 18G0509-02

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	9.1	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:44	IMR
Dichlorobiphenyls	ND	9.1	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:44	IMR
Trichlorobiphenyls	ND	9.1	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:44	IMR
Tetrachlorobiphenyls	ND	18	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:44	IMR
Pentachlorobiphenyls	ND	18	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:44	IMR
Hexachlorobiphenyls	ND	18	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:44	IMR
Heptachlorobiphenyls	ND	27	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:44	IMR
Octachlorobiphenyls	ND	27	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:44	IMR
Nonachlorobiphenyls	ND	45	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:44	IMR
Decachlorobiphenyl	ND	45	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:44	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 0:44	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	107	50-125				7/25/18 0:44	

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AT20-B-071118-1 | Sampled: 7/11/2018 09:29

Sample ID: 18G0509-02

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	98.7		% Wt	1		SM 2540G	7/17/18	7/18/18 14:22	JFC

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AT20-E-071118-1 | Sampled: 7/11/2018 09:34

Sample ID: 18G0509-03

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.084	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:27	KAL
Aroclor-1221 [1]	ND	0.084	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:27	KAL
Aroclor-1232 [1]	ND	0.084	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:27	KAL
Aroclor-1242 [1]	ND	0.084	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:27	KAL
Aroclor-1248 [2]	0.12	0.084	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:27	KAL
Aroclor-1254 [1]	ND	0.084	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:27	KAL
Aroclor-1260 [1]	ND	0.084	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:27	KAL
Aroclor-1262 [1]	ND	0.084	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:27	KAL
Aroclor-1268 [1]	ND	0.084	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:27	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	79.8	30-150		7/20/18 15:27
Decachlorobiphenyl [2]	84.0	30-150		7/20/18 15:27
Tetrachloro-m-xylene [1]	83.2	30-150		7/20/18 15:27
Tetrachloro-m-xylene [2]	85.5	30-150		7/20/18 15:27

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AT20-E-071118-1 | Sampled: 7/11/2018 09:34

Sample ID: 18G0509-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.2		% Wt	1		SM 2540G	7/17/18	7/18/18 14:22	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AP15-A-071118-1 | Sampled: 7/11/2018 09:50

Sample ID: 18G0509-04

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:21	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:21	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:21	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:21	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:21	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:21	IMR
Heptachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:21	IMR
Octachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:21	IMR
Nonachlorobiphenyls	ND	60	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:21	IMR
Decachlorobiphenyl	ND	60	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:21	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:21	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	70.5	50-125				7/25/18 1:21	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AP15-A-071118-1 | Sampled: 7/11/2018 09:50

Sample ID: 18G0509-04

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	79.0		% Wt	1		SM 2540G	7/17/18	7/18/18 14:22	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AP15-B-071118-1 | Sampled: 7/11/2018 09:53

Sample ID: 18G0509-05

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	10	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:59	IMR
Dichlorobiphenyls	ND	10	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:59	IMR
Trichlorobiphenyls	ND	10	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:59	IMR
Tetrachlorobiphenyls	ND	21	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:59	IMR
Pentachlorobiphenyls	ND	21	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:59	IMR
Hexachlorobiphenyls	ND	21	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:59	IMR
Heptachlorobiphenyls	ND	31	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:59	IMR
Octachlorobiphenyls	ND	31	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:59	IMR
Nonachlorobiphenyls	ND	52	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:59	IMR
Decachlorobiphenyl	ND	52	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:59	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 1:59	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Tetrachloro-m-xylene	**143** *	50-125	S-17	7/25/18 1:59	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AP15-B-071118-1 | Sampled: 7/11/2018 09:53

Sample ID: 18G0509-05

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	98.0		% Wt	1		SM 2540G	7/17/18	7/18/18 14:22	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AP15-E-071118-1 | Sampled: 7/11/2018 09:55

Sample ID: 18G0509-06

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.090	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:44	KAL
Aroclor-1221 [1]	ND	0.090	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:44	KAL
Aroclor-1232 [1]	ND	0.090	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:44	KAL
Aroclor-1242 [1]	ND	0.090	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:44	KAL
Aroclor-1248 [1]	ND	0.090	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:44	KAL
Aroclor-1254 [1]	ND	0.090	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:44	KAL
Aroclor-1260 [1]	ND	0.090	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:44	KAL
Aroclor-1262 [1]	ND	0.090	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:44	KAL
Aroclor-1268 [1]	ND	0.090	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 15:44	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	63.6	30-150		7/20/18 15:44
Decachlorobiphenyl [2]	71.6	30-150		7/20/18 15:44
Tetrachloro-m-xylene [1]	69.5	30-150		7/20/18 15:44
Tetrachloro-m-xylene [2]	68.3	30-150		7/20/18 15:44

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AP15-E-071118-1 | Sampled: 7/11/2018 09:55

Sample ID: 18G0509-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.3		% Wt	1		SM 2540G	7/17/18	7/18/18 14:22	JFC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13R-A-071118-1 | Sampled: 7/11/2018 12:53

Sample ID: 18G0509-07

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	25	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 2:36	IMR
Dichlorobiphenyls	150	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 2:36	IMR
Trichlorobiphenyls	190	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 2:36	IMR
Tetrachlorobiphenyls	49	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 2:36	IMR
Pentachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 2:36	IMR
Hexachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 2:36	IMR
Heptachlorobiphenyls	ND	35	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 2:36	IMR
Octachlorobiphenyls	ND	35	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 2:36	IMR
Nonachlorobiphenyls	ND	58	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 2:36	IMR
Decachlorobiphenyl	ND	58	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 2:36	IMR
Total Polychlorinated biphenyls	410		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 2:36	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	107	50-125				7/25/18 2:36	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13R-A-071118-1 | Sampled: 7/11/2018 12:53

Sample ID: 18G0509-07

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.6		% Wt	1		SM 2540G	7/17/18	7/18/18 14:22	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13R-B-071118-1 | Sampled: 7/11/2018 12:50

Sample ID: 18G0509-08

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	130	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:13	IMR
Dichlorobiphenyls	1000	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:13	IMR
Trichlorobiphenyls	1400	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:13	IMR
Tetrachlorobiphenyls	530	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:13	IMR
Pentachlorobiphenyls	170	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:13	IMR
Hexachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:13	IMR
Heptachlorobiphenyls	ND	34	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:13	IMR
Octachlorobiphenyls	ND	34	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:13	IMR
Nonachlorobiphenyls	ND	57	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:13	IMR
Decachlorobiphenyl	ND	57	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:13	IMR
Total Polychlorinated biphenyls	3200		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:13	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Tetrachloro-m-xylene	**187** *	50-125	S-03	7/25/18 3:13	

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13R-B-071118-1 | Sampled: 7/11/2018 12:50

Sample ID: 18G0509-08

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.5		% Wt	1		SM 2540G	7/17/18	7/18/18 14:23	JFC

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13R-E-071118-1 | Sampled: 7/11/2018 12:55

Sample ID: 18G0509-09

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.87	mg/Kg dry	40		SW-846 8082A	7/18/18	7/22/18 11:51	KAL
Aroclor-1221 [1]	ND	0.87	mg/Kg dry	40		SW-846 8082A	7/18/18	7/22/18 11:51	KAL
Aroclor-1232 [1]	ND	0.87	mg/Kg dry	40		SW-846 8082A	7/18/18	7/22/18 11:51	KAL
Aroclor-1242 [2]	8.5	0.87	mg/Kg dry	40		SW-846 8082A	7/18/18	7/22/18 11:51	KAL
Aroclor-1248 [1]	ND	0.87	mg/Kg dry	40		SW-846 8082A	7/18/18	7/22/18 11:51	KAL
Aroclor-1254 [1]	ND	0.87	mg/Kg dry	40		SW-846 8082A	7/18/18	7/22/18 11:51	KAL
Aroclor-1260 [1]	ND	0.87	mg/Kg dry	40		SW-846 8082A	7/18/18	7/22/18 11:51	KAL
Aroclor-1262 [1]	ND	0.87	mg/Kg dry	40		SW-846 8082A	7/18/18	7/22/18 11:51	KAL
Aroclor-1268 [1]	ND	0.87	mg/Kg dry	40		SW-846 8082A	7/18/18	7/22/18 11:51	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	*	30-150	S-01	7/22/18 11:51
Decachlorobiphenyl [2]	*	30-150	S-01	7/22/18 11:51
Tetrachloro-m-xylene [1]	*	30-150	S-01	7/22/18 11:51
Tetrachloro-m-xylene [2]	*	30-150	S-01	7/22/18 11:51

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13R-E-071118-1 | Sampled: 7/11/2018 12:55

Sample ID: 18G0509-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.5		% Wt	1		SM 2540G	7/17/18	7/18/18 14:23	JFC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13B-A-071118-1 | Sampled: 7/11/2018 13:26

Sample ID: 18G0509-10

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:51	IMR
Dichlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:51	IMR
Trichlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:51	IMR
Tetrachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:51	IMR
Pentachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:51	IMR
Hexachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:51	IMR
Heptachlorobiphenyls	ND	34	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:51	IMR
Octachlorobiphenyls	ND	34	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:51	IMR
Nonachlorobiphenyls	ND	57	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:51	IMR
Decachlorobiphenyl	ND	57	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:51	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 3:51	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	64.8	50-125				7/25/18 3:51	

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13B-A-071118-1 | Sampled: 7/11/2018 13:26

Sample ID: 18G0509-10

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.5		% Wt	1		SM 2540G	7/17/18	7/18/18 14:23	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13B-B-071118-1 | Sampled: 7/11/2018 13:24

Sample ID: 18G0509-11

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 5:43	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 5:43	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 5:43	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 5:43	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 5:43	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 5:43	IMR
Heptachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 5:43	IMR
Octachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 5:43	IMR
Nonachlorobiphenyls	ND	60	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 5:43	IMR
Decachlorobiphenyl	ND	60	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 5:43	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 5:43	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Tetrachloro-m-xylene	125	50-125	S-17	7/25/18 5:43	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13B-B-071118-1 | Sampled: 7/11/2018 13:24

Sample ID: 18G0509-11

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.4		% Wt	1		SM 2540G	7/17/18	7/18/18 14:23	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13B-E-071118-1 | Sampled: 7/11/2018 13:28

Sample ID: 18G0509-12

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 16:19	KAL
Aroclor-1221 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 16:19	KAL
Aroclor-1232 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 16:19	KAL
Aroclor-1242 [2]	0.60	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 16:19	KAL
Aroclor-1248 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 16:19	KAL
Aroclor-1254 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 16:19	KAL
Aroclor-1260 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 16:19	KAL
Aroclor-1262 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 16:19	KAL
Aroclor-1268 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 16:19	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	59.8	30-150		7/20/18 16:19
Decachlorobiphenyl [2]	67.0	30-150		7/20/18 16:19
Tetrachloro-m-xylene [1]	67.8	30-150		7/20/18 16:19
Tetrachloro-m-xylene [2]	67.5	30-150		7/20/18 16:19

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13B-E-071118-1 | Sampled: 7/11/2018 13:28

Sample ID: 18G0509-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.3		% Wt	1		SM 2540G	7/17/18	7/18/18 14:23	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13D-A-071118-1 | Sampled: 7/11/2018 13:40

Sample ID: 18G0509-13

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:20	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:20	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:20	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:20	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:20	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:20	IMR
Heptachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:20	IMR
Octachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:20	IMR
Nonachlorobiphenyls	ND	61	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:20	IMR
Decachlorobiphenyl	ND	61	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:20	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:20	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	122	50-125				7/25/18 6:20	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13D-A-071118-1 | Sampled: 7/11/2018 13:40

Sample ID: 18G0509-13

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.5		% Wt	1		SM 2540G	7/17/18	7/18/18 14:23	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13D-B-071118-1 | Sampled: 7/11/2018 13:38

Sample ID: 18G0509-14

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:58	IMR
Dichlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:58	IMR
Trichlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:58	IMR
Tetrachlorobiphenyls	ND	22	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:58	IMR
Pentachlorobiphenyls	ND	22	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:58	IMR
Hexachlorobiphenyls	ND	22	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:58	IMR
Heptachlorobiphenyls	ND	33	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:58	IMR
Octachlorobiphenyls	ND	33	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:58	IMR
Nonachlorobiphenyls	ND	54	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:58	IMR
Decachlorobiphenyl	ND	54	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:58	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 6:58	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Tetrachloro-m-xylene	125	50-125	S-17	7/25/18 6:58	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13D-B-071118-1 | Sampled: 7/11/2018 13:38

Sample ID: 18G0509-14

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.4		% Wt	1		SM 2540G	7/17/18	7/18/18 14:23	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13D-E-071118-1 | Sampled: 7/11/2018 13:44

Sample ID: 18G0509-15

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:16	KAL
Aroclor-1221 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:16	KAL
Aroclor-1232 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:16	KAL
Aroclor-1242 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:16	KAL
Aroclor-1248 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:16	KAL
Aroclor-1254 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:16	KAL
Aroclor-1260 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:16	KAL
Aroclor-1262 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:16	KAL
Aroclor-1268 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:16	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	76.7	30-150		7/20/18 18:16
Decachlorobiphenyl [2]	87.2	30-150		7/20/18 18:16
Tetrachloro-m-xylene [1]	82.9	30-150		7/20/18 18:16
Tetrachloro-m-xylene [2]	81.8	30-150		7/20/18 18:16

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13D-E-071118-1 | Sampled: 7/11/2018 13:44

Sample ID: 18G0509-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.6		% Wt	1		SM 2540G	7/17/18	7/18/18 14:24	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AH10-A-071118-1 | Sampled: 7/11/2018 14:25

Sample ID: 18G0509-16

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 7:35	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 7:35	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 7:35	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 7:35	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 7:35	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 7:35	IMR
Heptachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 7:35	IMR
Octachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 7:35	IMR
Nonachlorobiphenyls	ND	61	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 7:35	IMR
Decachlorobiphenyl	ND	61	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 7:35	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 7:35	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	89.0	50-125				7/25/18 7:35	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AH10-A-071118-1 | Sampled: 7/11/2018 14:25

Sample ID: 18G0509-16

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.6		% Wt	1		SM 2540G	7/17/18	7/18/18 14:24	JFC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AH10-B-071118-1 | Sampled: 7/11/2018 14:20

Sample ID: 18G0509-17

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:13	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:13	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:13	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:13	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:13	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:13	IMR
Heptachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:13	IMR
Octachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:13	IMR
Nonachlorobiphenyls	ND	61	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:13	IMR
Decachlorobiphenyl	ND	61	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:13	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:13	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	107	50-125				7/25/18 8:13	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AH10-B-071118-1 | Sampled: 7/11/2018 14:20

Sample ID: 18G0509-17

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.3		% Wt	1		SM 2540G	7/17/18	7/18/18 14:24	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AH10-E-071118-1 | Sampled: 7/11/2018 14:23

Sample ID: 18G0509-18

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:34	KAL
Aroclor-1221 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:34	KAL
Aroclor-1232 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:34	KAL
Aroclor-1242 [2]	0.12	0.088	mg/Kg dry	4	P-01	SW-846 8082A	7/18/18	7/20/18 18:34	KAL
Aroclor-1248 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:34	KAL
Aroclor-1254 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:34	KAL
Aroclor-1260 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:34	KAL
Aroclor-1262 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:34	KAL
Aroclor-1268 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:34	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	75.3	30-150		7/20/18 18:34
Decachlorobiphenyl [2]	81.1	30-150		7/20/18 18:34
Tetrachloro-m-xylene [1]	84.4	30-150		7/20/18 18:34
Tetrachloro-m-xylene [2]	85.0	30-150		7/20/18 18:34

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AH10-E-071118-1 | Sampled: 7/11/2018 14:23

Sample ID: 18G0509-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.5		% Wt	1		SM 2540G	7/17/18	7/18/18 14:24	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AG12-A-071118-1 | Sampled: 7/11/2018 14:05

Sample ID: 18G0509-19

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:50	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:50	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:50	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:50	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:50	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:50	IMR
Heptachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:50	IMR
Octachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:50	IMR
Nonachlorobiphenyls	ND	60	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:50	IMR
Decachlorobiphenyl	ND	60	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:50	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 8:50	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Tetrachloro-m-xylene	**146** *	50-125	S-17	7/25/18 8:50	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AG12-A-071118-1 | Sampled: 7/11/2018 14:05

Sample ID: 18G0509-19

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.4		% Wt	1		SM 2540G	7/17/18	7/18/18 14:24	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AG12-B-071118-1 | Sampled: 7/11/2018 14:00

Sample ID: 18G0509-20

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	10	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 9:28	IMR
Dichlorobiphenyls	ND	10	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 9:28	IMR
Trichlorobiphenyls	ND	10	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 9:28	IMR
Tetrachlorobiphenyls	ND	21	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 9:28	IMR
Pentachlorobiphenyls	ND	21	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 9:28	IMR
Hexachlorobiphenyls	ND	21	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 9:28	IMR
Heptachlorobiphenyls	ND	31	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 9:28	IMR
Octachlorobiphenyls	ND	31	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 9:28	IMR
Nonachlorobiphenyls	ND	52	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 9:28	IMR
Decachlorobiphenyl	ND	52	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 9:28	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 9:28	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Tetrachloro-m-xylene	**130** *	50-125	S-17	7/25/18 9:28	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AG12-B-071118-1 | Sampled: 7/11/2018 14:00

Sample ID: 18G0509-20

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.5		% Wt	1		SM 2540G	7/17/18	7/18/18 14:25	JFC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AG12-E-071118-1 | Sampled: 7/11/2018 14:07

Sample ID: 18G0509-21

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.089	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:51	KAL
Aroclor-1221 [1]	ND	0.089	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:51	KAL
Aroclor-1232 [1]	ND	0.089	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:51	KAL
Aroclor-1242 [1]	ND	0.089	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:51	KAL
Aroclor-1248 [1]	ND	0.089	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:51	KAL
Aroclor-1254 [1]	ND	0.089	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:51	KAL
Aroclor-1260 [1]	ND	0.089	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:51	KAL
Aroclor-1262 [1]	ND	0.089	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:51	KAL
Aroclor-1268 [1]	ND	0.089	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 18:51	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	73.0	30-150		7/20/18 18:51
Decachlorobiphenyl [2]	81.4	30-150		7/20/18 18:51
Tetrachloro-m-xylene [1]	81.4	30-150		7/20/18 18:51
Tetrachloro-m-xylene [2]	81.2	30-150		7/20/18 18:51

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AG12-E-071118-1 | Sampled: 7/11/2018 14:07

Sample ID: 18G0509-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.9		% Wt	1		SM 2540G	7/17/18	7/18/18 14:25	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ12-A-071118-1 | Sampled: 7/11/2018 14:40

Sample ID: 18G0509-22

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:05	IMR
Dichlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:05	IMR
Trichlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:05	IMR
Tetrachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:05	IMR
Pentachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:05	IMR
Hexachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:05	IMR
Heptachlorobiphenyls	ND	34	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:05	IMR
Octachlorobiphenyls	ND	34	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:05	IMR
Nonachlorobiphenyls	ND	57	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:05	IMR
Decachlorobiphenyl	ND	57	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:05	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:05	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	101	50-125				7/25/18 10:05	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ12-A-071118-1 | Sampled: 7/11/2018 14:40

Sample ID: 18G0509-22

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	82.6		% Wt	1		SM 2540G	7/17/18	7/18/18 14:25	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ12-B-071118-1 | Sampled: 7/11/2018 14:33

Sample ID: 18G0509-23

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:43	IMR
Dichlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:43	IMR
Trichlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:43	IMR
Tetrachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:43	IMR
Pentachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:43	IMR
Hexachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:43	IMR
Heptachlorobiphenyls	ND	34	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:43	IMR
Octachlorobiphenyls	ND	34	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:43	IMR
Nonachlorobiphenyls	ND	57	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:43	IMR
Decachlorobiphenyl	ND	57	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:43	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 10:43	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	112	50-125				7/25/18 10:43	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ12-B-071118-1 | Sampled: 7/11/2018 14:33

Sample ID: 18G0509-23

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	98.7		% Wt	1		SM 2540G	7/17/18	7/18/18 14:25	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ12-E-071118-1 | Sampled: 7/11/2018 14:45

Sample ID: 18G0509-24

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:09	KAL
Aroclor-1221 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:09	KAL
Aroclor-1232 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:09	KAL
Aroclor-1242 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:09	KAL
Aroclor-1248 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:09	KAL
Aroclor-1254 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:09	KAL
Aroclor-1260 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:09	KAL
Aroclor-1262 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:09	KAL
Aroclor-1268 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:09	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	70.6	30-150		7/20/18 19:09
Decachlorobiphenyl [2]	79.5	30-150		7/20/18 19:09
Tetrachloro-m-xylene [1]	79.4	30-150		7/20/18 19:09
Tetrachloro-m-xylene [2]	79.3	30-150		7/20/18 19:09

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ12-E-071118-1 | Sampled: 7/11/2018 14:45

Sample ID: 18G0509-24

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.2		% Wt	1		SM 2540G	7/17/18	7/18/18 14:25	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13A-A-071118-1 | Sampled: 7/11/2018 13:00

Sample ID: 18G0509-25

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:20	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:20	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:20	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:20	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:20	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:20	IMR
Heptachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:20	IMR
Octachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:20	IMR
Nonachlorobiphenyls	ND	60	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:20	IMR
Decachlorobiphenyl	ND	60	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:20	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:20	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	89.8	50-125				7/25/18 11:20	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13A-A-071118-1 | Sampled: 7/11/2018 13:00

Sample ID: 18G0509-25

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.5		% Wt	1		SM 2540G	7/17/18	7/18/18 14:25	JFC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13A-B-071118-1 | Sampled: 7/11/2018 13:03

Sample ID: 18G0509-26

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:58	IMR
Dichlorobiphenyls	62	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:58	IMR
Trichlorobiphenyls	110	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:58	IMR
Tetrachlorobiphenyls	ND	22	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:58	IMR
Pentachlorobiphenyls	ND	22	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:58	IMR
Hexachlorobiphenyls	ND	22	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:58	IMR
Heptachlorobiphenyls	ND	32	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:58	IMR
Octachlorobiphenyls	ND	32	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:58	IMR
Nonachlorobiphenyls	ND	54	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:58	IMR
Decachlorobiphenyl	ND	54	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:58	IMR
Total Polychlorinated biphenyls	170		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 11:58	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	120	50-125					7/25/18 11:58

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13A-B-071118-1 | Sampled: 7/11/2018 13:03

Sample ID: 18G0509-26

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.3		% Wt	1		SM 2540G	7/17/18	7/18/18 14:25	JFC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13A-E-071118-1 | Sampled: 7/11/2018 13:15

Sample ID: 18G0509-27

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:08	KAL
Aroclor-1221 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:08	KAL
Aroclor-1232 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:08	KAL
Aroclor-1242 [2]	2.3	0.43	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:08	KAL
Aroclor-1248 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:08	KAL
Aroclor-1254 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:08	KAL
Aroclor-1260 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:08	KAL
Aroclor-1262 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:08	KAL
Aroclor-1268 [1]	ND	0.43	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:08	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	71.4	30-150		7/22/18 12:08
Decachlorobiphenyl [2]	74.5	30-150		7/22/18 12:08
Tetrachloro-m-xylene [1]	80.7	30-150		7/22/18 12:08
Tetrachloro-m-xylene [2]	76.4	30-150		7/22/18 12:08

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13A-E-071118-1 | Sampled: 7/11/2018 13:15

Sample ID: 18G0509-27

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.6		% Wt	1		SM 2540G	7/17/18	7/18/18 14:25	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AP14-A-071118-1 | Sampled: 7/11/2018 10:13

Sample ID: 18G0509-28

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 12:35	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 12:35	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 12:35	IMR
Tetrachlorobiphenyls	ND	25	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 12:35	IMR
Pentachlorobiphenyls	ND	25	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 12:35	IMR
Hexachlorobiphenyls	ND	25	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 12:35	IMR
Heptachlorobiphenyls	ND	37	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 12:35	IMR
Octachlorobiphenyls	ND	37	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 12:35	IMR
Nonachlorobiphenyls	ND	61	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 12:35	IMR
Decachlorobiphenyl	ND	61	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 12:35	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 12:35	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Tetrachloro-m-xylene	**128** *	50-125	S-17	7/25/18 12:35

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AP14-A-071118-1 | Sampled: 7/11/2018 10:13

Sample ID: 18G0509-28

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.4		% Wt	1		SM 2540G	7/17/18	7/18/18 14:25	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AP14-B-071118-1 | Sampled: 7/11/2018 10:12

Sample ID: 18G0509-29

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	8.8	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 21:33	IMR
Dichlorobiphenyls	ND	8.8	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 21:33	IMR
Trichlorobiphenyls	ND	8.8	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 21:33	IMR
Tetrachlorobiphenyls	ND	18	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 21:33	IMR
Pentachlorobiphenyls	ND	18	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 21:33	IMR
Hexachlorobiphenyls	ND	18	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 21:33	IMR
Heptachlorobiphenyls	ND	26	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 21:33	IMR
Octachlorobiphenyls	ND	26	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 21:33	IMR
Nonachlorobiphenyls	ND	44	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 21:33	IMR
Decachlorobiphenyl	ND	44	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 21:33	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 21:33	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	88.7	50-125				7/25/18 21:33	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AP14-B-071118-1 | Sampled: 7/11/2018 10:12

Sample ID: 18G0509-29

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.4		% Wt	1		SM 2540G	7/17/18	7/18/18 14:25	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AP14-E-071118-1 | Sampled: 7/11/2018 10:14

Sample ID: 18G0509-30

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:44	KAL
Aroclor-1221 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:44	KAL
Aroclor-1232 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:44	KAL
Aroclor-1242 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:44	KAL
Aroclor-1248 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:44	KAL
Aroclor-1254 [2]	0.33	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:44	KAL
Aroclor-1260 [2]	0.28	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:44	KAL
Aroclor-1262 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:44	KAL
Aroclor-1268 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 19:44	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	77.3	30-150		7/20/18 19:44
Decachlorobiphenyl [2]	86.8	30-150		7/20/18 19:44
Tetrachloro-m-xylene [1]	86.2	30-150		7/20/18 19:44
Tetrachloro-m-xylene [2]	87.1	30-150		7/20/18 19:44

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AP14-E-071118-1 | Sampled: 7/11/2018 10:14

Sample ID: 18G0509-30

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.3		% Wt	1		SM 2540G	7/17/18	7/18/18 14:26	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AM13-A-071118-1 | Sampled: 7/11/2018 10:32

Sample ID: 18G0509-31

Sample Matrix: Product/Solid

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/25/18 20:56	IMR
Dichlorobiphenyls	ND	12	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/25/18 20:56	IMR
Trichlorobiphenyls	ND	12	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/25/18 20:56	IMR
Tetrachlorobiphenyls	ND	23	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/25/18 20:56	IMR
Pentachlorobiphenyls	ND	23	µg/kg	25	RL-12, V-20	EPA 680 Modified	7/17/18	7/25/18 20:56	IMR
Hexachlorobiphenyls	ND	23	µg/kg	25	RL-12, V-20	EPA 680 Modified	7/17/18	7/25/18 20:56	IMR
Heptachlorobiphenyls	ND	35	µg/kg	25	RL-12, V-20	EPA 680 Modified	7/17/18	7/25/18 20:56	IMR
Octachlorobiphenyls	ND	35	µg/kg	25	RL-12, V-20	EPA 680 Modified	7/17/18	7/25/18 20:56	IMR
Nonachlorobiphenyls	ND	58	µg/kg	25	RL-12, V-20	EPA 680 Modified	7/17/18	7/25/18 20:56	IMR
Decachlorobiphenyl	ND	58	µg/kg	25	RL-12, V-20	EPA 680 Modified	7/17/18	7/25/18 20:56	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/25/18 20:56	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Tetrachloro-m-xylene	114	50-125	RL-12		7/25/18 20:56

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AM13-A-071118-1 | Sampled: 7/11/2018 10:32

Sample ID: 18G0509-31

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.0		% Wt	1		SM 2540G	7/17/18	7/18/18 14:26	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AM13-B-071118-1 | Sampled: 7/11/2018 10:30

Sample ID: 18G0509-32

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 22:11	IMR
Dichlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 22:11	IMR
Trichlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 22:11	IMR
Tetrachlorobiphenyls	ND	21	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 22:11	IMR
Pentachlorobiphenyls	ND	21	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 22:11	IMR
Hexachlorobiphenyls	ND	21	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 22:11	IMR
Heptachlorobiphenyls	ND	32	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 22:11	IMR
Octachlorobiphenyls	ND	32	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 22:11	IMR
Nonachlorobiphenyls	ND	53	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 22:11	IMR
Decachlorobiphenyl	ND	53	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 22:11	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 22:11	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	82.9	50-125				7/25/18 22:11	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AM13-B-071118-1 | Sampled: 7/11/2018 10:30

Sample ID: 18G0509-32

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	98.4		% Wt	1		SM 2540G	7/17/18	7/18/18 14:26	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AM13-E-071118-1 | Sampled: 7/11/2018 10:35

Sample ID: 18G0509-33

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 20:01	KAL
Aroclor-1221 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 20:01	KAL
Aroclor-1232 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 20:01	KAL
Aroclor-1242 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 20:01	KAL
Aroclor-1248 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 20:01	KAL
Aroclor-1254 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 20:01	KAL
Aroclor-1260 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 20:01	KAL
Aroclor-1262 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 20:01	KAL
Aroclor-1268 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 20:01	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	76.1	30-150		7/20/18 20:01
Decachlorobiphenyl [2]	88.3	30-150		7/20/18 20:01
Tetrachloro-m-xylene [1]	84.6	30-150		7/20/18 20:01
Tetrachloro-m-xylene [2]	84.1	30-150		7/20/18 20:01

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AM13-E-071118-1 | Sampled: 7/11/2018 10:35

Sample ID: 18G0509-33

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.7		% Wt	1		SM 2540G	7/17/18	7/18/18 14:26	JFC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ15-A-071118-1 | Sampled: 7/11/2018 11:10

Sample ID: 18G0509-34

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 22:48	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 22:48	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 22:48	IMR
Tetrachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 22:48	IMR
Pentachlorobiphenyls	ND	23	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 22:48	IMR
Hexachlorobiphenyls	ND	23	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 22:48	IMR
Heptachlorobiphenyls	ND	35	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 22:48	IMR
Octachlorobiphenyls	ND	35	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 22:48	IMR
Nonachlorobiphenyls	ND	58	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 22:48	IMR
Decachlorobiphenyl	ND	58	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 22:48	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 22:48	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	80.5	50-125				7/25/18 22:48	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ15-A-071118-1 | Sampled: 7/11/2018 11:10

Sample ID: 18G0509-34

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	71.6		% Wt	1		SM 2540G	7/17/18	7/18/18 14:27	JFC

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ15-B-071118-1 | Sampled: 7/11/2018 11:07

Sample ID: 18G0509-35

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 23:26	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 23:26	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 23:26	IMR
Tetrachlorobiphenyls	ND	25	µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 23:26	IMR
Pentachlorobiphenyls	ND	25	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 23:26	IMR
Hexachlorobiphenyls	ND	25	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 23:26	IMR
Heptachlorobiphenyls	ND	37	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 23:26	IMR
Octachlorobiphenyls	ND	37	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 23:26	IMR
Nonachlorobiphenyls	ND	61	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 23:26	IMR
Decachlorobiphenyl	ND	61	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/25/18 23:26	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/25/18 23:26	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	96.2	50-125				7/25/18 23:26	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ15-B-071118-1 | Sampled: 7/11/2018 11:07

Sample ID: 18G0509-35

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.5		% Wt	1		SM 2540G	7/17/18	7/18/18 14:27	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ15-E-071118-1 | Sampled: 7/11/2018 11:17

Sample ID: 18G0509-36

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:26	KAL
Aroclor-1221 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:26	KAL
Aroclor-1232 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:26	KAL
Aroclor-1242 [2]	2.8	0.44	mg/Kg dry	20	P-01	SW-846 8082A	7/18/18	7/22/18 12:26	KAL
Aroclor-1248 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:26	KAL
Aroclor-1254 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:26	KAL
Aroclor-1260 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:26	KAL
Aroclor-1262 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:26	KAL
Aroclor-1268 [1]	ND	0.44	mg/Kg dry	20		SW-846 8082A	7/18/18	7/22/18 12:26	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	63.1	30-150		7/22/18 12:26
Decachlorobiphenyl [2]	64.2	30-150		7/22/18 12:26
Tetrachloro-m-xylene [1]	72.7	30-150		7/22/18 12:26
Tetrachloro-m-xylene [2]	68.3	30-150		7/22/18 12:26

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ15-E-071118-1 | Sampled: 7/11/2018 11:17

Sample ID: 18G0509-36

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.6		% Wt	1		SM 2540G	7/17/18	7/18/18 14:27	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13C-A-071118-1 | Sampled: 7/11/2018 11:38

Sample ID: 18G0509-37

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 0:03	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 0:03	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 0:03	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 0:03	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 0:03	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 0:03	IMR
Heptachlorobiphenyls	ND	37	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 0:03	IMR
Octachlorobiphenyls	ND	37	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 0:03	IMR
Nonachlorobiphenyls	ND	61	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 0:03	IMR
Decachlorobiphenyl	ND	61	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 0:03	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 0:03	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	57.2	50-125				7/26/18 0:03	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13C-A-071118-1 | Sampled: 7/11/2018 11:38

Sample ID: 18G0509-37

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.4		% Wt	1		SM 2540G	7/17/18	7/18/18 14:27	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13C-B-071118-1 | Sampled: 7/11/2018 11:34

Sample ID: 18G0509-38

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 0:41	IMR
Dichlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 0:41	IMR
Trichlorobiphenyls	ND	11	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 0:41	IMR
Tetrachlorobiphenyls	ND	22	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 0:41	IMR
Pentachlorobiphenyls	ND	22	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 0:41	IMR
Hexachlorobiphenyls	ND	22	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 0:41	IMR
Heptachlorobiphenyls	ND	33	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 0:41	IMR
Octachlorobiphenyls	ND	33	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 0:41	IMR
Nonachlorobiphenyls	ND	55	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 0:41	IMR
Decachlorobiphenyl	ND	55	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 0:41	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 0:41	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	80.6	50-125				7/26/18 0:41	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13C-B-071118-1 | Sampled: 7/11/2018 11:34

Sample ID: 18G0509-38

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	98.6		% Wt	1		SM 2540G	7/17/18	7/18/18 14:27	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13C-E-071118-1 | Sampled: 7/11/2018 11:50

Sample ID: 18G0509-39

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:41	KAL
Aroclor-1221 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:41	KAL
Aroclor-1232 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:41	KAL
Aroclor-1242 [2]	0.27	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:41	KAL
Aroclor-1248 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:41	KAL
Aroclor-1254 [2]	0.097	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:41	KAL
Aroclor-1260 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:41	KAL
Aroclor-1262 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:41	KAL
Aroclor-1268 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:41	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	66.2	30-150		7/20/18 21:41
Decachlorobiphenyl [2]	75.2	30-150		7/20/18 21:41
Tetrachloro-m-xylene [1]	76.3	30-150		7/20/18 21:41
Tetrachloro-m-xylene [2]	75.9	30-150		7/20/18 21:41

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AJ13C-E-071118-1 | Sampled: 7/11/2018 11:50

Sample ID: 18G0509-39

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.4		% Wt	1		SM 2540G	7/17/18	7/18/18 14:27	JFC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: DUP 20180711-A | Sampled: 7/11/2018 07:00

Sample ID: 18G0509-40

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 1:18	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 1:18	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 1:18	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 1:18	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 1:18	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 1:18	IMR
Heptachlorobiphenyls	ND	36	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 1:18	IMR
Octachlorobiphenyls	ND	36	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 1:18	IMR
Nonachlorobiphenyls	ND	60	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 1:18	IMR
Decachlorobiphenyl	ND	60	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 1:18	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 1:18	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	59.8	50-125				7/26/18 1:18	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: DUP 20180711-A | Sampled: 7/11/2018 07:00

Sample ID: 18G0509-40

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	96.2		% Wt	1		SM 2540G	7/17/18	7/18/18 14:27	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: DUP 20180711-B | Sampled: 7/11/2018 07:00

Sample ID: 18G0509-41

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25	V-05	EPA 680 Modified	7/17/18	7/26/18 15:13	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:13	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:13	IMR
Tetrachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:13	IMR
Pentachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:13	IMR
Hexachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:13	IMR
Heptachlorobiphenyls	ND	35	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:13	IMR
Octachlorobiphenyls	ND	35	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:13	IMR
Nonachlorobiphenyls	ND	58	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 15:13	IMR
Decachlorobiphenyl	ND	58	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 15:13	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:13	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	110	50-125				7/26/18 15:13	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: DUP 20180711-B | Sampled: 7/11/2018 07:00

Sample ID: 18G0509-41

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	98.9		% Wt	1		SM 2540G	7/17/18	7/18/18 14:27	JFC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: DUP 20180711-E | Sampled: 7/11/2018 07:00

Sample ID: 18G0509-42

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.086	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:58	KAL
Aroclor-1221 [1]	ND	0.086	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:58	KAL
Aroclor-1232 [1]	ND	0.086	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:58	KAL
Aroclor-1242 [2]	0.26	0.086	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:58	KAL
Aroclor-1248 [1]	ND	0.086	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:58	KAL
Aroclor-1254 [1]	ND	0.086	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:58	KAL
Aroclor-1260 [1]	ND	0.086	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:58	KAL
Aroclor-1262 [1]	ND	0.086	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:58	KAL
Aroclor-1268 [1]	ND	0.086	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 21:58	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	63.6	30-150		7/20/18 21:58
Decachlorobiphenyl [2]	71.7	30-150		7/20/18 21:58
Tetrachloro-m-xylene [1]	71.9	30-150		7/20/18 21:58
Tetrachloro-m-xylene [2]	72.0	30-150		7/20/18 21:58

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: DUP 20180711-E | Sampled: 7/11/2018 07:00

Sample ID: 18G0509-42

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.3		% Wt	1		SM 2540G	7/17/18	7/18/18 14:28	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AC9-A-071218-1 | Sampled: 7/12/2018 09:55

Sample ID: 18G0509-43

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25	V-05	EPA 680 Modified	7/17/18	7/26/18 15:51	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:51	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:51	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:51	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:51	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:51	IMR
Heptachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:51	IMR
Octachlorobiphenyls	ND	36	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:51	IMR
Nonachlorobiphenyls	ND	60	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 15:51	IMR
Decachlorobiphenyl	ND	60	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 15:51	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 15:51	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual			
Tetrachloro-m-xylene	101	50-125				7/26/18 15:51

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AC9-A-071218-1 | Sampled: 7/12/2018 09:55

Sample ID: 18G0509-43

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.5		% Wt	1		SM 2540G	7/17/18	7/18/18 14:28	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AC9-B-071218-1 | Sampled: 7/12/2018 09:56

Sample ID: 18G0509-44

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	10	µg/kg	25	V-05	EPA 680 Modified	7/17/18	7/26/18 16:28	IMR
Dichlorobiphenyls	ND	10	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 16:28	IMR
Trichlorobiphenyls	ND	10	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 16:28	IMR
Tetrachlorobiphenyls	ND	21	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 16:28	IMR
Pentachlorobiphenyls	ND	21	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 16:28	IMR
Hexachlorobiphenyls	ND	21	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 16:28	IMR
Heptachlorobiphenyls	ND	31	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 16:28	IMR
Octachlorobiphenyls	ND	31	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 16:28	IMR
Nonachlorobiphenyls	ND	51	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 16:28	IMR
Decachlorobiphenyl	ND	51	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 16:28	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 16:28	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Tetrachloro-m-xylene	**175** *	50-125	S-17	7/26/18 16:28	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AC9-B-071218-1 | Sampled: 7/12/2018 09:56

Sample ID: 18G0509-44

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.3		% Wt	1		SM 2540G	7/17/18	7/18/18 14:28	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AC9-E-071218-1 | Sampled: 7/12/2018 10:01

Sample ID: 18G0509-45

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:16	KAL
Aroclor-1221 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:16	KAL
Aroclor-1232 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:16	KAL
Aroclor-1242 [1]	0.38	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:16	KAL
Aroclor-1248 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:16	KAL
Aroclor-1254 [2]	0.19	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:16	KAL
Aroclor-1260 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:16	KAL
Aroclor-1262 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:16	KAL
Aroclor-1268 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:16	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	79.6	30-150		7/20/18 22:16
Decachlorobiphenyl [2]	88.7	30-150		7/20/18 22:16
Tetrachloro-m-xylene [1]	88.0	30-150		7/20/18 22:16
Tetrachloro-m-xylene [2]	88.9	30-150		7/20/18 22:16

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AC9-E-071218-1 | Sampled: 7/12/2018 10:01

Sample ID: 18G0509-45

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.9		% Wt	1		SM 2540G	7/17/18	7/18/18 14:28	JFC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AA10-A-071218-1 | Sampled: 7/12/2018 09:35

Sample ID: 18G0509-46

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25	V-05	EPA 680 Modified	7/17/18	7/26/18 17:06	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 17:06	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 17:06	IMR
Tetrachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 17:06	IMR
Pentachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 17:06	IMR
Hexachlorobiphenyls	ND	23	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 17:06	IMR
Heptachlorobiphenyls	ND	35	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 17:06	IMR
Octachlorobiphenyls	ND	35	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 17:06	IMR
Nonachlorobiphenyls	ND	58	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 17:06	IMR
Decachlorobiphenyl	ND	58	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 17:06	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 17:06	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual			
Tetrachloro-m-xylene	94.5	50-125				7/26/18 17:06

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AA10-A-071218-1 | Sampled: 7/12/2018 09:35

Sample ID: 18G0509-46

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.5		% Wt	1		SM 2540G	7/17/18	7/18/18 14:28	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AA10-B-071218-1 | Sampled: 7/12/2018 09:37

Sample ID: 18G0509-47

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	44	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:19	IMR
Dichlorobiphenyls	ND	44	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:19	IMR
Trichlorobiphenyls	ND	44	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:19	IMR
Tetrachlorobiphenyls	ND	88	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:19	IMR
Pentachlorobiphenyls	ND	88	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:19	IMR
Hexachlorobiphenyls	ND	88	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:19	IMR
Heptachlorobiphenyls	ND	130	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:19	IMR
Octachlorobiphenyls	ND	130	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:19	IMR
Nonachlorobiphenyls	ND	220	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:19	IMR
Decachlorobiphenyl	ND	220	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:19	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:19	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	95.0	50-125				7/27/18 11:19	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AA10-B-071218-1 | Sampled: 7/12/2018 09:37

Sample ID: 18G0509-47

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.4		% Wt	1		SM 2540G	7/17/18	7/18/18 14:28	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AA10-E-071218-1 | Sampled: 7/12/2018 09:40

Sample ID: 18G0509-48

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:33	KAL
Aroclor-1221 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:33	KAL
Aroclor-1232 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:33	KAL
Aroclor-1242 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:33	KAL
Aroclor-1248 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:33	KAL
Aroclor-1254 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:33	KAL
Aroclor-1260 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:33	KAL
Aroclor-1262 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:33	KAL
Aroclor-1268 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:33	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	65.0	30-150		7/20/18 22:33
Decachlorobiphenyl [2]	72.9	30-150		7/20/18 22:33
Tetrachloro-m-xylene [1]	74.1	30-150		7/20/18 22:33
Tetrachloro-m-xylene [2]	74.1	30-150		7/20/18 22:33

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AA10-E-071218-1 | Sampled: 7/12/2018 09:40

Sample ID: 18G0509-48

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.1		% Wt	1		SM 2540G	7/17/18	7/18/18 14:28	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AD11-A-071218-1 | Sampled: 7/12/2018 08:35

Sample ID: 18G0509-49

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	11	µg/kg	25	H-04	EPA 680 Modified	7/27/18	7/31/18 19:05	IMR
Monochlorobiphenyls	ND	12	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/27/18 10:41	IMR
Dichlorobiphenyls	ND	11	µg/kg	25	H-04	EPA 680 Modified	7/27/18	7/31/18 19:05	IMR
Dichlorobiphenyls	ND	12	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/27/18 10:41	IMR
Trichlorobiphenyls	ND	12	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/27/18 10:41	IMR
Trichlorobiphenyls	ND	11	µg/kg	25	H-04	EPA 680 Modified	7/27/18	7/31/18 19:05	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/27/18 10:41	IMR
Tetrachlorobiphenyls	ND	22	µg/kg	25	H-04, V-20	EPA 680 Modified	7/27/18	7/31/18 19:05	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/27/18 10:41	IMR
Pentachlorobiphenyls	ND	22	µg/kg	25	H-04	EPA 680 Modified	7/27/18	7/31/18 19:05	IMR
Hexachlorobiphenyls	ND	22	µg/kg	25	H-04, V-20	EPA 680 Modified	7/27/18	7/31/18 19:05	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/27/18 10:41	IMR
Heptachlorobiphenyls	ND	33	µg/kg	25	H-04, V-20	EPA 680 Modified	7/27/18	7/31/18 19:05	IMR
Heptachlorobiphenyls	ND	37	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/27/18 10:41	IMR
Octachlorobiphenyls	ND	33	µg/kg	25	H-04, V-20	EPA 680 Modified	7/27/18	7/31/18 19:05	IMR
Octachlorobiphenyls	ND	37	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/27/18 10:41	IMR
Nonachlorobiphenyls	ND	55	µg/kg	25	H-04	EPA 680 Modified	7/27/18	7/31/18 19:05	IMR
Nonachlorobiphenyls	ND	61	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/27/18 10:41	IMR
Decachlorobiphenyl	ND	55	µg/kg	25	H-04	EPA 680 Modified	7/27/18	7/31/18 19:05	IMR
Decachlorobiphenyl	ND	61	µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/27/18 10:41	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25	RL-12	EPA 680 Modified	7/17/18	7/27/18 10:41	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25	H-04	EPA 680 Modified	7/27/18	7/31/18 19:05	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Tetrachloro-m-xylene	*	50-125	RL-12, S-10	7/27/18	10:41
Tetrachloro-m-xylene	80.7	50-125	H-04	7/31/18	19:05

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AD11-A-071218-1 | Sampled: 7/12/2018 08:35

Sample ID: 18G0509-49

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.4		% Wt	1		SM 2540G	7/17/18	7/18/18 14:28	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AD11-B-071218-1 | Sampled: 7/12/2018 08:37

Sample ID: 18G0509-50

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	44	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:56	IMR
Dichlorobiphenyls	ND	44	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:56	IMR
Trichlorobiphenyls	ND	44	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:56	IMR
Tetrachlorobiphenyls	ND	88	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:56	IMR
Pentachlorobiphenyls	ND	88	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:56	IMR
Hexachlorobiphenyls	ND	88	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:56	IMR
Heptachlorobiphenyls	ND	130	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:56	IMR
Octachlorobiphenyls	ND	130	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:56	IMR
Nonachlorobiphenyls	ND	220	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:56	IMR
Decachlorobiphenyl	ND	220	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:56	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 11:56	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	114	50-125				7/27/18 11:56	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AD11-B-071218-1 | Sampled: 7/12/2018 08:37

Sample ID: 18G0509-50

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.2		% Wt	1		SM 2540G	7/17/18	7/18/18 14:28	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AD11-E-071218-1 | Sampled: 7/12/2018 08:38

Sample ID: 18G0509-51

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:51	KAL
Aroclor-1221 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:51	KAL
Aroclor-1232 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:51	KAL
Aroclor-1242 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:51	KAL
Aroclor-1248 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:51	KAL
Aroclor-1254 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:51	KAL
Aroclor-1260 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:51	KAL
Aroclor-1262 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:51	KAL
Aroclor-1268 [1]	ND	0.087	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 22:51	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	68.4	30-150		7/20/18 22:51
Decachlorobiphenyl [2]	78.3	30-150		7/20/18 22:51
Tetrachloro-m-xylene [1]	75.8	30-150		7/20/18 22:51
Tetrachloro-m-xylene [2]	75.7	30-150		7/20/18 22:51

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AD11-E-071218-1 | Sampled: 7/12/2018 08:38

Sample ID: 18G0509-51

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.7		% Wt	1		SM 2540G	7/17/18	7/18/18 14:28	JFC

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AB13-A-071218-1 | Sampled: 7/12/2018 09:17

Sample ID: 18G0509-52

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	12	µg/kg	25	V-05	EPA 680 Modified	7/17/18	7/26/18 19:36	IMR
Dichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 19:36	IMR
Trichlorobiphenyls	ND	12	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 19:36	IMR
Tetrachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 19:36	IMR
Pentachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 19:36	IMR
Hexachlorobiphenyls	ND	24	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 19:36	IMR
Heptachlorobiphenyls	ND	37	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 19:36	IMR
Octachlorobiphenyls	ND	37	µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 19:36	IMR
Nonachlorobiphenyls	ND	61	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 19:36	IMR
Decachlorobiphenyl	ND	61	µg/kg	25	V-20	EPA 680 Modified	7/17/18	7/26/18 19:36	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	25		EPA 680 Modified	7/17/18	7/26/18 19:36	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual			
Tetrachloro-m-xylene	105	50-125				7/26/18 19:36

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AB13-A-071218-1 | Sampled: 7/12/2018 09:17

Sample ID: 18G0509-52

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.5		% Wt	1		SM 2540G	7/17/18	7/18/18 14:28	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AB13-B-071218-1 | Sampled: 7/12/2018 09:14

Sample ID: 18G0509-53

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	48	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 12:34	IMR
Dichlorobiphenyls	ND	48	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 12:34	IMR
Trichlorobiphenyls	ND	48	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 12:34	IMR
Tetrachlorobiphenyls	ND	95	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 12:34	IMR
Pentachlorobiphenyls	ND	95	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 12:34	IMR
Hexachlorobiphenyls	ND	95	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 12:34	IMR
Heptachlorobiphenyls	ND	140	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 12:34	IMR
Octachlorobiphenyls	ND	140	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 12:34	IMR
Nonachlorobiphenyls	ND	240	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 12:34	IMR
Decachlorobiphenyl	ND	240	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 12:34	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 12:34	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	112	50-125				7/27/18 12:34	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AB13-B-071218-1 | Sampled: 7/12/2018 09:14

Sample ID: 18G0509-53

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.2		% Wt	1		SM 2540G	7/17/18	7/18/18 14:29	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AB13-E-071218-1 | Sampled: 7/12/2018 09:22

Sample ID: 18G0509-54

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:08	KAL
Aroclor-1221 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:08	KAL
Aroclor-1232 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:08	KAL
Aroclor-1242 [2]	0.15	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:08	KAL
Aroclor-1248 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:08	KAL
Aroclor-1254 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:08	KAL
Aroclor-1260 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:08	KAL
Aroclor-1262 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:08	KAL
Aroclor-1268 [1]	ND	0.085	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:08	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	72.0	30-150		7/20/18 23:08
Decachlorobiphenyl [2]	80.6	30-150		7/20/18 23:08
Tetrachloro-m-xylene [1]	82.4	30-150		7/20/18 23:08
Tetrachloro-m-xylene [2]	82.5	30-150		7/20/18 23:08

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AB13-E-071218-1 | Sampled: 7/12/2018 09:22

Sample ID: 18G0509-54

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.0		% Wt	1		SM 2540G	7/17/18	7/18/18 14:29	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AD14-A-071218-1 | Sampled: 7/12/2018 08:53

Sample ID: 18G0509-55

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	45	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:11	IMR
Dichlorobiphenyls	ND	45	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:11	IMR
Trichlorobiphenyls	ND	45	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:11	IMR
Tetrachlorobiphenyls	ND	90	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:11	IMR
Pentachlorobiphenyls	ND	90	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:11	IMR
Hexachlorobiphenyls	ND	90	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:11	IMR
Heptachlorobiphenyls	ND	140	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:11	IMR
Octachlorobiphenyls	ND	140	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:11	IMR
Nonachlorobiphenyls	ND	230	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:11	IMR
Decachlorobiphenyl	ND	230	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:11	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:11	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	112	50-125				7/27/18 13:11	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AD14-A-071218-1 | Sampled: 7/12/2018 08:53

Sample ID: 18G0509-55

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.3		% Wt	1		SM 2540G	7/17/18	7/18/18 14:29	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AD14-B-071218-1 | Sampled: 7/12/2018 08:54

Sample ID: 18G0509-56

Sample Matrix: Product/Solid

Sample Flags: RL-12

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	44	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:49	IMR
Dichlorobiphenyls	ND	44	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:49	IMR
Trichlorobiphenyls	ND	44	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:49	IMR
Tetrachlorobiphenyls	ND	87	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:49	IMR
Pentachlorobiphenyls	ND	87	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:49	IMR
Hexachlorobiphenyls	ND	87	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:49	IMR
Heptachlorobiphenyls	ND	130	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:49	IMR
Octachlorobiphenyls	ND	130	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:49	IMR
Nonachlorobiphenyls	ND	220	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:49	IMR
Decachlorobiphenyl	ND	220	µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:49	IMR
Total Polychlorinated biphenyls	0.0		µg/kg	100		EPA 680 Modified	7/17/18	7/27/18 13:49	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual				
Tetrachloro-m-xylene	102	50-125				7/27/18 13:49	

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Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AD14-B-071218-1 | Sampled: 7/12/2018 08:54

Sample ID: 18G0509-56

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	99.2		% Wt	1		SM 2540G	7/17/18	7/18/18 14:29	JFC

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AD14-E-071218-1 | Sampled: 7/12/2018 08:56

Sample ID: 18G0509-57

Sample Matrix: Soil

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:26	KAL
Aroclor-1221 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:26	KAL
Aroclor-1232 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:26	KAL
Aroclor-1242 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:26	KAL
Aroclor-1248 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:26	KAL
Aroclor-1254 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:26	KAL
Aroclor-1260 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:26	KAL
Aroclor-1262 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:26	KAL
Aroclor-1268 [1]	ND	0.088	mg/Kg dry	4		SW-846 8082A	7/18/18	7/20/18 23:26	KAL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	69.9	30-150		7/20/18 23:26
Decachlorobiphenyl [2]	79.3	30-150		7/20/18 23:26
Tetrachloro-m-xylene [1]	81.4	30-150		7/20/18 23:26
Tetrachloro-m-xylene [2]	81.1	30-150		7/20/18 23:26

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Greenwich, CT | Sample Description: | Work Order: 18G0509

Date Received: 7/13/2018

Field Sample #: AD14-E-071218-1 | Sampled: 7/12/2018 08:56

Sample ID: 18G0509-57

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.9		% Wt	1		SM 2540G	7/17/18	7/18/18 14:29	JFC

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: SW-846 3540C-EPA 680 Modified

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
18G0509-01 [AT20-A-071118-1]	B208010	2.07	1.00	07/17/18
18G0509-02 [AT20-B-071118-1]	B208010	2.76	1.00	07/17/18
18G0509-04 [AP15-A-071118-1]	B208010	2.08	1.00	07/17/18
18G0509-05 [AP15-B-071118-1]	B208010	2.42	1.00	07/17/18
18G0509-07 [AJ13R-A-071118-1]	B208010	2.16	1.00	07/17/18
18G0509-08 [AJ13R-B-071118-1]	B208010	2.18	1.00	07/17/18
18G0509-10 [AJ13B-A-071118-1]	B208010	2.20	1.00	07/17/18
18G0509-11 [AJ13B-B-071118-1]	B208010	2.10	1.00	07/17/18
18G0509-13 [AJ13D-A-071118-1]	B208010	2.06	1.00	07/17/18
18G0509-14 [AJ13D-B-071118-1]	B208010	2.30	1.00	07/17/18
18G0509-16 [AH10-A-071118-1]	B208010	2.06	1.00	07/17/18
18G0509-17 [AH10-B-071118-1]	B208010	2.06	1.00	07/17/18
18G0509-19 [AG12-A-071118-1]	B208010	2.09	1.00	07/17/18
18G0509-20 [AG12-B-071118-1]	B208010	2.41	1.00	07/17/18
18G0509-22 [AJ12-A-071118-1]	B208010	2.18	1.00	07/17/18
18G0509-23 [AJ12-B-071118-1]	B208010	2.19	1.00	07/17/18
18G0509-25 [AJ13A-A-071118-1]	B208010	2.10	1.00	07/17/18
18G0509-26 [AJ13A-B-071118-1]	B208010	2.31	1.00	07/17/18
18G0509-28 [AP14-A-071118-1]	B208010	2.04	1.00	07/17/18
18G0509-31 [AM13-A-071118-1]	B208010	2.14	1.00	07/17/18

Prep Method: SW-846 3540C-EPA 680 Modified

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
18G0509-29 [AP14-B-071118-1]	B208020	2.84	1.00	07/17/18
18G0509-32 [AM13-B-071118-1]	B208020	2.34	1.00	07/17/18
18G0509-34 [AJ15-A-071118-1]	B208020	2.17	1.00	07/17/18
18G0509-35 [AJ15-B-071118-1]	B208020	2.04	1.00	07/17/18
18G0509-37 [AJ13C-A-071118-1]	B208020	2.05	1.00	07/17/18
18G0509-38 [AJ13C-B-071118-1]	B208020	2.28	1.00	07/17/18
18G0509-40 [DUP 20180711-A]	B208020	2.08	1.00	07/17/18
18G0509-41 [DUP 20180711-B]	B208020	2.17	1.00	07/17/18
18G0509-43 [AC9-A-071218-1]	B208020	2.07	1.00	07/17/18
18G0509-44 [AC9-B-071218-1]	B208020	2.43	1.00	07/17/18
18G0509-46 [AA10-A-071218-1]	B208020	2.14	1.00	07/17/18
18G0509-47 [AA10-B-071218-1]	B208020	2.26	1.00	07/17/18
18G0509-49 [AD11-A-071218-1]	B208020	2.05	1.00	07/17/18
18G0509-50 [AD11-B-071218-1]	B208020	2.28	1.00	07/17/18
18G0509-52 [AB13-A-071218-1]	B208020	2.05	1.00	07/17/18
18G0509-53 [AB13-B-071218-1]	B208020	2.10	1.00	07/17/18
18G0509-55 [AD14-A-071218-1]	B208020	2.22	1.00	07/17/18
18G0509-56 [AD14-B-071218-1]	B208020	2.29	1.00	07/17/18

Prep Method: SW-846 3540C-EPA 680 Modified

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
18G0509-49RE1 [AD11-A-071218-1]	B208876	2.27	1.00	07/27/18

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
18G0509-01 [AT20-A-071118-1]	B208111	07/17/18
18G0509-02 [AT20-B-071118-1]	B208111	07/17/18
18G0509-03 [AT20-E-071118-1]	B208111	07/17/18
18G0509-04 [AP15-A-071118-1]	B208111	07/17/18
18G0509-05 [AP15-B-071118-1]	B208111	07/17/18
18G0509-06 [AP15-E-071118-1]	B208111	07/17/18
18G0509-07 [AJ13R-A-071118-1]	B208111	07/17/18
18G0509-08 [AJ13R-B-071118-1]	B208111	07/17/18
18G0509-09 [AJ13R-E-071118-1]	B208111	07/17/18
18G0509-10 [AJ13B-A-071118-1]	B208111	07/17/18
18G0509-11 [AJ13B-B-071118-1]	B208111	07/17/18
18G0509-12 [AJ13B-E-071118-1]	B208111	07/17/18
18G0509-13 [AJ13D-A-071118-1]	B208111	07/17/18
18G0509-14 [AJ13D-B-071118-1]	B208111	07/17/18
18G0509-15 [AJ13D-E-071118-1]	B208111	07/17/18
18G0509-16 [AH10-A-071118-1]	B208111	07/17/18
18G0509-17 [AH10-B-071118-1]	B208111	07/17/18
18G0509-18 [AH10-E-071118-1]	B208111	07/17/18
18G0509-19 [AG12-A-071118-1]	B208111	07/17/18
18G0509-20 [AG12-B-071118-1]	B208111	07/17/18
18G0509-21 [AG12-E-071118-1]	B208111	07/17/18
18G0509-22 [AJ12-A-071118-1]	B208111	07/17/18
18G0509-23 [AJ12-B-071118-1]	B208111	07/17/18
18G0509-24 [AJ12-E-071118-1]	B208111	07/17/18
18G0509-25 [AJ13A-A-071118-1]	B208111	07/17/18
18G0509-26 [AJ13A-B-071118-1]	B208111	07/17/18
18G0509-27 [AJ13A-E-071118-1]	B208111	07/17/18
18G0509-28 [AP14-A-071118-1]	B208111	07/17/18
18G0509-29 [AP14-B-071118-1]	B208111	07/17/18
18G0509-30 [AP14-E-071118-1]	B208111	07/17/18
18G0509-31 [AM13-A-071118-1]	B208111	07/17/18
18G0509-32 [AM13-B-071118-1]	B208111	07/17/18
18G0509-33 [AM13-E-071118-1]	B208111	07/17/18
18G0509-34 [AJ15-A-071118-1]	B208111	07/17/18
18G0509-35 [AJ15-B-071118-1]	B208111	07/17/18
18G0509-36 [AJ15-E-071118-1]	B208111	07/17/18
18G0509-37 [AJ13C-A-071118-1]	B208111	07/17/18
18G0509-38 [AJ13C-B-071118-1]	B208111	07/17/18
18G0509-39 [AJ13C-E-071118-1]	B208111	07/17/18
18G0509-40 [DUP 20180711-A]	B208111	07/17/18
18G0509-41 [DUP 20180711-B]	B208111	07/17/18
18G0509-42 [DUP 20180711-E]	B208111	07/17/18
18G0509-43 [AC9-A-071218-1]	B208111	07/17/18
18G0509-44 [AC9-B-071218-1]	B208111	07/17/18
18G0509-45 [AC9-E-071218-1]	B208111	07/17/18
18G0509-46 [AA10-A-071218-1]	B208111	07/17/18
18G0509-47 [AA10-B-071218-1]	B208111	07/17/18
18G0509-48 [AA10-E-071218-1]	B208111	07/17/18
18G0509-49 [AD11-A-071218-1]	B208111	07/17/18
18G0509-50 [AD11-B-071218-1]	B208111	07/17/18
18G0509-51 [AD11-E-071218-1]	B208111	07/17/18
18G0509-52 [AB13-A-071218-1]	B208111	07/17/18
18G0509-53 [AB13-B-071218-1]	B208111	07/17/18
18G0509-54 [AB13-E-071218-1]	B208111	07/17/18
18G0509-55 [AD14-A-071218-1]	B208111	07/17/18

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
18G0509-56 [AD14-B-071218-1]	B208111	07/17/18
18G0509-57 [AD14-E-071218-1]	B208111	07/17/18

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
18G0509-03 [AT20-E-071118-1]	B208235	10.4	10.0	07/18/18
18G0509-06 [AP15-E-071118-1]	B208235	10.0	10.0	07/18/18
18G0509-09 [AJ13R-E-071118-1]	B208235	10.3	10.0	07/18/18
18G0509-12 [AJ13B-E-071118-1]	B208235	10.1	10.0	07/18/18
18G0509-15 [AJ13D-E-071118-1]	B208235	10.4	10.0	07/18/18
18G0509-18 [AH10-E-071118-1]	B208235	10.5	10.0	07/18/18
18G0509-21 [AG12-E-071118-1]	B208235	10.0	10.0	07/18/18
18G0509-24 [AJ12-E-071118-1]	B208235	10.2	10.0	07/18/18
18G0509-27 [AJ13A-E-071118-1]	B208235	10.3	10.0	07/18/18
18G0509-30 [AP14-E-071118-1]	B208235	10.2	10.0	07/18/18
18G0509-33 [AM13-E-071118-1]	B208235	10.2	10.0	07/18/18
18G0509-36 [AJ15-E-071118-1]	B208235	10.1	10.0	07/18/18
18G0509-39 [AJ13C-E-071118-1]	B208235	10.4	10.0	07/18/18
18G0509-42 [DUP 20180711-E]	B208235	10.3	10.0	07/18/18
18G0509-45 [AC9-E-071218-1]	B208235	10.2	10.0	07/18/18
18G0509-48 [AA10-E-071218-1]	B208235	10.0	10.0	07/18/18
18G0509-51 [AD11-E-071218-1]	B208235	10.1	10.0	07/18/18
18G0509-54 [AB13-E-071218-1]	B208235	10.3	10.0	07/18/18
18G0509-57 [AD14-E-071218-1]	B208235	10.0	10.0	07/18/18

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QUALITY CONTROL

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B208010 - SW-846 3540C										
Blank (B208010-BLK1)				Prepared: 07/17/18 Analyzed: 07/20/18						
Monochlorobiphenyls	ND	0.50	µg/kg							
Dichlorobiphenyls	ND	0.50	µg/kg							
Trichlorobiphenyls	ND	0.50	µg/kg							
Tetrachlorobiphenyls	ND	1.0	µg/kg							
Pentachlorobiphenyls	ND	1.0	µg/kg							
Hexachlorobiphenyls	ND	1.0	µg/kg							
Heptachlorobiphenyls	ND	1.5	µg/kg							
Octachlorobiphenyls	ND	1.5	µg/kg							
Nonachlorobiphenyls	ND	2.5	µg/kg							
Decachlorobiphenyl	ND	2.5	µg/kg							
Total Polychlorinated biphenyls	0.0		µg/kg							
Surrogate: Tetrachloro-m-xylene	*75.0*		µg/kg	100		75.0	50-125			
LCS (B208010-BS1)				Prepared: 07/17/18 Analyzed: 07/19/18						
Monochlorobiphenyls	58	0.50	µg/kg	100		58.0	40-140			
Dichlorobiphenyls	75	0.50	µg/kg	100		75.1	40-140			
Trichlorobiphenyls	76	0.50	µg/kg	100		76.2	40-140			
Tetrachlorobiphenyls	150	1.0	µg/kg	200		77.0	40-140			
Pentachlorobiphenyls	180	1.0	µg/kg	200		88.2	40-140			
Hexachlorobiphenyls	150	1.0	µg/kg	200		73.5	40-140			
Heptachlorobiphenyls	220	1.5	µg/kg	300		72.9	40-140			
Octachlorobiphenyls	220	1.5	µg/kg	300		73.6	40-140			
Nonachlorobiphenyls	400	2.5	µg/kg	500		80.3	40-140			
Decachlorobiphenyl	420	2.5	µg/kg	500		84.9	40-140			
Surrogate: Tetrachloro-m-xylene	*59.8*		µg/kg	100		59.8	50-125			
LCS Dup (B208010-BSD1)				Prepared: 07/17/18 Analyzed: 07/19/18						
Monochlorobiphenyls	65	0.50	µg/kg	100		65.3	40-140	11.7	50	
Dichlorobiphenyls	77	0.50	µg/kg	100		76.7	40-140	2.11	50	
Trichlorobiphenyls	73	0.50	µg/kg	100		73.5	40-140	3.62	50	
Tetrachlorobiphenyls	150	1.0	µg/kg	200		74.3	40-140	3.58	50	
Pentachlorobiphenyls	160	1.0	µg/kg	200		82.2	40-140	7.05	50	
Hexachlorobiphenyls	140	1.0	µg/kg	200		67.9	40-140	7.93	50	
Heptachlorobiphenyls	200	1.5	µg/kg	300		67.2	40-140	8.08	50	
Octachlorobiphenyls	200	1.5	µg/kg	300		67.8	40-140	8.20	50	
Nonachlorobiphenyls	370	2.5	µg/kg	500		73.6	40-140	8.62	50	
Decachlorobiphenyl	390	2.5	µg/kg	500		77.3	40-140	9.37	50	
Surrogate: Tetrachloro-m-xylene	*65.5*		µg/kg	100		65.5	50-125			
Batch B208020 - SW-846 3540C										
Blank (B208020-BLK1)				Prepared: 07/17/18 Analyzed: 07/25/18						
Monochlorobiphenyls	ND	0.50	µg/kg							
Dichlorobiphenyls	ND	0.50	µg/kg							
Trichlorobiphenyls	ND	0.50	µg/kg							
Tetrachlorobiphenyls	ND	1.0	µg/kg							
Pentachlorobiphenyls	ND	1.0	µg/kg							V-20
Hexachlorobiphenyls	ND	1.0	µg/kg							V-20
Heptachlorobiphenyls	ND	1.5	µg/kg							V-20
Octachlorobiphenyls	ND	1.5	µg/kg							V-20
Nonachlorobiphenyls	ND	2.5	µg/kg							V-20
Decachlorobiphenyl	ND	2.5	µg/kg							V-20
Total Polychlorinated biphenyls	0.0		µg/kg							

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QUALITY CONTROL

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B208020 - SW-846 3540C										
Blank (B208020-BLK1)				Prepared: 07/17/18 Analyzed: 07/25/18						
Surrogate: Tetrachloro-m-xylene	*74.0*		µg/kg	100		74.0	50-125			
LCS (B208020-BS1)				Prepared: 07/17/18 Analyzed: 07/25/18						
Monochlorobiphenyls	71	0.50	µg/kg	100		70.9	40-140			
Dichlorobiphenyls	84	0.50	µg/kg	100		84.5	40-140			
Trichlorobiphenyls	83	0.50	µg/kg	100		82.9	40-140			
Tetrachlorobiphenyls	170	1.0	µg/kg	200		84.8	40-140			
Pentachlorobiphenyls	180	1.0	µg/kg	200		92.5	40-140			V-06
Hexachlorobiphenyls	170	1.0	µg/kg	200		83.5	40-140			V-06
Heptachlorobiphenyls	240	1.5	µg/kg	300		79.3	40-140			V-06
Octachlorobiphenyls	240	1.5	µg/kg	300		80.4	40-140			V-06
Nonachlorobiphenyls	430	2.5	µg/kg	500		85.7	40-140			V-06
Decachlorobiphenyl	430	2.5	µg/kg	500		86.0	40-140			V-06
Surrogate: Tetrachloro-m-xylene	*80.7*		µg/kg	100		80.7	50-125			
LCS Dup (B208020-BSD1)				Prepared: 07/17/18 Analyzed: 07/25/18						
Monochlorobiphenyls	67	0.50	µg/kg	100		66.8	40-140	5.99	50	
Dichlorobiphenyls	81	0.50	µg/kg	100		81.2	40-140	3.89	50	
Trichlorobiphenyls	81	0.50	µg/kg	100		80.6	40-140	2.87	50	
Tetrachlorobiphenyls	160	1.0	µg/kg	200		82.0	40-140	3.36	50	
Pentachlorobiphenyls	180	1.0	µg/kg	200		90.1	40-140	2.61	50	V-06
Hexachlorobiphenyls	170	1.0	µg/kg	200		84.6	40-140	1.33	50	V-06
Heptachlorobiphenyls	240	1.5	µg/kg	300		79.8	40-140	0.664	50	V-06
Octachlorobiphenyls	240	1.5	µg/kg	300		81.2	40-140	0.995	50	V-06
Nonachlorobiphenyls	430	2.5	µg/kg	500		86.7	40-140	1.13	50	V-06
Decachlorobiphenyl	430	2.5	µg/kg	500		86.8	40-140	0.971	50	V-06
Surrogate: Tetrachloro-m-xylene	*72.0*		µg/kg	100		72.0	50-125			
Batch B208876 - SW-846 3540C										
Blank (B208876-BLK1)				Prepared: 07/27/18 Analyzed: 07/31/18						
Monochlorobiphenyls	ND	0.45	µg/kg							
Dichlorobiphenyls	ND	0.45	µg/kg							
Trichlorobiphenyls	ND	0.45	µg/kg							
Tetrachlorobiphenyls	ND	0.90	µg/kg							V-20
Pentachlorobiphenyls	ND	0.90	µg/kg							
Hexachlorobiphenyls	ND	0.90	µg/kg							V-20
Heptachlorobiphenyls	ND	1.4	µg/kg							V-20
Octachlorobiphenyls	ND	1.4	µg/kg							V-20
Nonachlorobiphenyls	ND	2.3	µg/kg							
Decachlorobiphenyl	ND	2.3	µg/kg							
Total Polychlorinated biphenyls	0.0		µg/kg							
Surrogate: Tetrachloro-m-xylene	*47.7*		µg/kg	90.1		52.9	50-125			

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QUALITY CONTROL

PCB Homologues by GC/MS (Product/Solid) with Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B208876 - SW-846 3540C										
LCS (B208876-BS1)				Prepared: 07/27/18 Analyzed: 07/31/18						
Monochlorobiphenyls	55	0.46	µg/kg	91.3		60.0	40-140			
Dichlorobiphenyls	70	0.46	µg/kg	91.3		77.0	40-140			
Trichlorobiphenyls	69	0.46	µg/kg	91.3		75.9	40-140			
Tetrachlorobiphenyls	140	0.91	µg/kg	183		77.7	40-140			V-06
Pentachlorobiphenyls	150	0.91	µg/kg	183		80.1	40-140			
Hexachlorobiphenyls	160	0.91	µg/kg	183		85.0	40-140			V-06
Heptachlorobiphenyls	220	1.4	µg/kg	274		80.6	40-140			V-06
Octachlorobiphenyls	220	1.4	µg/kg	274		78.7	40-140			V-06
Nonachlorobiphenyls	350	2.3	µg/kg	457		77.1	40-140			
Decachlorobiphenyl	320	2.3	µg/kg	457		69.7	40-140			
Surrogate: Tetrachloro-m-xylene	*69.8*		µg/kg	91.3		76.5	50-125			
LCS Dup (B208876-BSD1)				Prepared: 07/27/18 Analyzed: 07/31/18						
Monochlorobiphenyls	51	0.45	µg/kg	89.3		56.7	40-140	7.89	50	
Dichlorobiphenyls	60	0.45	µg/kg	89.3		67.3	40-140	15.7	50	
Trichlorobiphenyls	56	0.45	µg/kg	89.3		62.5	40-140	21.5	50	
Tetrachlorobiphenyls	110	0.89	µg/kg	179		63.5	40-140	22.5	50	V-06
Pentachlorobiphenyls	110	0.89	µg/kg	179		64.2	40-140	24.1	50	
Hexachlorobiphenyls	120	0.89	µg/kg	179		67.8	40-140	24.7	50	V-06
Heptachlorobiphenyls	170	1.3	µg/kg	268		62.9	40-140	26.9	50	V-06
Octachlorobiphenyls	170	1.3	µg/kg	268		62.0	40-140	26.0	50	V-06
Nonachlorobiphenyls	280	2.2	µg/kg	446		63.6	40-140	21.5	50	
Decachlorobiphenyl	260	2.2	µg/kg	446		59.4	40-140	18.3	50	
Surrogate: Tetrachloro-m-xylene	*60.3*		µg/kg	89.3		67.5	50-125			

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QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B208235 - SW-846 3540C										
Blank (B208235-BLK1)				Prepared: 07/18/18 Analyzed: 07/20/18						
Aroclor-1016	ND	0.020	mg/Kg wet							
Aroclor-1016 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1221	ND	0.020	mg/Kg wet							
Aroclor-1221 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1232	ND	0.020	mg/Kg wet							
Aroclor-1232 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1242	ND	0.020	mg/Kg wet							
Aroclor-1242 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1248	ND	0.020	mg/Kg wet							
Aroclor-1248 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1254	ND	0.020	mg/Kg wet							
Aroclor-1254 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1260	ND	0.020	mg/Kg wet							
Aroclor-1260 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1262	ND	0.020	mg/Kg wet							
Aroclor-1262 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1268	ND	0.020	mg/Kg wet							
Aroclor-1268 [2C]	ND	0.020	mg/Kg wet							
Surrogate: Decachlorobiphenyl	*0.156*		mg/Kg wet	0.200		77.9	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.167*		mg/Kg wet	0.200		83.6	30-150			
Surrogate: Tetrachloro-m-xylene	*0.149*		mg/Kg wet	0.200		74.6	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.148*		mg/Kg wet	0.200		73.8	30-150			
LCS (B208235-BS1)				Prepared: 07/18/18 Analyzed: 07/20/18						
Aroclor-1016	0.16	0.020	mg/Kg wet	0.200		78.9	40-140			
Aroclor-1016 [2C]	0.15	0.020	mg/Kg wet	0.200		75.8	40-140			
Aroclor-1260	0.15	0.020	mg/Kg wet	0.200		76.7	40-140			
Aroclor-1260 [2C]	0.16	0.020	mg/Kg wet	0.200		78.5	40-140			
Surrogate: Decachlorobiphenyl	*0.162*		mg/Kg wet	0.200		81.0	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.174*		mg/Kg wet	0.200		86.9	30-150			
Surrogate: Tetrachloro-m-xylene	*0.159*		mg/Kg wet	0.200		79.5	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.158*		mg/Kg wet	0.200		79.1	30-150			
LCS Dup (B208235-BSD1)				Prepared: 07/18/18 Analyzed: 07/20/18						
Aroclor-1016	0.18	0.020	mg/Kg wet	0.200		88.8	40-140	11.9	30	
Aroclor-1016 [2C]	0.17	0.020	mg/Kg wet	0.200		86.5	40-140	13.3	30	
Aroclor-1260	0.17	0.020	mg/Kg wet	0.200		85.9	40-140	11.3	30	
Aroclor-1260 [2C]	0.18	0.020	mg/Kg wet	0.200		89.2	40-140	12.8	30	
Surrogate: Decachlorobiphenyl	*0.181*		mg/Kg wet	0.200		90.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.194*		mg/Kg wet	0.200		97.1	30-150			
Surrogate: Tetrachloro-m-xylene	*0.172*		mg/Kg wet	0.200		86.2	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.172*		mg/Kg wet	0.200		86.0	30-150			

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QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B208235 - SW-846 3540C										
Matrix Spike (B208235-MS1)	**Source: 18G0509-03**			Prepared: 07/18/18 Analyzed: 07/20/18						
Aroclor-1016	0.22	0.083	mg/Kg dry	0.207	ND	108	40-140			
Aroclor-1016 [2C]	0.26	0.083	mg/Kg dry	0.207	ND	128	40-140			
Aroclor-1260	0.18	0.083	mg/Kg dry	0.207	ND	85.0	40-140			
Aroclor-1260 [2C]	0.18	0.083	mg/Kg dry	0.207	ND	88.7	40-140			
Surrogate: Decachlorobiphenyl	*0.152*		mg/Kg dry	0.207		73.7	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.161*		mg/Kg dry	0.207		77.9	30-150			
Surrogate: Tetrachloro-m-xylene	*0.167*		mg/Kg dry	0.207		80.7	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.166*		mg/Kg dry	0.207		80.3	30-150			
Matrix Spike Dup (B208235-MSD1)	**Source: 18G0509-03**			Prepared: 07/18/18 Analyzed: 07/20/18						
Aroclor-1016	0.27	0.086	mg/Kg dry	0.215	ND	124	40-140	17.4	50	
Aroclor-1016 [2C]	0.29	0.086	mg/Kg dry	0.215	ND	135	40-140	9.07	50	
Aroclor-1260	0.21	0.086	mg/Kg dry	0.215	ND	96.5	40-140	16.5	50	
Aroclor-1260 [2C]	0.22	0.086	mg/Kg dry	0.215	ND	101	40-140	16.7	50	
Surrogate: Decachlorobiphenyl	*0.182*		mg/Kg dry	0.215		84.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.191*		mg/Kg dry	0.215		88.6	30-150			
Surrogate: Tetrachloro-m-xylene	*0.193*		mg/Kg dry	0.215		90.0	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.195*		mg/Kg dry	0.215		90.8	30-150			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B208111 - % Solids										
Duplicate (B208111-DUP3)	**Source: 18G0509-09**			Prepared: 07/17/18 Analyzed: 07/18/18						
% Solids	89.9		% Wt		89.5			0.409	20	
Duplicate (B208111-DUP4)	**Source: 18G0509-14**			Prepared: 07/17/18 Analyzed: 07/18/18						
% Solids	99.4		% Wt		99.4			0.0381	20	
Duplicate (B208111-DUP5)	**Source: 18G0509-32**			Prepared: 07/17/18 Analyzed: 07/18/18						
% Solids	98.5		% Wt		98.4			0.0761	20	
Duplicate (B208111-DUP6)	**Source: 18G0509-46**			Prepared: 07/17/18 Analyzed: 07/18/18						
% Solids	99.5		% Wt		99.5			0.0231	20	
Duplicate (B208111-DUP7)	**Source: 18G0509-57**			Prepared: 07/17/18 Analyzed: 07/18/18						
% Solids	91.2		% Wt		90.9			0.374	20	

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AT20-E-071118-1

Lab Sample ID: 18G0509-03 Date(s) Analyzed 07/20/2018 07/20/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1248	1	0.000	-0.030	0.030	0.10	
	2	0.000	-0.030	0.030	0.12	18.2

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AJ13R-E-071118-1

Lab Sample ID: 18G0509-09 Date(s) Analyzed 07/22/2018 07/22/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1242	1	0.000	-0.030	0.030	7.0	
	2	0.000	-0.030	0.030	8.5	17.9

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AJ13B-E-071118-1

Lab Sample ID: 18G0509-12 Date(s) Analyzed 07/20/2018 07/20/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1242	1	0.000	-0.030	0.030	0.55	
	2	0.000	-0.030	0.030	0.60	8.7

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AJ13A-E-071118-1

Lab Sample ID: 18G0509-27 Date(s) Analyzed 07/22/2018 07/22/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1242	1	0.000	-0.030	0.030	1.6	
	2	0.000	-0.030	0.030	2.3	35.9

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AP14-E-071118-1

Lab Sample ID: 18G0509-30 Date(s) Analyzed 07/20/2018 07/20/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1254	1	0.000	-0.030	0.030	0.26	
	2	0.000	-0.030	0.030	0.33	23.7
Aroclor-1260	1	0.000	-0.030	0.030	0.27	
	2	0.000	-0.030	0.030	0.28	3.6

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AJ15-E-071118-1

Lab Sample ID: 18G0509-36 Date(s) Analyzed 07/22/2018 07/22/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1242	1	0.000	-0.030	0.030	1.8	
	2	0.000	-0.030	0.030	2.8	43.5

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AJ13C-E-071118-1

Lab Sample ID: 18G0509-39 Date(s) Analyzed 07/20/2018 07/20/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1242	1	0.000	-0.030	0.030	0.24	
	2	0.000	-0.030	0.030	0.27	11.8
Aroclor-1254	1	0.000	-0.030	0.030	0.087	
	2	0.000	-0.030	0.030	0.097	10.9

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

DUP 20180711-E

Lab Sample ID: 18G0509-42 Date(s) Analyzed 07/20/2018 07/20/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1242	1	0.000	-0.030	0.030	0.23	
	2	0.000	-0.030	0.030	0.26	12.2

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AC9-E-071218-1

Lab Sample ID: 18G0509-45 Date(s) Analyzed 07/20/2018 07/20/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1242	1	0.000	-0.030	0.030	0.38	
	2	0.000	-0.030	0.030	0.35	10.8
Aroclor-1254	1	0.000	-0.030	0.030	0.14	
	2	0.000	-0.030	0.030	0.19	30.3

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

AB13-E-071218-1

Lab Sample ID: 18G0509-54 Date(s) Analyzed 07/20/2018 07/20/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1242	1	0.000	-0.030	0.030	0.10	
	2	0.000	-0.030	0.030	0.15	40.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS

Lab Sample ID: B208235-BS1 Date(s) Analyzed 07/20/2018 07/20/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	-0.030	0.030	0.16	
	2	0.000	-0.030	0.030	0.15	6.5
Aroclor-1260	1	0.000	-0.030	0.030	0.15	
	2	0.000	-0.030	0.030	0.16	6.5

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B208235-BSD1 Date(s) Analyzed 07/20/2018 07/20/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	-0.030	0.030	0.18	
	2	0.000	-0.030	0.030	0.17	5.7
Aroclor-1260	1	0.000	-0.030	0.030	0.17	
	2	0.000	-0.030	0.030	0.18	5.7

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

Matrix Spike

Lab Sample ID: B208235-MS1 Date(s) Analyzed 07/20/2018 07/20/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	-0.030	0.030	0.22	
	2	0.000	-0.030	0.030	0.26	16.7
Aroclor-1260	1	0.000	-0.030	0.030	0.18	
	2	0.000	-0.030	0.030	0.18	0.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

Matrix Spike Dup

Lab Sample ID: B208235-MSD1 Date(s) Analyzed 07/20/2018 07/20/2018

Instrument ID (1): ECD 9 Instrument ID (2): ECD 9

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	-0.030	0.030	0.27	
	2	0.000	-0.030	0.030	0.29	7.1
Aroclor-1260	1	0.000	-0.030	0.030	0.21	
	2	0.000	-0.030	0.030	0.22	4.7

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
H-04	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
P-01	Result was confirmed using a dissimilar column. Relative percent difference between the two results was >40%. In accordance with the method, the higher result was reported.
RL-12	Elevated reporting limit due to matrix interference.
S-01	The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.
S-03	Surrogate recovery outside of control limits due to suspected sample matrix interference.
S-10	Sample was re-extracted outside of holding time since surrogate standard recovery was outside of control limits. Data from analysis performed outside of holding time is also reported since surrogate recovery is acceptable.
S-17	Surrogate recovery is outside of control limits. Data validation is not affected since all associated results are less than the reporting limit and bias is on the high side.
V-05	Continuing calibration did not meet method specifications and was biased on the low side for this compound. Reported result is estimated.
V-06	Continuing calibration did not meet method specifications and was biased on the high side for this compound. Reported result is estimated.
V-20	Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8082A in Soil	
Aroclor-1016	CT,NH,NY,ME,NC,VA
Aroclor-1016 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1221	CT,NH,NY,ME,NC,VA
Aroclor-1221 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1232	CT,NH,NY,ME,NC,VA
Aroclor-1232 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1242	CT,NH,NY,ME,NC,VA
Aroclor-1242 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1248	CT,NH,NY,ME,NC,VA
Aroclor-1248 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1254	CT,NH,NY,ME,NC,VA
Aroclor-1254 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1260	CT,NH,NY,ME,NC,VA
Aroclor-1260 [2C]	CT,NH,NY,ME,NC,VA
Aroclor-1262	NY,NC,VA
Aroclor-1262 [2C]	NY,NC,VA
Aroclor-1268	NY,NC,VA
Aroclor-1268 [2C]	NY,NC,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	03/1/2020
MA	Massachusetts DEP	M-MA100	06/30/2019
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2019
NY	New York State Department of Health	10899 NELAP	04/1/2019
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2019
RI	Rhode Island Department of Health	LAO00112	12/30/2018
NC	North Carolina Div. of Water Quality	652	12/31/2018
NJ	New Jersey DEP	MA007 NELAP	06/30/2019
FL	Florida Department of Health	E871027 NELAP	06/30/2019
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2019
ME	State of Maine	2011028	06/9/2019
VA	Commonwealth of Virginia	460217	12/14/2018
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2018
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2019
NC-DW	North Carolina Department of Health	25703	07/31/2019

1860509

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Email: info@contestlabs.com

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CHAIN OF CUSTODY RECORD

Doc # 381 Rev 1_03242017

39 Spruce Street
East Longmeadow, MA 01028

Company Name: AECOM CORP.
Address: 500 ENTERPRISE DR., ROCKY HILL, CT.
Phone: 860-263-5800
Project Name: GREENWICH HIGH SCHOOL
Project Location: GREENWICH, CT.
Project Number: 60432356
Project Manager: MATT R
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By: JOHN CRESPO, KATRINA FRAZER

Requested Turnaround Time
7-Day ☒ 10-Day ☐
Due Date: STANDARD

Rush-Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☑ EXCEL ☑
Other:
CLP Like Data Pkg Required: ☐
Email To: matthew.rood@aecom.com
Fax To #:

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1]Matrix Code	Conc Code	PCB HOMOLOGS (680)	PCB AROCLORS (8082)									
								7	3									
								I	I									
								A	A									
01	AT20-A-071118-1	7/11/18	9:30	—	✓	SOL	U	X										
02	AT20-B-071118-1		9:29	—	✓	SOL	U	X										
03	AT20-E-071118-1		9:34	—	✓	S	U		X									
04	AP15-A-071118-1		9:50	—	✓	SOL	U	X										
05	AP15-B-071118-1		9:53	—	✓	SOL	U	X										
06	AP15-E-071118-1		9:55	—	✓	S	U		X									
07	AJ13R-A-071118-1		12:53	—	✓	SOL	✓	X										
08	AJ13R-B-071118-1		12:50	—	✓	SOL	U	X										
09	AJ13R-E-071118-1		12:55	—	✓	S	U		X									
10	AJ13B-A-071118-1		13:26	—	✓	SOL	U	X										

ANALYSIS REQUESTED

# of Containers
[2] Preservation Code
[3] Container Code

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

Comments: DLs = R DEC
please report dryweights for all samples

Please use the following codes to indicate possible sample concentration within the **Conc Code** column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

[1] **Matrix Codes:**
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] **Preservation Codes:**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] **Container Codes:**
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time: 7-13-18 1225	
Relinquished by: (signature)	Date/Time: " 3:05	
Received by: (signature) Sam Singh 2.4, 2.6	Date/Time: 7/13/18 1505	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Detection Limit Requirements
MA
CT: R DEC
Other:

Special Requirements
☐ MA MCP Required
MCP Certification Form Required
☑ CT RCP Required
RCP Certification Form Required
☐ MA State DW Required
PWSID #

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NELAC and AIHA-LAP, LLC Accredited

Project Entity
☐ Government ☒ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA
RESIDENTIAL

Other
☐ Chromatogram
☐ AIHA-LAP, LLC

PCB ONLY
☒ Soxhlet
☐ Non Soxhlet

Table of Contents

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CHAIN OF CUSTODY RECORD

Doc # 381 Rev 1_03242017

39 Spruce Street
East Longmeadow, MA 01028

Company Name: AECOM CORP
Address:
Phone:
Project Name: GREENFIELD HIGH SCHOOL
Project Location:
Project Number:
Project Manager:
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By:

Requested Turnaround Time
7-Day [X] 10-Day [ ]
Due Date: SAMPLES

Rush Approval Required
1-Day [ ] 3-Day [ ]
2-Day [ ] 4-Day [ ]

Data Delivery
Format: PDF [ ] EXCEL [✓]
Other:
CLP Like Data Pkg Required: [ ]
Email To: Matthew.Lord@aecom.com
Fax To #:

ANALYSIS REQUESTED

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1]Matrix Code	Conc Code	PCB Aroclors (8082)	PCB Homologs (680)	# of Containers	[2] Preservation Code	[3] Container Code
										7	3	
										I	I	
										A	A	
11	AJ13B-B-071118-1	7/11/18	13:28	—	✓	SOL	U		X			
12	AJ13B-E-071118-1		13:28	—	✓	SOL	U	X				
13	AJ13D-A-071118-1		13:40	—	✓	SOL	U		X			
14	AJ13D-B-071118-1		13:38	—	✓	SOL	U		X			
15	AJ13D-E-071118-1		13:44	—	✓	S	U	X				
16	AH10-A-071118-1		14:25	—	✓	SOL	U		X			
17	AH-10-B-071118-1		14:20	—	✓	SOL	U		X			
18	AH-10-E-071118-1		14:23	—	✓	S	U	X				
19	AG12-A-071118-1		14:05	—	✓	SOL	U		X			
20	AG12-B-071118-1		14:09	—	✓	SOL	V		X			

Dissolved Metals Samples
O Field Filtered
O Lab to Filter

Orthophosphate Samples
O Field Filtered
O Lab to Filter

[1] **Matrix Codes:**
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] **Preservation Codes:**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] **Container Codes:**
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Comments:
DLs = R DEC
please report dryweights for all samples

Please use the following codes to indicate possible sample concentration within the **Conc Code** column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time: 7-13-18 12:21	
Relinquished by: (signature)	Date/Time: 3:05	
Received by: (signature)	Date/Time: 7/13/18 1505	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Detection Limit Requirements
MA
CT RDEC
Other:

Special Requirements
[ ] MA MCP Required
MCP Certification Form Required
[✓] CT RCP Required
RCP Certification Form Required
[ ] MA State DW Required
PWSID #

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Project Entity
[ ] Government [X] Municipality [ ] MWRA [ ] WRTA
[ ] Federal [ ] 21 J [ ] School
[ ] City [ ] Brownfield [ ] MBTA

Other
[ ] Chromatogram
[ ] AIHA-LAP,LLC
RESIDENTIAL

PCB ONLY
[X] Soxhlet
[ ] Non Soxhlet

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con-test ANALYTICAL LABORATORY
ALB
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Fax: 413-525-6405
Email: info@contestlabs.com
39 Spruce Street
East Longmeadow, MA 01028

1860509

CHAIN OF CUSTODY RECORD

Company Name: AECOM Corp
Address: Enterprise Dr., Rocky Hill
Phone:
Project Name: Greenwich High School
Project Location:
Project Number:
Project Manager:
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By:

Requested Turnaround Time
7-Day [X] 10-Day [ ]
Due Date: Standard

Rush-Approval Required
1-Day [ ] 3-Day [ ]
2-Day [ ] 4-Day [ ]

Data Delivery
Format: PDF [ ] EXCEL [✓]
Other:
CLP Like Data Pkg Required: [ ]
Email To: mathew.isod@aecom.com
Fax To #:

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1]Matrix Code	Conc Code	PCB Homologs (680)	PCB Aroclors (8082)
21	AG 12-E-071118-1	7/11/18	14:07	—	✓	S	U		X
22	AJ 12-A-071118-1		14:40	—	✓	SOL	U	X	
23	AJ 12-B-071118-1		14:33	—	✓	SOL	U	X	
24	AJ 12-E-071118-1		14:45	—	✓	S	U		X
25	AJ 13A-A-071118-1		13:00	—	✓	SOL	U	X	
26	AJ 13A-B-071118-1		13:03	—	✓	SOL	U	X	
27	AJ 13A-E-071118-1		13:15	—	✓	S	U		X
28	AP 14-A-071118-1		10:13	—	✓	SOL	U	X	
29	AP 14-B-071118-1		10:12	—	✓	SOL	U	X	
30	AP 14-E-071118-1	↓	10:14	—	✓	S	U		X

ANALYSIS REQUESTED

# of Containers	6	4								
[2] Preservation Code	I	I								
[3] Container Code	A	A								

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

Comments:
DL = RDEC
Please report dry weights for all samples

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

[1] **Matrix Codes:**
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] **Preservation Codes:**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] **Container Codes:**
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time: 7-13-18 1225
Relinquished by: (signature)	Date/Time: 305
Received by: (signature)	Date/Time: 7/13/18 1505
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Detection Limit Requirements
MA
RI RDEC
Other

Special Requirements
[ ] MA MCP Required
MCP Certification Form Required
[✓] CT RCP Required
RCP Certification Form Required
[ ] MA State DW Required
PWSID #

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Project Entity
[ ] Government [✓] Municipality [ ] MWRA [ ] WRTA
[ ] Federal [ ] 21 J [ ] School
[ ] City [ ] Brownfield [ ] MBTA

Other
[ ] Chromatogram
[ ] AIHA-LAP,LLC

PCB ONLY
[X] Soxhlet
[ ] Non Soxhlet

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Fax: 413-525-6405
Email: info@contestlabs.com

http://www.contestlabs.com

Doc # 381 Rev 1_03242017

CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Page 4 of 6

Company Name: AECOM CORP
Address:
Phone:
Project Name: GREENFIELD HIGH SCHOOL
Project Location:
Project Number:
Project Manager:
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By:

Requested Turnaround Time
7-Day ☒ 10-Day ☐
Due Date: STANDARD

Rush-Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☑ EXCEL ☑
Other:
CLP Like Data Pkg Required: ☐
Email To: matthew.roode@aecom.com
Fax To #:

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	Matrix Code	Conc Code	PCB Homologs (680)	PCB Aroclors (8082)	ANALYSIS REQUESTED	# of Containers	Preservation Code	Container Code
								5	2				
								I	I				
								A	A				
31	AM13-A-071118-1	7/11/18	10:32	—	✓	SOL	U	X			1	1	A
32	AM13-B-071118-1		10:30	—	✓	SOL	U	X			1	1	A
33	AM13-E-071118-1		10:35	—	✓	S	U		X		1	1	A
	~~AM15-A-071118-1~~		~~10:55~~	—	✓	SOL	U	X		JC			
	~~AM15-B-071118-1~~		~~10:44~~	—	✓	SOL	U	X		JC			
	~~AM15-E-071118-1~~		~~10:50~~	—	✓	S	U		X	JC			
34	AJ15-A-071118-1		11:10	—	✓	SOL	U	X			1	1	A
35	AJ15-B-071118-1		11:07	—	✓	SOL	U	X			1	1	A
36	AJ15-E-071118-1		11:17	—	✓	S	U		X		1	1	A
37	AJ13C-A-071118-1		11:38	—	✓	SOL	U	X			1	1	A

Comments:
DLs = R DEC
please report dry weights for all samples

Please use the following codes to indicate possible sample concentration within the **Conc Code** column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

[1] Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] Container Codes:
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time: 7-13-18 1225
Relinquished by: (signature)	Date/Time: " 1305
Received by: (signature)	Date/Time: 7/13/18 1505
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Detection Limit Requirements
MA
CT: R DEC
Other:

Special Requirements
☐ MA MCP Required
MCP Certification Form Required
☑ CT RCP Required
RCP Certification Form Required
☐ MA State DW Required
PWSID #

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NELAC and AIHA-LAP, LLC Accredited

Project Entity
☐ Government ☒ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA

Other
☐ Chromatogram
☐ AIHA-LAP, LLC

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PCB ONLY
☒ Soxhlet
☐ Non Soxhlet

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Doc # 381 Rev 1_03242017

CHAIN OF CUSTODY RECORD

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
39 Spruce Street
East Longmeadow, MA 01028

ALB

Company Name:	AECOM CORP
Address:	
Phone:	
Project Name:	GREENWICH H SCHOOL
Project Location:	
Project Number:	
Project Manager:	
Con-Test Quote Name/Number:	
Invoice Recipient:	
Sampled By:	

Requested Turnaround Time
7-Day ☑ 10-Day ☐
Due Date: STANDARD

Rush-Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☑ EXCEL ☑
Other:
CLP Like Data Pkg Required: ☐
Email To: matthew.rood@aecom.com
Fax To #:

ANALYSIS REQUESTED

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1]Matrix Code	Conc Code	PCB Homologs (680)	PCB Aroclors (8082)
38	AJ13C-B-071118-1	7/11/18	11:34	—	✓	SOL	U	X	
39	AJ13C-E-071118-1	↓	11:50	—	✓	S	U		X
40	DUP 20180711-A	↓	7:00	—	✓	SOL	U	X	
41	DUP 20180711-B	↓	7:00	—	✓	SOL	U	X	
42	DUP 20180711-E	↓	7:00	—	✓	S	U		X
43	AC9-A-071218-1	7/12/18	9:55	—	✓	SOL	U	X	
44	AC9-B-071218-1	↓	9:56	—	✓	SOL	U	X	
45	AC9-E-071218-1	↓	10:01	—	✓	S	U		X
46	AA10-A-071218-1	↓	9:35	—	✓	SOL	U	X	
47	AA10-B-071218-1	↓	9:37	—	✓	SOL	U	X	

# of Containers	
[2] Preservation Code	
[3] Container Code	

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

[1] **Matrix Codes:**
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] **Preservation Codes:**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] **Container Codes:**
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Comments:
DLs = R DEC
Please report dryweights for all samples

Please use the following codes to indicate possible sample concentration within the **Conc Code** column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time: 7-13-18 1225
Relinquished by: (signature)	Date/Time: " 3:05
Received by: (signature) Sam Einzig 2.4, 2.6	Date/Time: 7/13/18 1505
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Detection Limit Requirements
MA
CT R DEC
Other:

Special Requirements
☐ MA MCP Required
MCP Certification Form Required
☑ CT RCP Required
RCP Certification Form Required
☐ MA State DW Required
PWSID #

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Project Entity
☐ Government ☒ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA RESIDENTIAL

Other
☐ Chromatogram
☐ AIHA-LAP, LLC

PCB ONLY
☒ Soxhlet
☐ Non Soxhlet

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Email: info@contestlabs.com

http://www.contestlabs.com

CHAIN OF CUSTODY RECORD

Doc # 381 Rev 1_03242017

39 Spruce Street
East Longmeadow, MA 01028

Company Name: AECOM CORP.
Address:
Phone:
Project Name: GREENWICH HIGH-SCHOOL
Project Location:
Project Number:
Project Manager:
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By:

Requested Turnaround Time
7-Day ☒ 10-Day ☐
Due Date: STANDARD

Rush-Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☒ EXCEL ☒
Other:
CLP Like Data Pkg Required: ☐
Email To: matthew.rood@aecom.com
Fax To #:

ANALYSIS REQUESTED

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1]Matrix Code	Conc Code	PCB Homologs (680)	PCB Aroclors (8082)	# of Containers	[2] Preservation Code	[3] Container Code
48	AA-10-E-071218-1	7/12/18	9:40	—	✓	S	U		X			
49	AD11-A-071218-1	↓	8:35	—	✓	SOL	U	X				
50	AD11-B-071218-1		8:37	—	✓	SOL	U	X				
51	AD11-E-071218-1		8:38	—	✓	S	U		X			
52	AB13-A-071218-1		9:17	—	✓	SOL	U	X				
53	AB13-B-071218-1		9:14	—	✓	SOL	U	X				
54	AB13-E-071218-1		9:22	—	✓	S	U		X			
55	AD14-A-071218-1		8:53	—	✓	SOL	U	X				
56	AD14-B-071218-1		8:54	—	✓	SOL	U	X				
57	AD14-E-071218-1		8:56	—	✓	S	U		X			

Comments:
DLs = R DEC
Please report dryweights for all samples

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

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DW = Drinking Water
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S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] **Preservation Codes:**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] **Container Codes:**
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Relinquished by: (signature)	Date/Time:
Received by: (signature) [signature]	Date/Time: 7-13-18 1225
Relinquished by: (signature) [signature]	Date/Time: " 305
Received by: (signature) [signature] 2.4.2.6	Date/Time: 7/13/18 1505
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Detection Limit Requirements
MA
CT: R DEC
Other:

Special Requirements
☐ MA MCP Required
MCP Certification Form Required
☒ CT RCP Required
RCP Certification Form Required
☐ MA State DW Required
PWSID #

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Project Entity
☐ Government ☒ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA
RESIDENTIAL

Other
☐ Chromatogram
☐ AIHA-LAP, LLC

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con-test® ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client AECOM

Received By SE Date 7/13/18 Time 1505

How were the samples received? In Cooler T No Cooler ____ On Ice T No Ice ____ Direct from Sampling ____ Ambient ____ Melted Ice ____

Were samples within Temperature? 2-6°C T By Gun # 8 Actual Temp - 2.4, 2.6 By Blank # ____ Actual Temp - ____

Was Custody Seal Intact? N/A Were Samples Tampered with? N/A

Was COC Relinquished ? T Does Chain Agree With Samples? F*

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all pertinent Information? Client T Analysis T Sampler Name T Project T ID's T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified? ____

Are there Rushes? F Who was notified? ____

Are there Short Holds? F Who was notified? ____

Is there enough Volume? T

Is there Headspace where applicable? N/A MS/MSD? F

Proper Media/Containers Used? T Is splitting samples required? F

Were trip blanks received? F On COC? F

Do all samples have the proper pH? N/A Acid ____ Base ____

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	57
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

*All 8 oz ambers agree with chain. Received 20 plastic bags. 18 with large squares of artificial turf and 2 containing what looks like pulverized brick. No labels on brick bags. Labels on product/solid bags match with groups of IDs on chain but times don't match. Temp of cooler was 4.4

REASONABLE CONFIDENCE PROTOCOL
LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

Laboratory Name: Con-Test Analytical Laboratory

Client: AECOM Environment - Rocky Hill, CT

Project Location: Greenwich, CT

Project Number: 18G0509

Laboratory Sample ID(s):

18G0509-01 thru 18G0509-57

Sample Date(s):

07/11/2018,
07/12/2018

List RCP Methods Used:

SW-846 8082A

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CTDEP method-specific Reasonable Confidence Protocol documents?	☑ Yes ☐ No
1A	Were the method specified preservation and holding time requirements met?	☑ Yes ☐ No
1B	VPH and EPH Methods only: Was the VPH and EPH method conducted without significant modifications (see Section 11.3 of respective RCP methods)?	☐ Yes ☐ No ☑ N/A
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	☑ Yes ☐ No
3	Were samples received at an appropriate temperature (< 6 degrees C.)?	☑ Yes ☐ No ☐ N/A
4	Were all QA/QC performance criteria specified in the CTDEP Reasonable Confidence Protocol documents achieved?	☐ Yes ☑ No
5A	Were reporting limits specified or referenced on the chain-of-custody?	☑ Yes ☐ No
5B	Were these reporting limits met?	☑ Yes ☐ No
6	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	☑ Yes ☐ No
7	Are project-specific matrix spikes and laboratory duplicates included in this data set?	☑ Yes ☐ No

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A, or #1B is "No", the data package does not meet the requirements for "Reasonable Confidence."
This form may not be altered and all questions must be answered.

Tod E. Kopyscinski

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

Authorized Signature: Tod Kopyscinski **Position:** Laboratory Director

Printed Name: Tod E. Kopyscinski **Date:** 08/01/18

Name of Laboratory: Con-Test Analytical Laboratory

This certification form is to be used for RCP methods only.

Appendix C

AECOM

Well Construction/Boring Log

PROJECT: **GREENWICH HIGH SCHOOL**		SHEET	BORING NO.
SITE LOCATION:	JOB NUMBER: **60432356**	1 of 1	**MW-AA12D**
10 HILLSIDE ROAD	LOCATION:	TOTAL DEPTH:	WEATHER:
GREENWICH, CT 06830	N: 761552.6671 E: 576408.1622	30'	70°F, Sunny
DRILL CONTRACTOR: GLACIER	ENG/GEO: J. CHRISTOPHER		BEGUN: 8/8/2017
DRILL RIG:	DRILLER: A. AUGUSTINE		FINISHED: 8/9/2017
DRILLING METHOD: HOLLOW STEM AUGER			HOLE SIZE:
GROUND WATER (DEPTH/ELEV):		TOP OF ROCK (DEPTH/ELEV): NE	

DEPTH (FT)	SAMPLE RECOVERY	SAMPLE DESCRIPTION	STRATIGRAPHIC DESCRIPTION	WELL CONSTRUCTION
0				Ground Surface (Grass)
1				
2	5'	Precleared by hand to ~5' bgs, not logged. Dry fill	Fill	Top of Grout: 25 gal Water, 5 lb Quickgel, 7X49 lb Bags Portland
3				
4				
5		Medium tight, wet, black, fine to medium SAND, with some Silt, wood, glass present, strong tar odor, stained; PID Readings: 9.7 PPM at 5', 91.2 PPM at 6'	Fill	
6		6-7' Cobble. Augering through. Dry		
7	1.9'			
8		Dry Cobble, no recovery from 7 to 10' bgs	Cobble	
9				
10		(10-10.5') Loose, crushed cobble, no odor, no staining, dry		
11				
12	4.8'	(10.5'-15') Moist, medium tight, brown PEAT, no OST.	Peat (PT)	
13				
14				
15				
16				Top of Bentonite Plug 1x50 lb Bag of 3/8" Holeplug chips
17	4'	Medium loose, wet, gray, SAND, trace silt (in lesnes), no OST.	Well Graded Sand (SW)	
18				Top of Sand Pack; 5.5 x 50 lb bags Filpro #1 Sand
19				
20		(20-21') - SAA		Top of Screen: 10' screen, 0.010 Slot, Schedule 40 PVC
21				
22	34"	(21-25') - SAA, brown, SAND, with some gravel, trace silt, medium tight, wet, no OST.	Well Graded Sand (SW)	
23				
24				
25				
26				
27	31"	First 24" of recovery - SAA	Well Graded Sand (SW)	
28				
29		Last 7" of recovery - Gray, medium tight, medium SAND, w little silt (in lenses), wet, no OST.	Poorly Graded Sand (SP)	
30				Bottom of Boring

AECOM

Well Construction/Boring Log

PROJECT: **GREENWICH HIGH SCHOOL**			SHEET	BORING NO.
SITE LOCATION:	JOB NUMBER: **60432356**		1 of 2	**MW-AJ13D**
10 HILLSIDE ROAD	LOCATION:		TOTAL DEPTH:	WEATHER:
GREENWICH, CT 06830	N: 761532.9268	E: 576772.8645	35'	84°F, sunny
DRILL CONTRACTOR: GLACIER	ENG/GEO: J. CHRISTOPHER			BEGUN: 8/10/2017
DRILL RIG:	DRILLER: A. AUGUSTINE			FINISHED: 8/10/2017
DRILLING METHOD: HOLLOW STEM AUGER				HOLE SIZE:
GROUND WATER (DEPTH/ELEV):		TOP OF ROCK (DEPTH/ELEV): NE		

DEPTH (FT)	SAMPLE RECOVERY	SAMPLE DESCRIPTION	STRATIGRAPHIC DESCRIPTION	WELL CONSTRUCTION
0	5'	Precleared by hand to ~5' bgs, not logged. Dry fill	Fill	Ground Surface (Turf)
1				
2				Grout: 45 gal water, 10 lb Quikgel, 8x47 lb Portland
3				
4				
5	50"	(5'-5.5') medium tight, moist, gray + black SILT with fine to medium sand, no ost		
6		(5.5'-9.75') tight, moist, dark gray SILT with little fine sand, no ost	Silt (ML)	
7				
8				
9		(9.75-10') soft, moist, brown, PEAT, organic odor, no staining	Peat (PT)	
10	24"	loose, wet, medium gray fine to coarse SAND with some fine to medium gravel, trace silt, no OST	Well Graded Sand (SW)	
11				
12				
13				
14				
15	54"	SAA		
16		(16-19.75') - medium tight, moist, brown gray SILT, no ost. ~1" medium SAND lenses at 16.5', 17.5', and 18'.	Silt (ML)	
17				
18				
19		(19.75-20') Loose, wet, fine to coarse SAND with some fine to medium Gravel, no ost	Well Graded Sand (SW)	
20	28"	SAA		
21				Top of Bentonite Plug: 50 lb Bag holeplug 3/8" bentonite chips
22				
23				Top of Sandpack: 6.5x50lb bags Filpro#1 Sand
24		SAA - orange with little Silt, medium loose		
25	13"	SAA	Well Graded Sand (SW)	Top of Screen: 10' 0.010 Slot, Schedule 40 PVC
26				
27				
28				
29				

Well Construction/Boring Log

PROJECT: **GREENWICH HIGH SCHOOL**			SHEET	BORING NO.
SITE LOCATION:	JOB NUMBER: **60432356**		2 of 2	**MW-AJ13D**
10 HILLSIDE ROAD	LOCATION:		TOTAL DEPTH:	WEATHER:
GREENWICH, CT 06830	N: 761532.9268	E: 576772.8645	35'	84°F, sunny
DRILL CONTRACTOR: GLACIER	ENG/GEO: J. CHRISTOPHER			BEGUN: 8/10/2017
DRILL RIG:	DRILLER: A. AUGUSTINE			FINISHED: 8/10/2017
DRILLING METHOD: HOLLOW STEM AUGER				HOLE SIZE:
GROUND WATER (DEPTH/ELEV):		TOP OF ROCK (DEPTH/ELEV):		

DEPTH (FT)	SAMPLE RECOVERY	SAMPLE DESCRIPTION	STRATIGRAPHIC DESCRIPTION	WELL CONSTRUCTION
30	0"	No Recovery		
31				
32				
33				
34				
35				Bottom of Boring

AECOM

Well Construction/Boring Log

PROJECT: **GREENWICH HIGH SCHOOL**			SHEET	BORING NO.
SITE LOCATION:	JOB NUMBER: **60432356**		1 of 1	**MW-AL10**
10 HILLSIDE ROAD	LOCATION:		TOTAL DEPTH:	WEATHER:
GREENWICH, CT 06830	N: 761405.7082	E: 576889.2524	15'	72°F, Sunny
DRILL CONTRACTOR: GLACIER	ENG/GEO: J. CHRISTOPHER			BEGUN: 8/10/2017
DRILL RIG:	DRILLER: A. AUGUSTINE			FINISHED: 8/10/2017
DRILLING METHOD: HOLLOW STEM AUGER				HOLE SIZE:
GROUND WATER (DEPTH/ELEV):		TOP OF ROCK (DEPTH/ELEV): NE		

DEPTH (FT)	SAMPLE RECOVERY	SAMPLE DESCRIPTION	STRATIGRAPHIC DESCRIPTION	WELL CONSTRUCTION
0	5'	Precleared by hand to ~5' bgs, not logged. Dry fill	Fill	Ground Surface (grass)
1				Top of Bentonite Plug: 1x50 lb Bag Holeplug 3/8" Chips - Hydrated
2				
3				Top of Sandpack: 6x50lb bags of Filpro#1 Sand
4				
5	38"	moist, medium loose, medium gray, fine SAND and SILT with little coarse SAND, with little fine to medium gravel, no OST		Top of Screen: 10', 0.010 slot, Schedule 40 PVC
6		wet, loose, brown, fine to coarse SAND with little fine Gravel, with trace Silt, grading gray at 7.5-8', no OST	Well Graded Sand (SW)	
7				
8		medium loose, moist, strong brown PEAT with organic odor , no staining	Peat (PT)	
9				
10	51"	SAA		
11		medium loose, moist, brown gray, SILT, with little fine sand with trace vegetation, no ost	Silt (ML)	
12				
13				
14				
15				Bottom of Boring

AECOM

Well Construction/Boring Log

PROJECT: **GREENWICH HIGH SCHOOL**			SHEET	BORING NO.
SITE LOCATION:	JOB NUMBER: **60432356**		1 of 1	**MW-AM16D**
10 HILLSIDE ROAD	LOCATION:		TOTAL DEPTH:	WEATHER:
GREENWICH, CT 06830	N: 761627.2639	E: 576958.6111	30'	73°F, mostly cloudy
DRILL CONTRACTOR: GLACIER	ENG/GEO: J. CHRISTOPHER			BEGUN: 8/9/2017
DRILL RIG:	DRILLER: A. AUGUSTINE			FINISHED: 8/9/2017
DRILLING METHOD: HOLLOW STEM AUGER				HOLE SIZE:
GROUND WATER (DEPTH/ELEV):		TOP OF ROCK (DEPTH/ELEV): NE		

DEPTH (FT)	SAMPLE RECOVERY	SAMPLE DESCRIPTION	STRATIGRAPHIC DESCRIPTION	WELL CONSTRUCTION
0	5'	Precleared by hand to ~5' bgs, not logged. Dry fill	Fill	Ground Surface (Grass)
1				Backfilled with Native Material
2				
3				
4				
5	44"	Moist, Light gray - dark gray, medium tight, fine SANDS, with trace silt. At 30" - small (~2") poorly sorted, wet, sand lense. No ost	Poorly Graded Sand (SP)	
6				
7				
8				
9				
10	27"	moist, medium tight, dark brown PEAT, silt, no OST, little fine sands	Peat (PT)	
11				
12				
13				
14				
15	58"	moist, medium loose, wet, gray, SAND, trace silt (in lesnes), no ost	Well Graded Sand (SW)	
16				Top of bentonite plug: 1x50 lb bag of 3/8" Holeplug Chips
17				
18				Top of Sand Pack: 5.5x 50 lb bags Filpro #1 Sand
19				
20	45"	medium tight, gray, moist, SILT with trace clay. Bottom 1" poorly sorted gray medium sands, with some Gravel.	Silt (ML)	Top of Screen: 10', 0.010 Slot, Schedule 40 PVC
21				
22				
23				
24				
25	33"	Wet, medium loose, gray, fine-coarse SAND, no ost	Well Graded Sand (SW)	
26				
27				
28				
29				
30				Bottom of Boring

Well Construction/Boring Log

PROJECT: **GREENWICH HIGH SCHOOL**		SHEET	BORING NO.
SITE LOCATION:	JOB NUMBER: **60432356**	1 of 2	**MW-Y9D**
10 HILLSIDE ROAD	LOCATION:	TOTAL DEPTH:	WEATHER:
GREENWICH, CT 06830	N: 761405.6179 E: 576379.2647	33'	73°F, cloudy
DRILL CONTRACTOR: GLACIER	ENG/GEO: J. CHRISTOPHER		BEGUN: 8/8/2017
DRILL RIG:	DRILLER: A. AUGUSTINE		FINISHED: 8/8/2017
DRILLING METHOD: HOLLOW STEM AUGER			HOLE SIZE:
GROUND WATER (DEPTH/ELEV):		TOP OF ROCK (DEPTH/ELEV): 33'	

DEPTH (FT)	SAMPLE RECOVERY	SAMPLE DESCRIPTION	STRATIGRAPHIC DESCRIPTION	WELL CONSTRUCTION
0	5'	Precleared by hand to ~5' bgs, not logged. Dry fill (~0-2.5' bgs) Moist fill (~2.5-5' bgs)	Fill	Ground Surface (grass)
1				Backfilled with native material
2				
3				
4				
5	3'	loose, moist, white + brown, fine to medium SAND + ASH, little coarse sand, trace silt, no ost		
6				
7				
8		medium tight, moist, dark brown, PEAT SILT, with organic matter, with little fine sand, with trace fine gravel, org odor, no ost	Peat (PT)	
9				
10	3.3'	SAA - brown, no Gravel		
11				
12				
13				
14		medium tight, moist, gray, SILT, with little Clay, no mica flakes present	Silt (ML)	
15	4.3'	(15'-15.3') - medium loose, wet, gray, fine SAND, no ost	Poorly Graded Sand (SP)	
16		medium loose, wet, gray, fine to coarse SAND, little fine Gravel, trace Silt (in lensis), no ost, grading fine	Well Graded Sand (SW)	
17				
18				
19				Top of Bentonite Plug Bentonite Plug 1 + 50 lb bags of 3/8" hole plug bentonite chips
20	5'	medium loose, wet, gray, fine to coarse SAND, no ost		
21		medium loose, wet, gray, fine SAND, no ost (21-22.5')	Poorly Graded Sand (SP)	Top of Sand Pack: 6.5 x 50 lb bags Filpro #1 Sand
22		SAA, brown (22.5'-24')		
23				Top of Screen 10' screen, 0.010 Slot, schedule 40 PVC
24		Same as 15.3'-20' - medium tight, brown, moist	Well Graded Sand (SW)	
25	2'	SAA - wet, weathered Bedrock (Gneiss)		
26				
27				
28				
29				

Well Construction/Boring Log

PROJECT: **GREENWICH HIGH SCHOOL**			SHEET	BORING NO.
SITE LOCATION:	JOB NUMBER: **60432356**		2 of 2	**MW-Y9D**
10 HILLSIDE ROAD	LOCATION:		TOTAL DEPTH:	WEATHER:
GREENWICH, CT 06830	N: 761405.6179	E: 576379.2647	33'	84°F, sunny
DRILL CONTRACTOR: GLACIER	ENG/GEO: J. CHRISTOPHER			BEGUN: 8/8/2017
DRILL RIG:	DRILLER: A. AUGUSTINE			FINISHED: 8/8/2017
DRILLING METHOD: HOLLOW STEM AUGER				HOLE SIZE:
GROUND WATER (DEPTH/ELEV):		TOP OF ROCK (DEPTH/ELEV): 33'		

DEPTH (FT)	SAMPLE RECOVERY	SAMPLE DESCRIPTION	STRATIGRAPHIC DESCRIPTION	WELL CONSTRUCTION
30	2.3'	SAA		
31		Moist, medium tight, gray, Fine med, SAND, and Gravel (weathered bedrock), no ost		
32				
33		Refusal at Bedrock 33' bgs.		Bottom of Boring

Well Construction/Boring Log

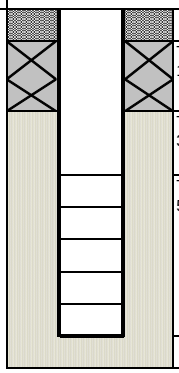
PROJECT: **GREENWICH HIGH SCHOOL**			SHEET	BORING NO.
SITE LOCATION:	JOB NUMBER: **60432356**		1 of 2	**MW-Y15D**
10 HILLSIDE ROAD	LOCATION:		TOTAL DEPTH:	WEATHER:
GREENWICH, CT 06830	N: 761671.8675	E: 576376.7722	40'	73°F, mostly cloudy
DRILL CONTRACTOR: GLACIER	ENG/GEO: J. CHRISTOPHER			BEGUN: 8/11/2017
DRILL RIG:	DRILLER: A. AUGUSTINE			FINISHED: 8/11/2017
DRILLING METHOD: HOLLOW STEM AUGER				HOLE SIZE:
GROUND WATER (DEPTH/ELEV):		TOP OF ROCK (DEPTH/ELEV): NE		

DEPTH (FT)	SAMPLE RECOVERY	SAMPLE DESCRIPTION	STRATIGRAPHIC DESCRIPTION	WELL CONSTRUCTION
0				Ground Surface (Grass)
1	5'	Precleared by hand to ~5' bgs, not logged. Dry fill.	Fill	Grout
2				
3				
4				
5	37"	medium loose, mosit, brown/gray/black, fine to medium SAND and SILT, with some fine gravel, with little wood and glass fragments, no ost.		
6				
7				
8				
9				
10	40"	SAA		
11		medium tight, moist, brown PEAT, organic odor, no staining.	Peat (PT)	
12				
13				
14				
15	49"	SAA		
16				
17				
18				
19				
20	40"			
21				
22				
23				
24				
25	52"			
26				
27				
28				
29		medium tight, moist, brown gray SILT, with little clay, no OST	Silt (ML)	

Well Construction/Boring Log

PROJECT: **GREENWICH HIGH SCHOOL**			SHEET	BORING NO.
SITE LOCATION:	JOB NUMBER: **60432356**		2 of 2	**MW-Y15D**
10 HILLSIDE ROAD	LOCATION:		TOTAL DEPTH:	WEATHER:
GREENWICH, CT 06830	N: 761671.8675	E: 576376.7722	40'	73°F, mostly cloudy
DRILL CONTRACTOR: GLACIER	ENG/GEO: J. CHRISTOPHER			BEGUN: 8/11/2017
DRILL RIG:	DRILLER: A. AUGUSTINE			FINISHED: 8/11/2017
DRILLING METHOD: HOLLOW STEM AUGER				HOLE SIZE:
GROUND WATER (DEPTH/ELEV):		TOP OF ROCK (DEPTH/ELEV):		

DEPTH (FT)	SAMPLE RECOVERY	SAMPLE DESCRIPTION	STRATIGRAPHIC DESCRIPTION	WELL CONSTRUCTION
30	58"	SAA	Silt (ML)	
31				Top of Bentonite Plug: 1x50lb 3/8" Bentonite chips
32				
33				Top of Sandpack: 3.5x50lb Bags Filpro#1 Sand
34				
35	46"	medium loose, wet, gray, fine to coarse SAND, with little fine to medium gravel, no ost.	Well Graded Sand (SW)	Top of Screen: 5', 0.010 Slot, Schedule 40 PVC
36				
37				
38				
39				
40				Bottom of Boring



AECOM

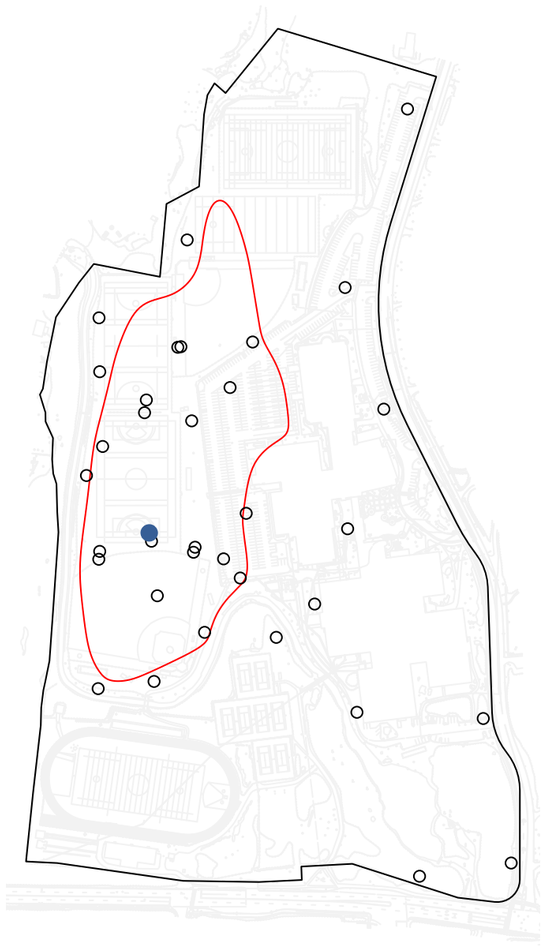
Well Construction/Boring Log

PROJECT: **GREENWICH HIGH SCHOOL**		SHEET	BORING NO.
SITE LOCATION:	JOB NUMBER: **60432356**	1 of 1	**MW-AH16D**
10 HILLSIDE ROAD	LOCATION:	TOTAL DEPTH:	WEATHER:
GREENWICH, CT 06830	N: 761666.791 E: 576749.748	48'	70°F, Sunny
DRILL CONTRACTOR: Martin GeoEnviromental	ENG/GEO: JOHN CRESPO		BEGUN: 6/26/2018
DRILL RIG:	DRILLER: JEREMY MARTIN		FINISHED: 6/26/2018
DRILLING METHOD: HOLLOW STEM AUGER			HOLE SIZE:
GROUND WATER (DEPTH/ELEV):	TOP OF ROCK (DEPTH/ELEV): NE		

DEPTH (FT)	SAMPLE RECOVERY	SAMPLE DESCRIPTION	STRATIGRAPHIC DESCRIPTION	WELL CONSTRUCTION
0		Fine to medium brown SAND, no odor, moist.	Fill	Ground Surface (Pavement)
1				#2 Well Sand
2				Top of Grout
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13		Peat	Peat (PT)	
14				
15				
16				
17				
18				
19				
20				
21				
22				
23		Fine to medium SAND, no odor.	Poorly Graded Sand (SP)	
24				
25				
26				
27				
28				
29				
30				Top of Bentonite Plug 1x50 lb Bag of 3/8" Holeplug chips
31				
32				
33				
34				
35				
36				Top of Sand Pack #2 Well Sand
37				
38				Top of Screen 10' screen, 0.010 slot 2" Schedule 40 PVC
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				Bottom of Boring

Appendix D

Greenwich High School
Shallow Groundwater Temperature and Elevation



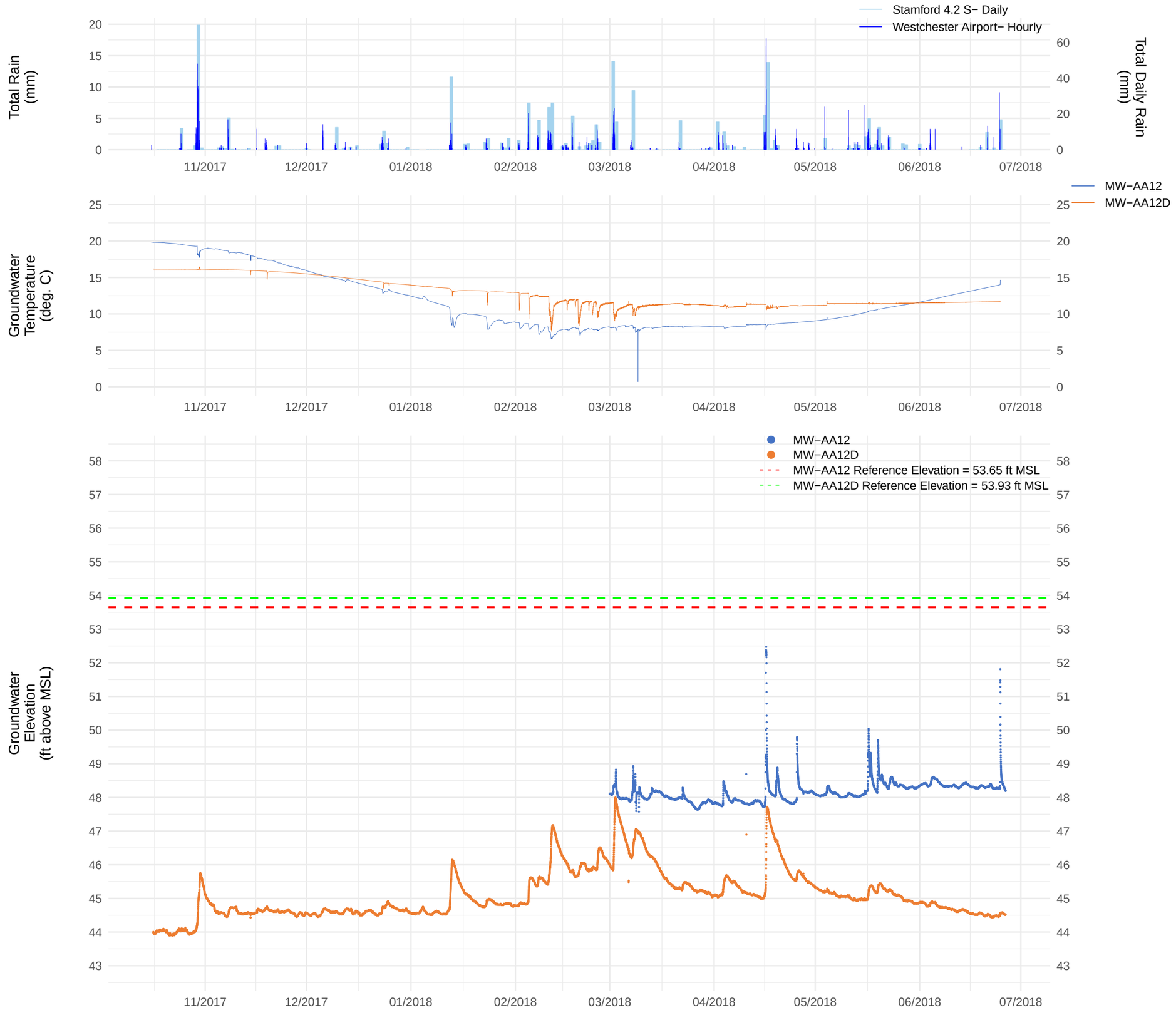
- MW−AA12
- Other Wells



Greenwich High School Shallow/Deep Groundwater Temperature and Elevation

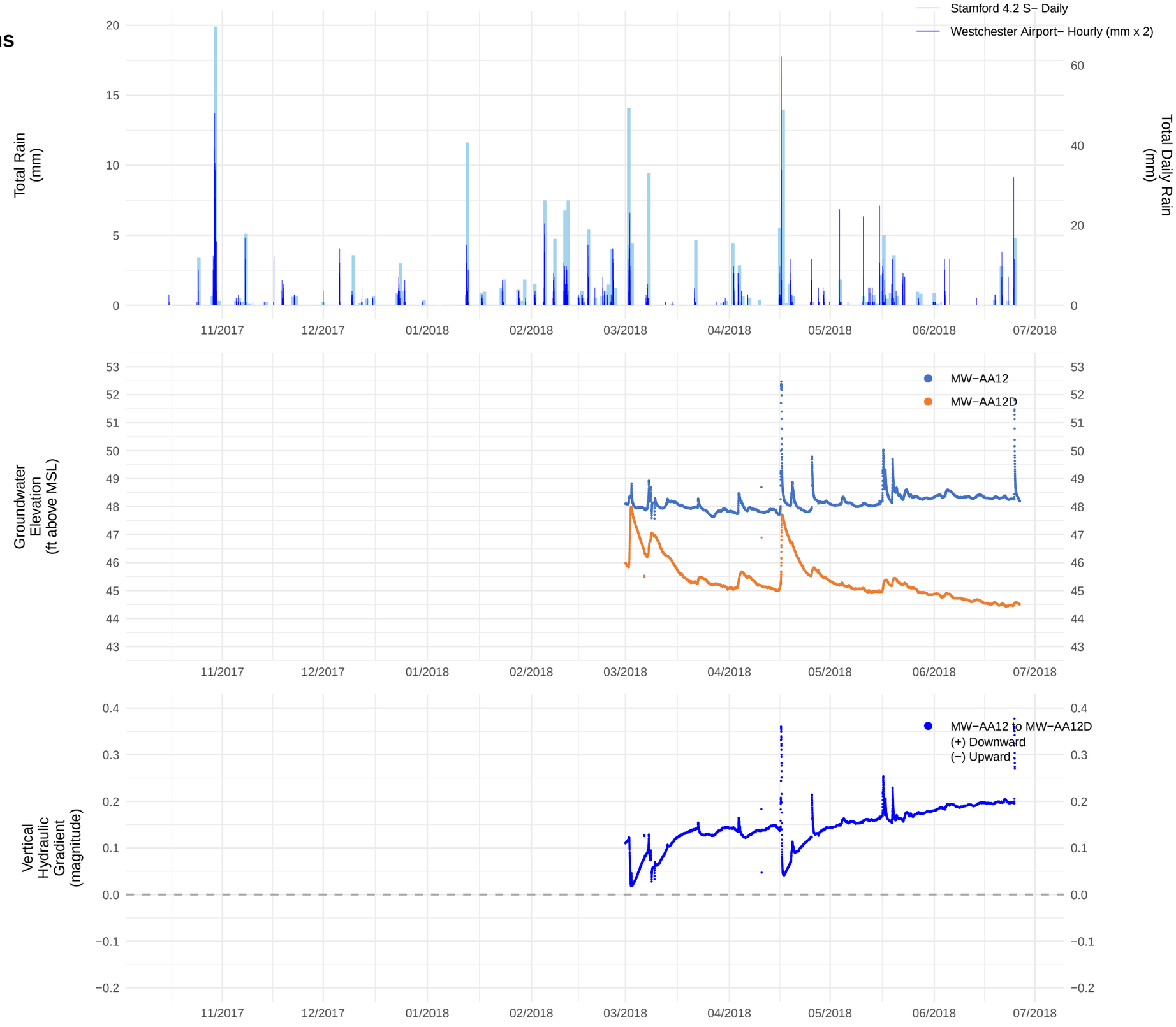


- MW−AA12
- MW−AA12D
- Other Wells

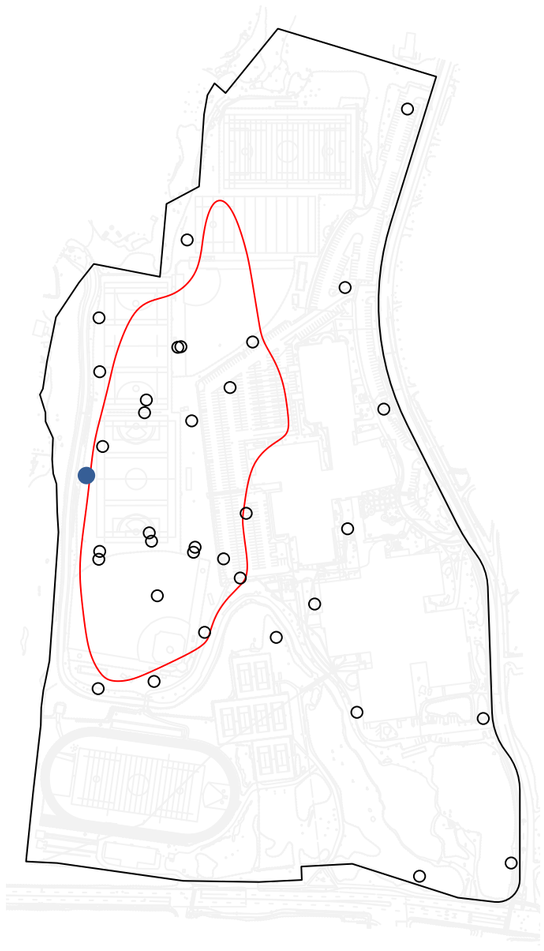


Greenwich High School Monitoring Well Couplet Elevations and Vertical Gradients





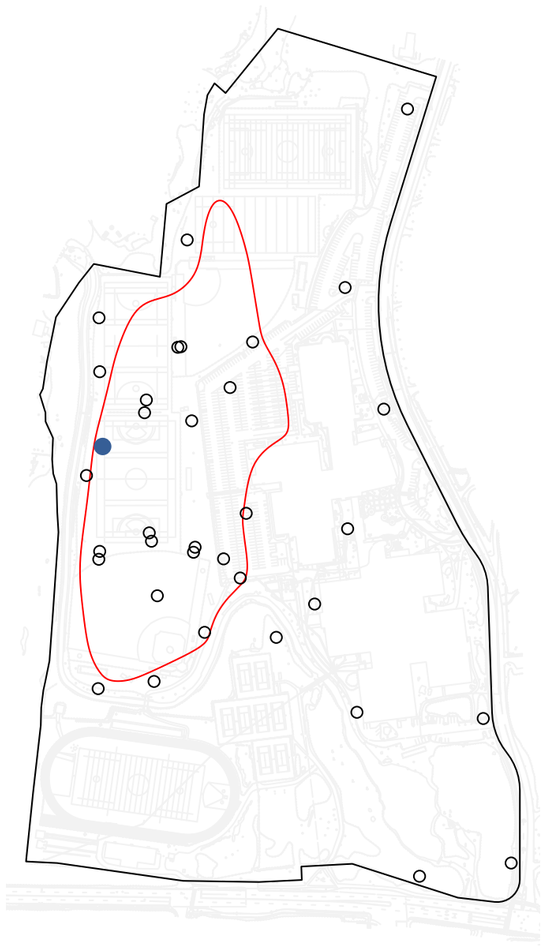
Greenwich High School
Shallow Groundwater Temperature and Elevation



- MW−AE8
- Other Wells



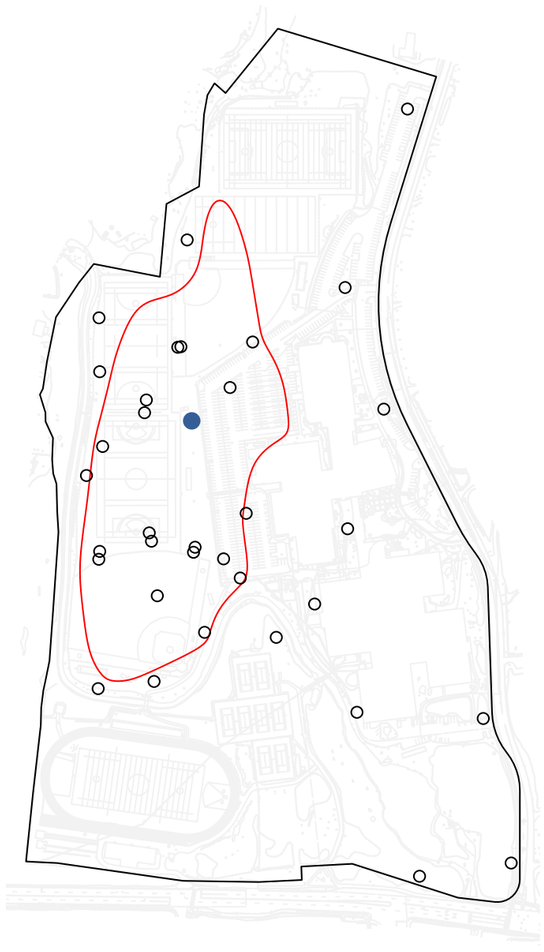
Greenwich High School Shallow Groundwater Temperature and Elevation



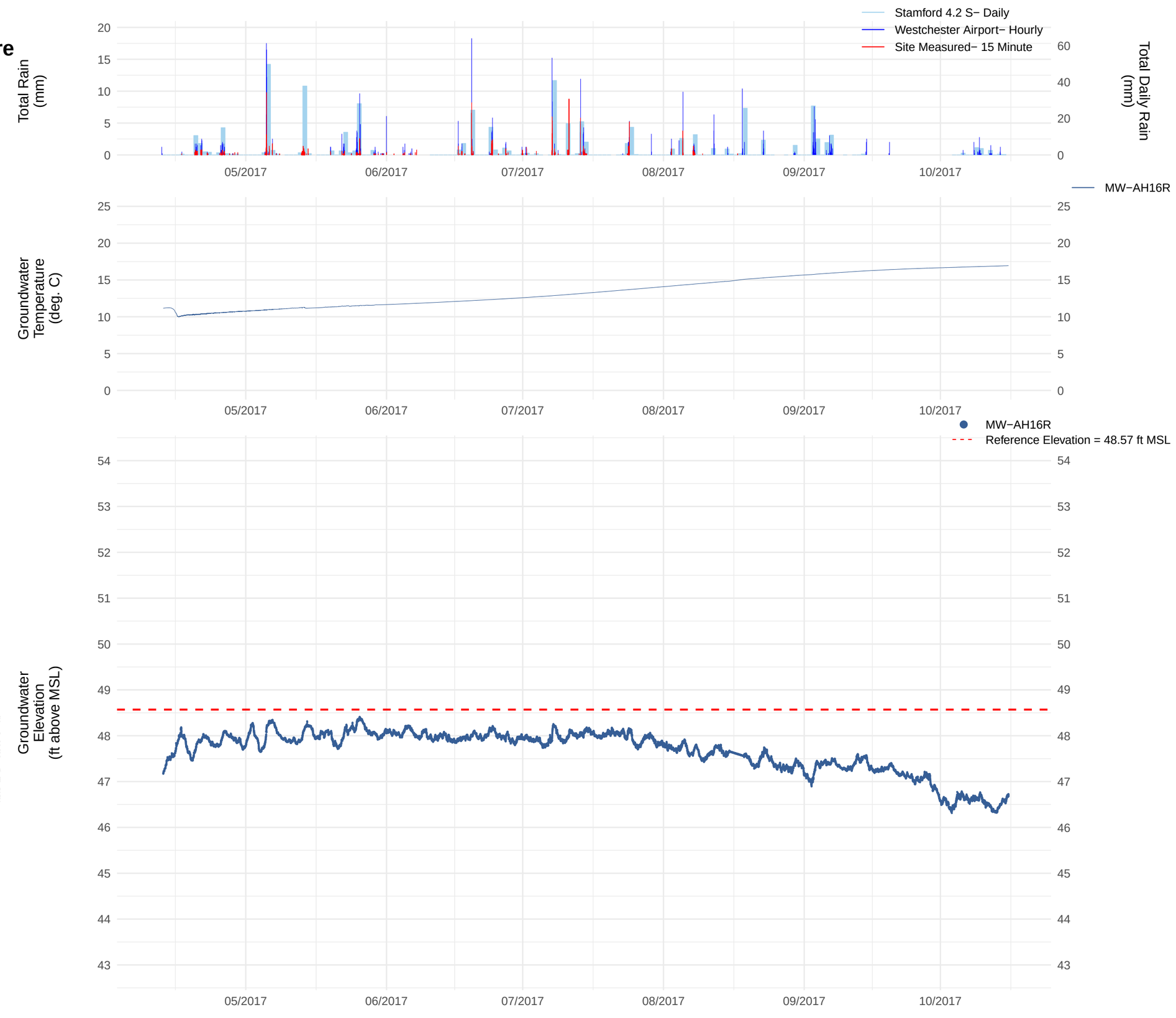
- MW−AG10
- Other Wells



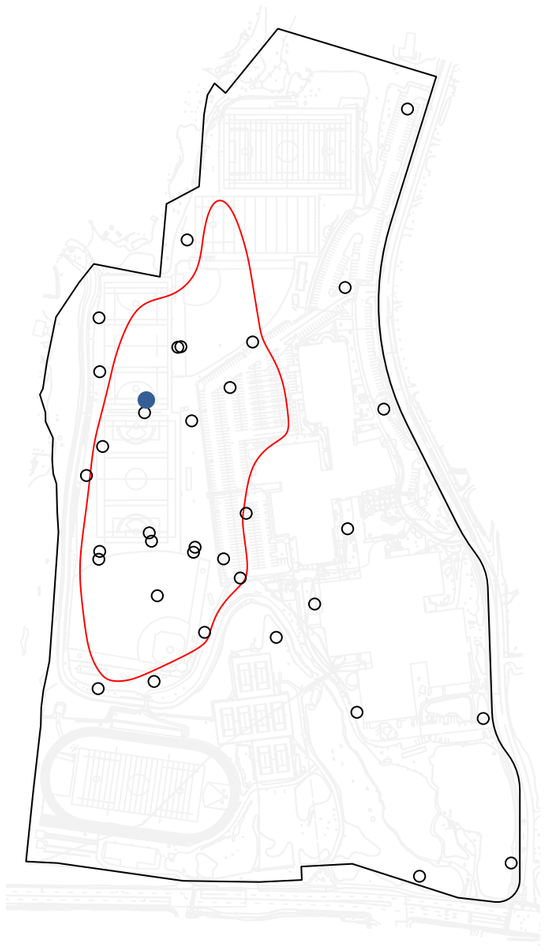
Greenwich High School
Shallow Groundwater Temperature and Elevation



- MW−AH16R
- Other Wells

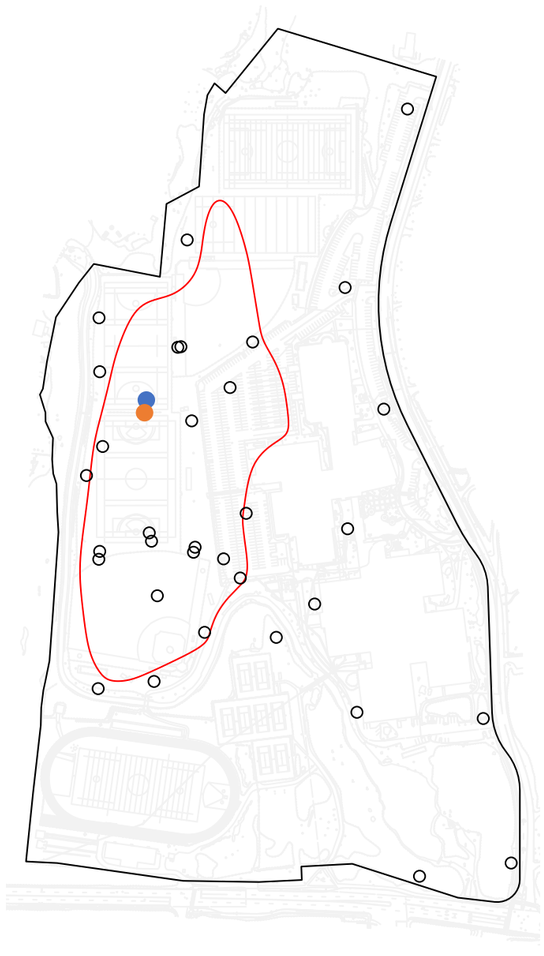


Greenwich High School Shallow Groundwater Temperature and Elevation





Greenwich High School Shallow/Deep Groundwater Temperature and Elevation



MW−AJ13
MW−AJ13D
Other Wells

Total Rain (mm)

Stamford 4.2 S− Daily
Westchester Airport− Hourly

Total Daily Rain (mm)

Groundwater Temperature (deg. C)

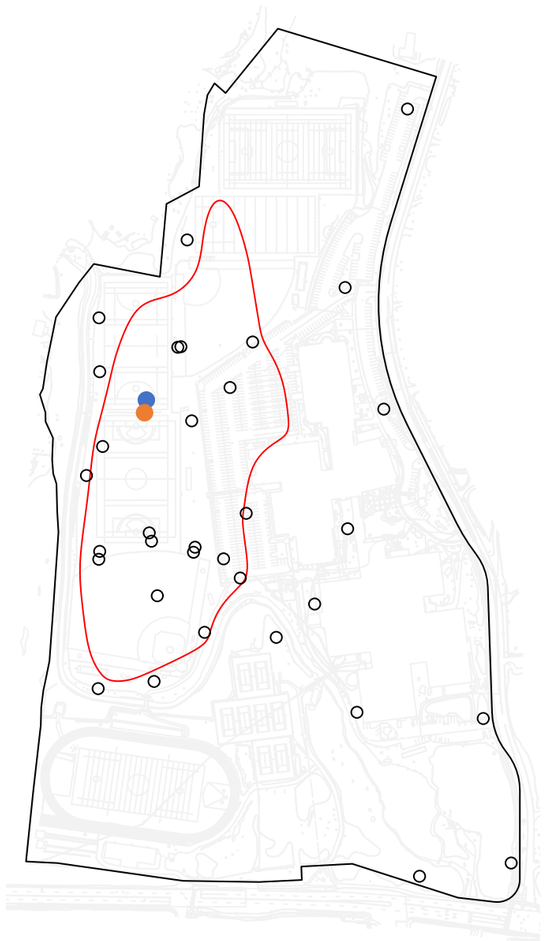
MW−AJ13
MW−AJ13D

Groundwater Elevation (ft above MSL)

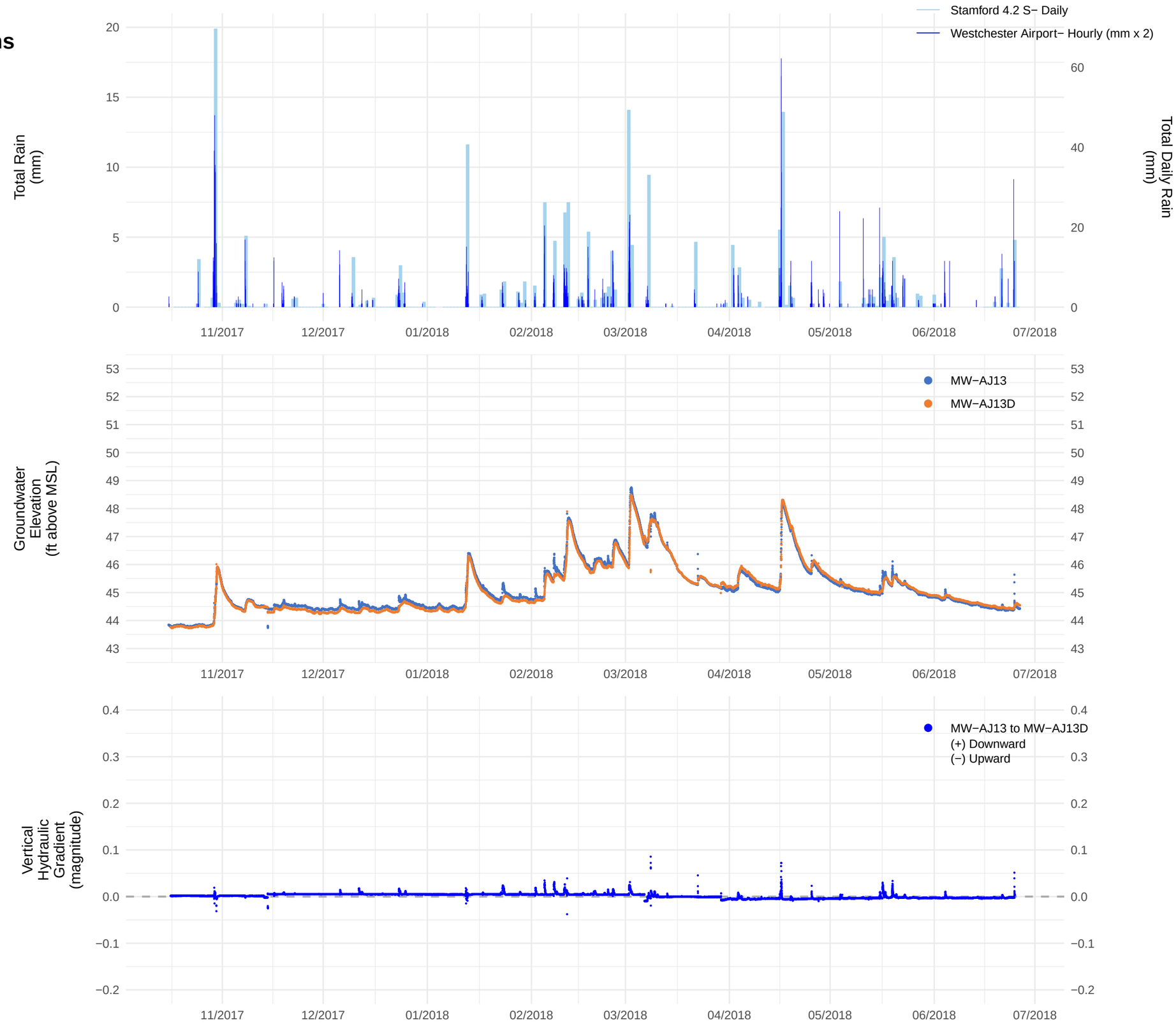
MW−AJ13
MW−AJ13D
MW−AJ13 Reference Elevation = 53.79 ft MSL
MW−AJ13D Reference Elevation = 53.65 ft MSL

11/2017 12/2017 01/2018 02/2018 03/2018 04/2018 05/2018 06/2018 07/2018

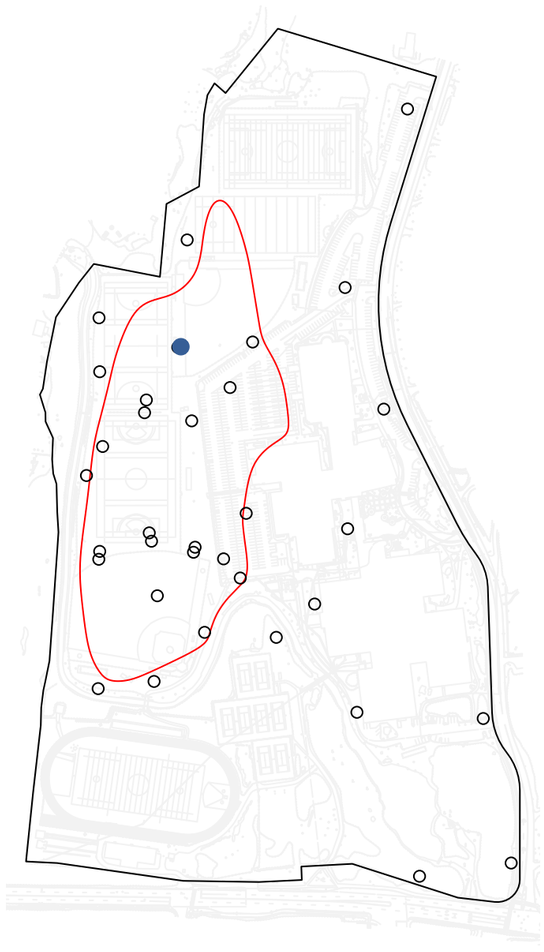
Greenwich High School Monitoring Well Couplet Elevations and Vertical Gradients



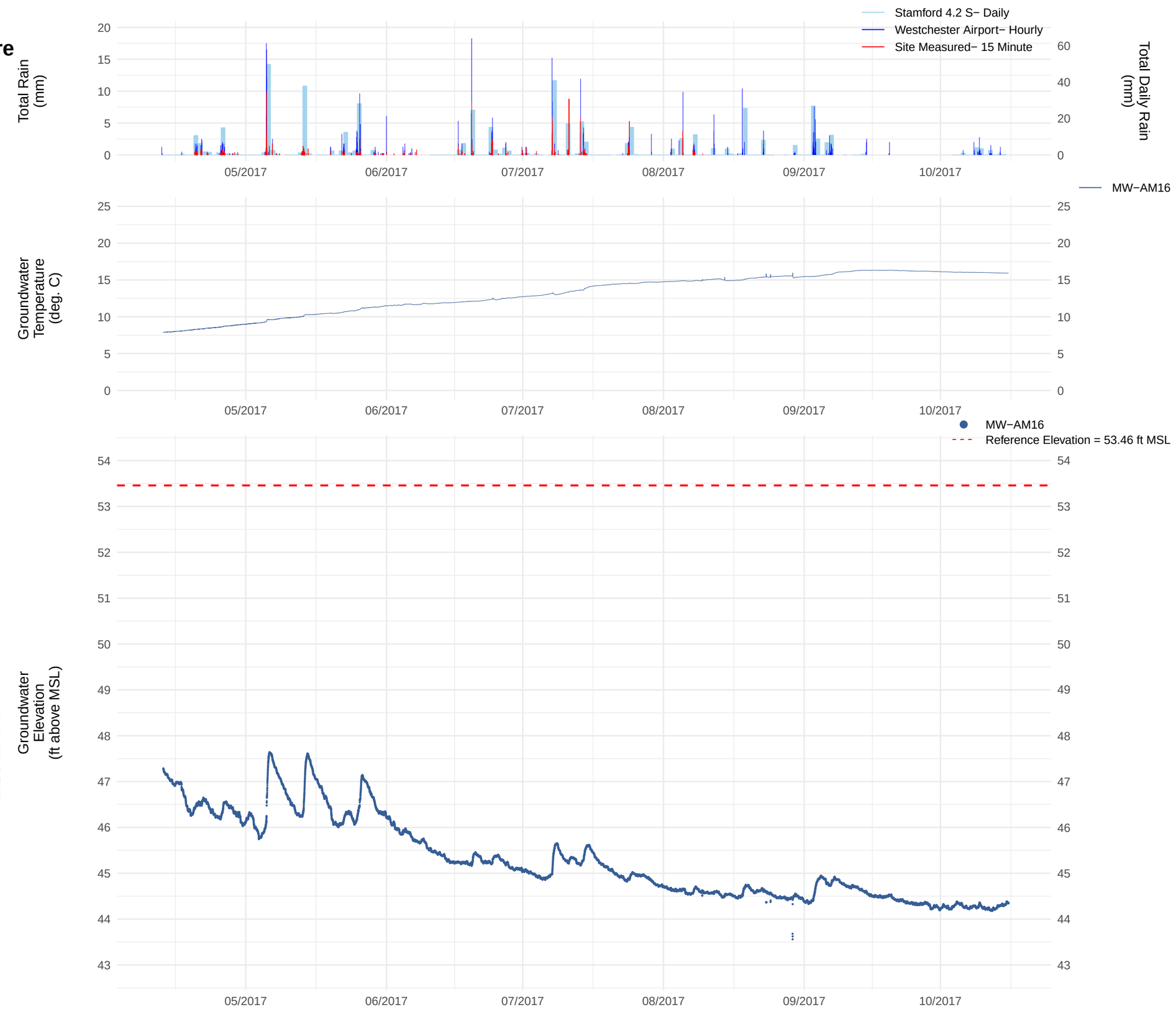
MW−AJ13
MW−AJ13D
Other Wells



Greenwich High School
Shallow Groundwater Temperature and Elevation



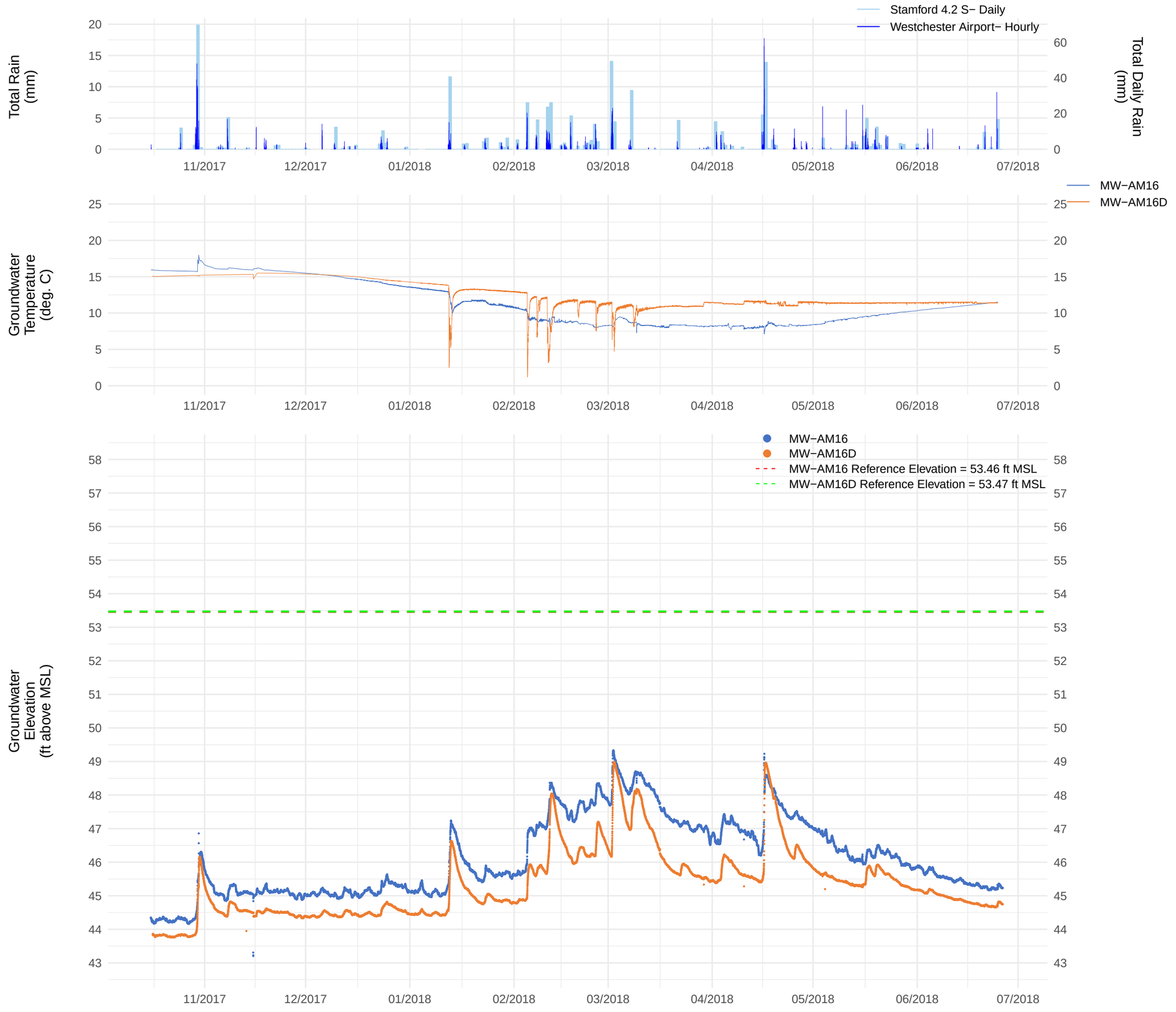
- MW−AM16
- Other Wells



Greenwich High School Shallow/Deep Groundwater Temperature and Elevation



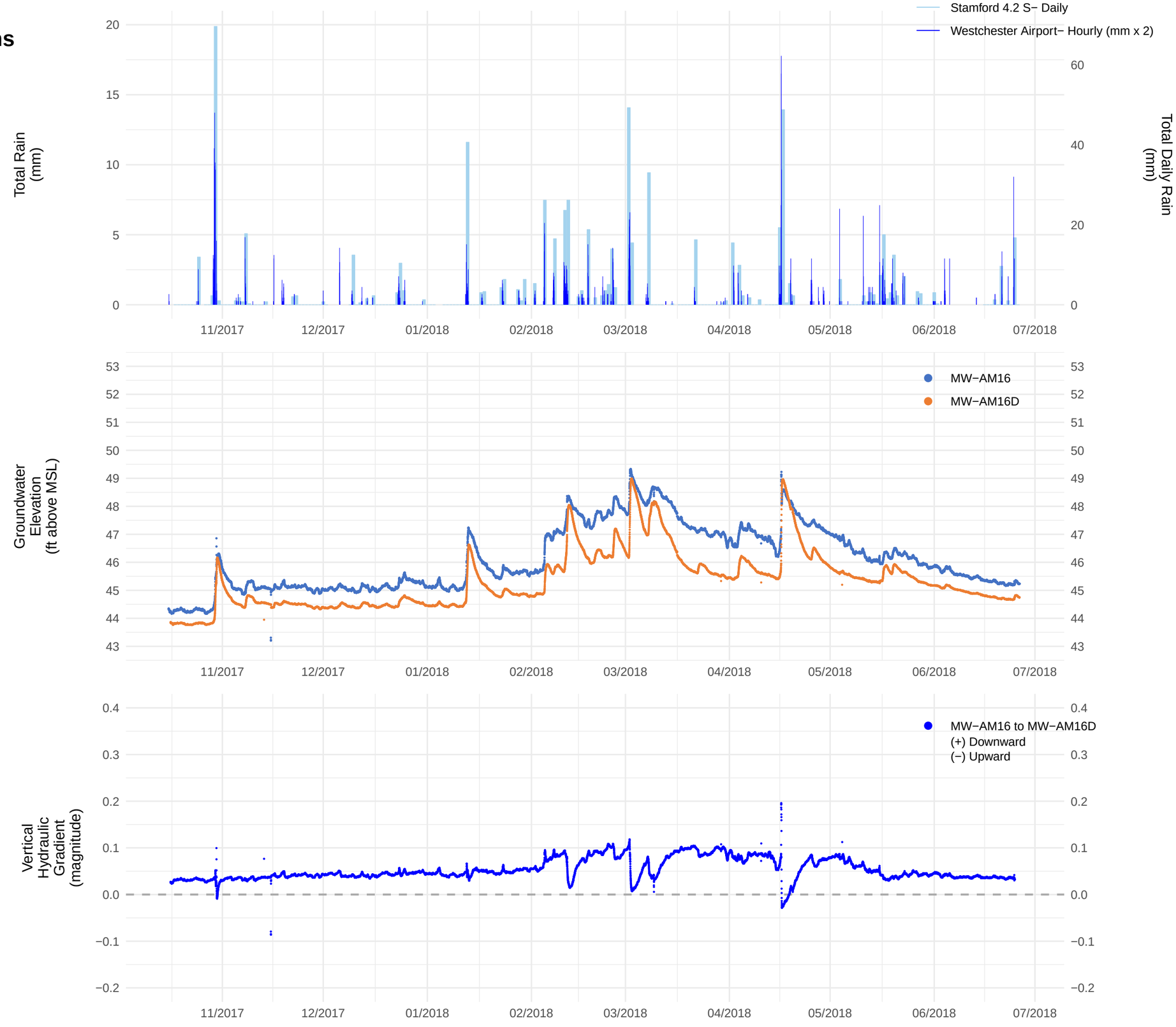
MW−AM16
MW−AM16D
Other Wells



Greenwich High School Monitoring Well Couplet Elevations and Vertical Gradients



MW−AM16
MW−AM16D
Other Wells

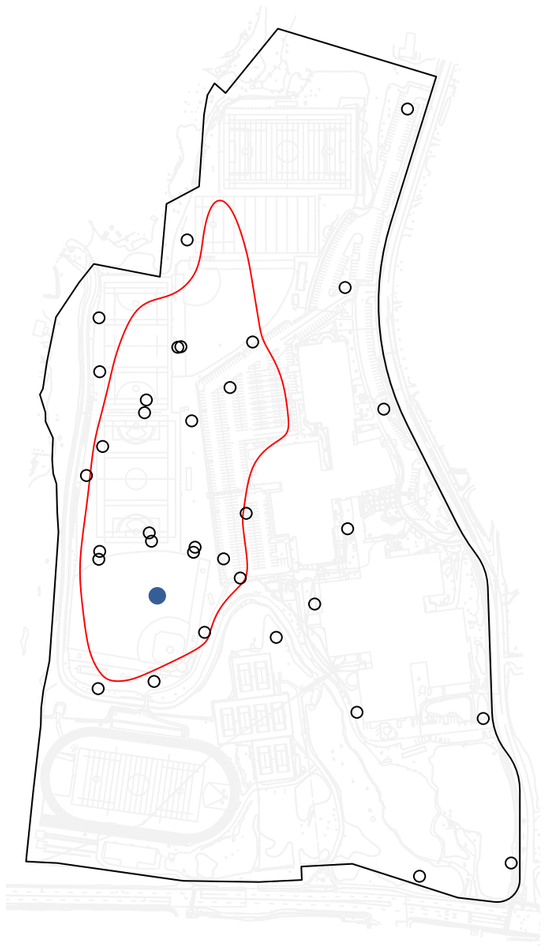


Greenwich High School Shallow Groundwater Temperature and Elevation





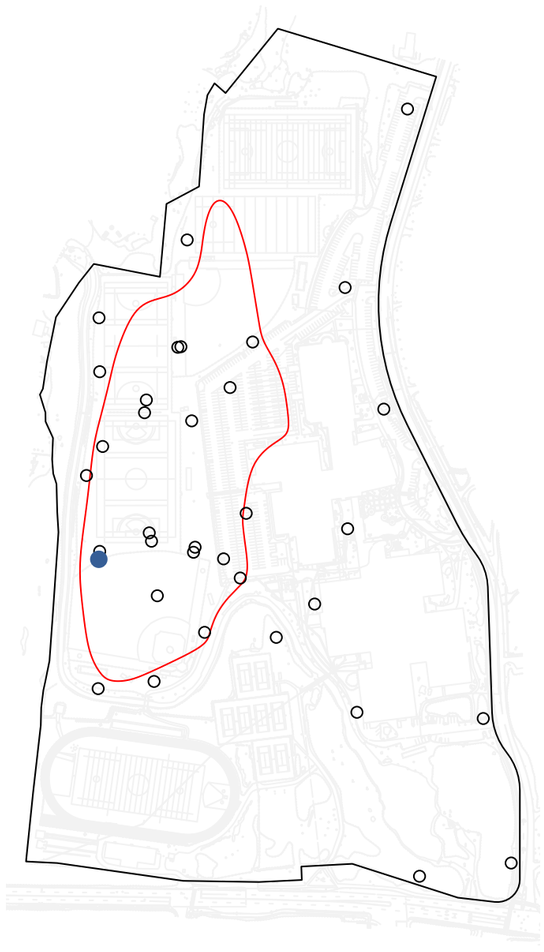
Greenwich High School
Shallow Groundwater Temperature and Elevation



- MW−V12
- Other Wells



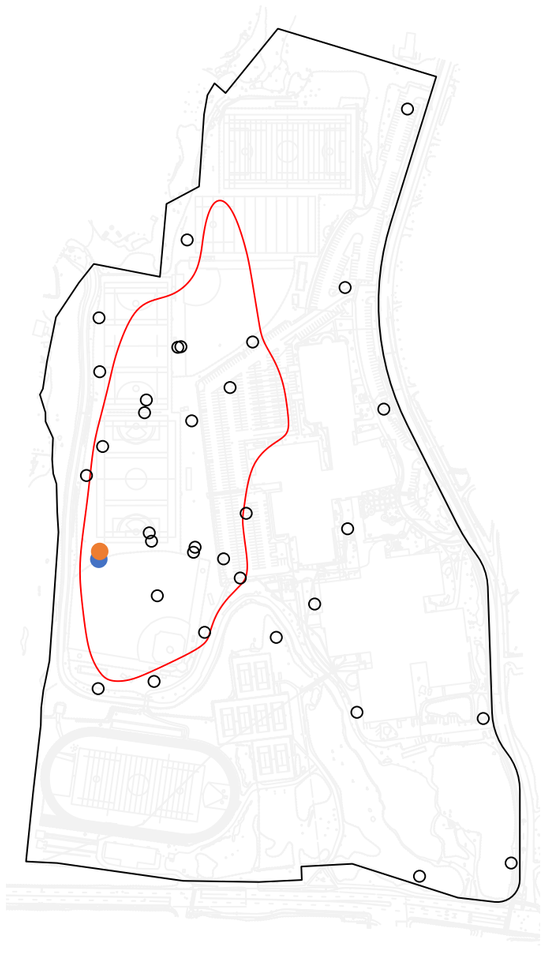
Greenwich High School
Shallow Groundwater Temperature and Elevation



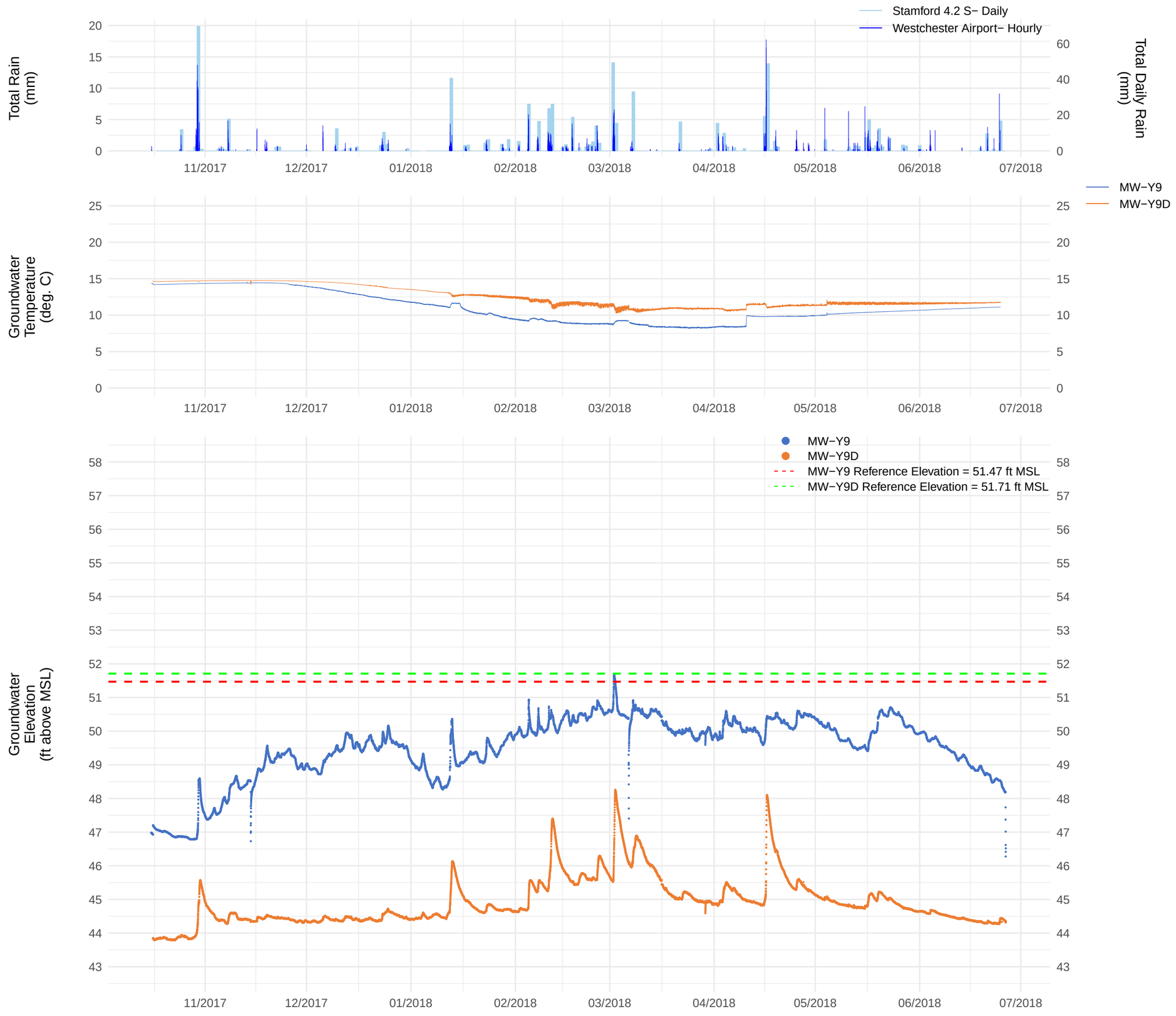
- MW−Y9
- Other Wells



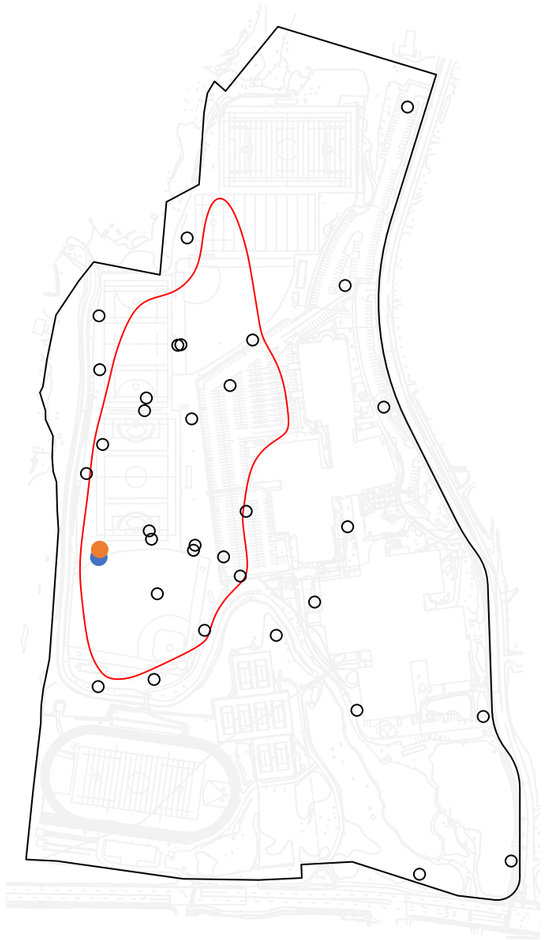
Greenwich High School Shallow/Deep Groundwater Temperature and Elevation



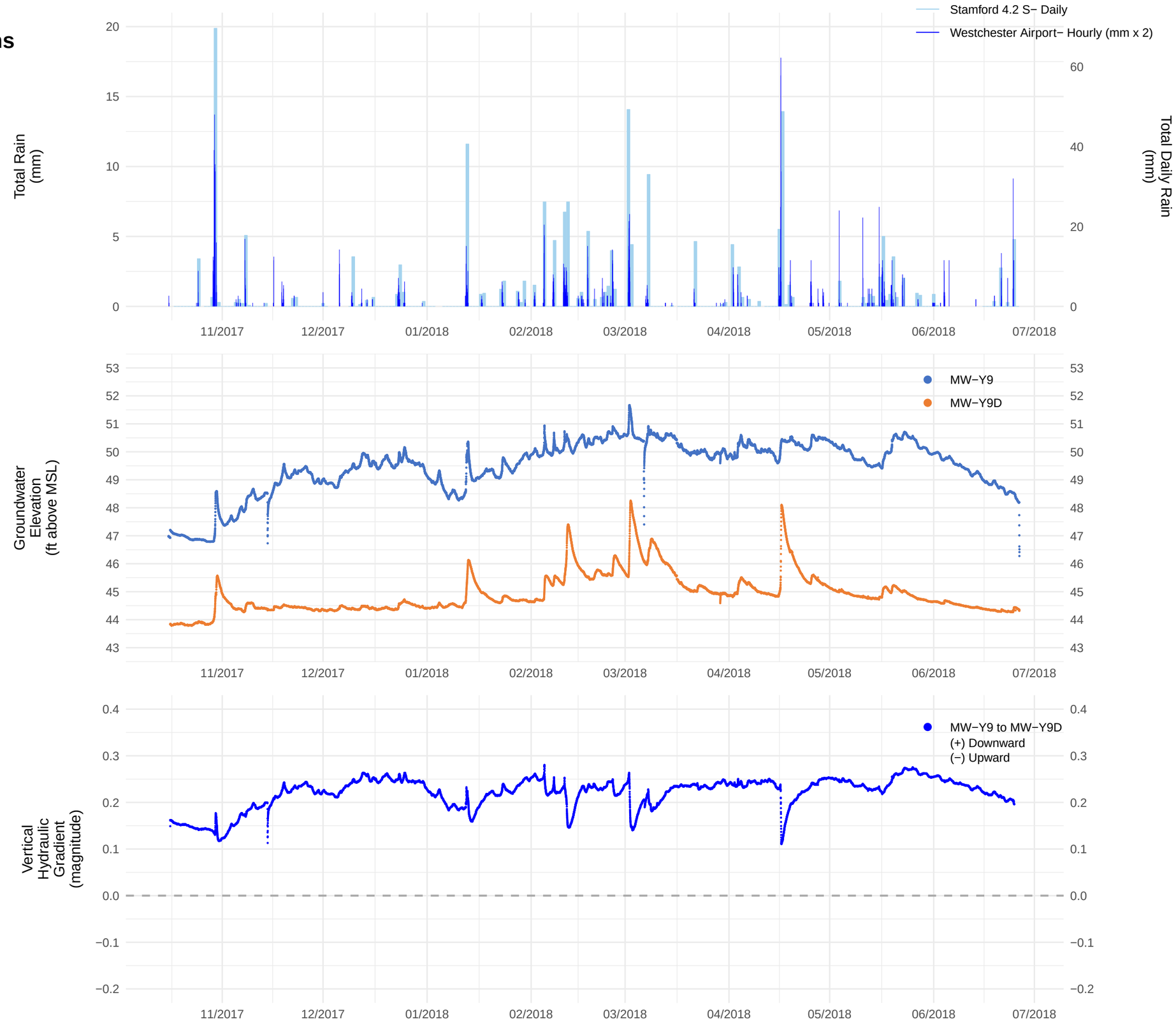
MW−Y9
MW−Y9D
Other Wells



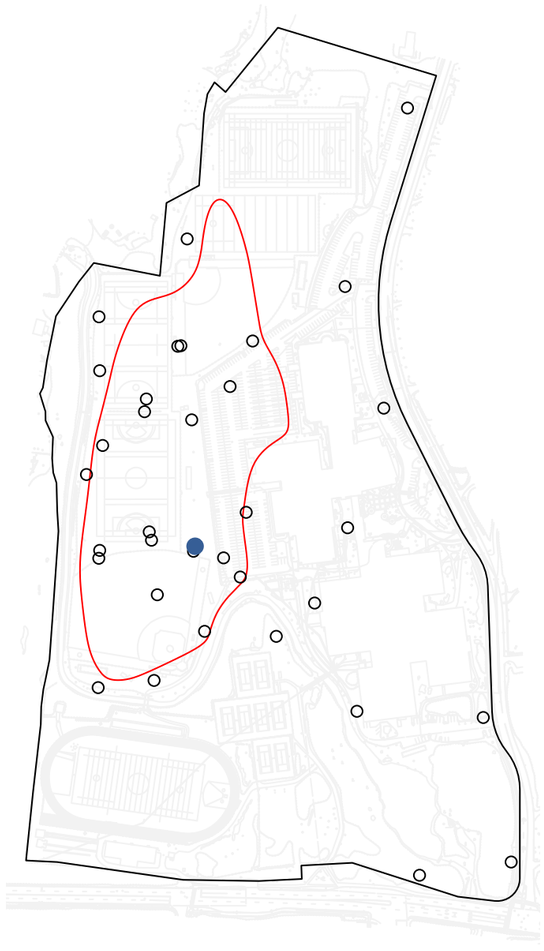
Greenwich High School Monitoring Well Couplet Elevations and Vertical Gradients



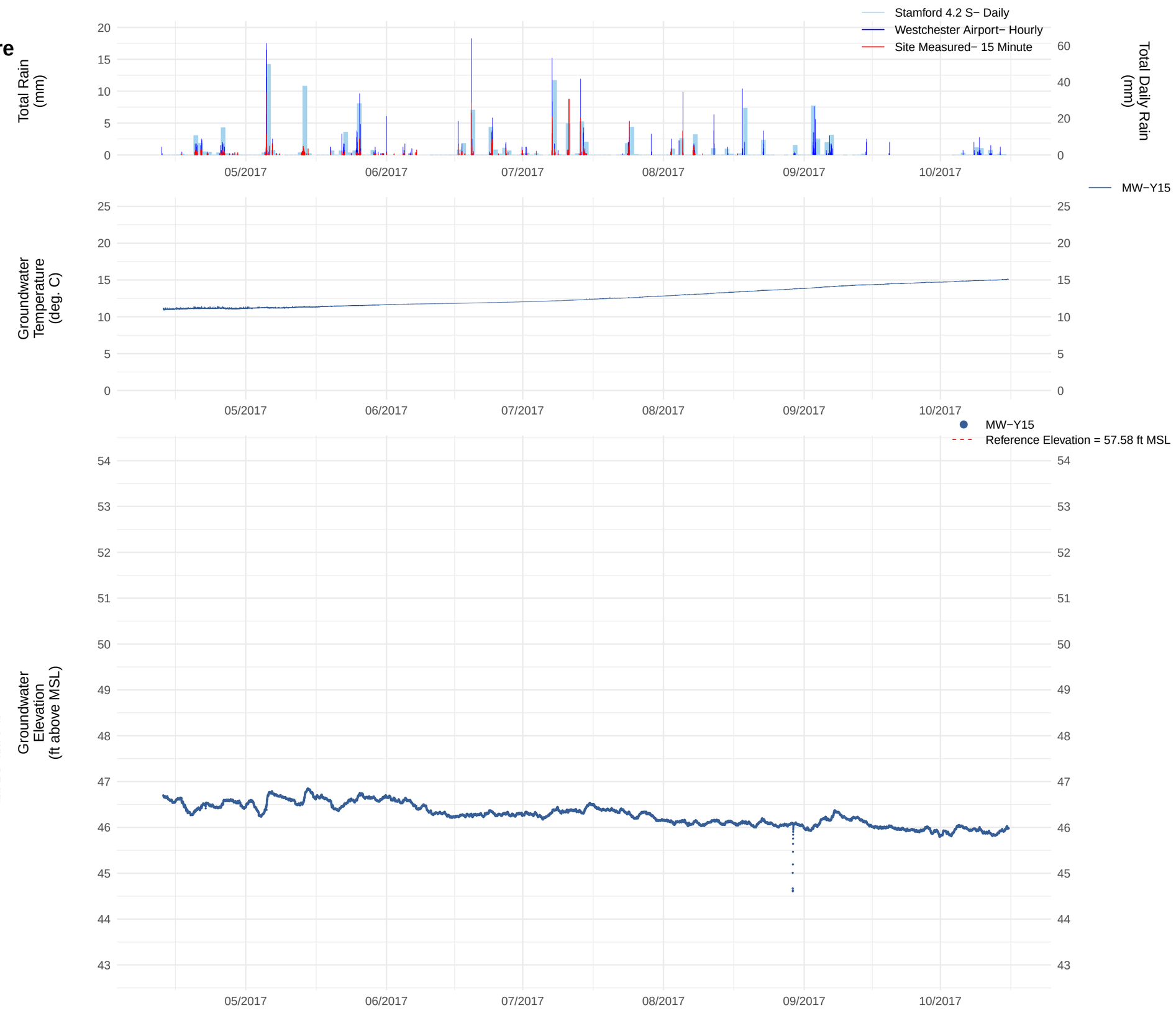
MW−Y9
MW−Y9D
Other Wells



Greenwich High School Shallow Groundwater Temperature and Elevation



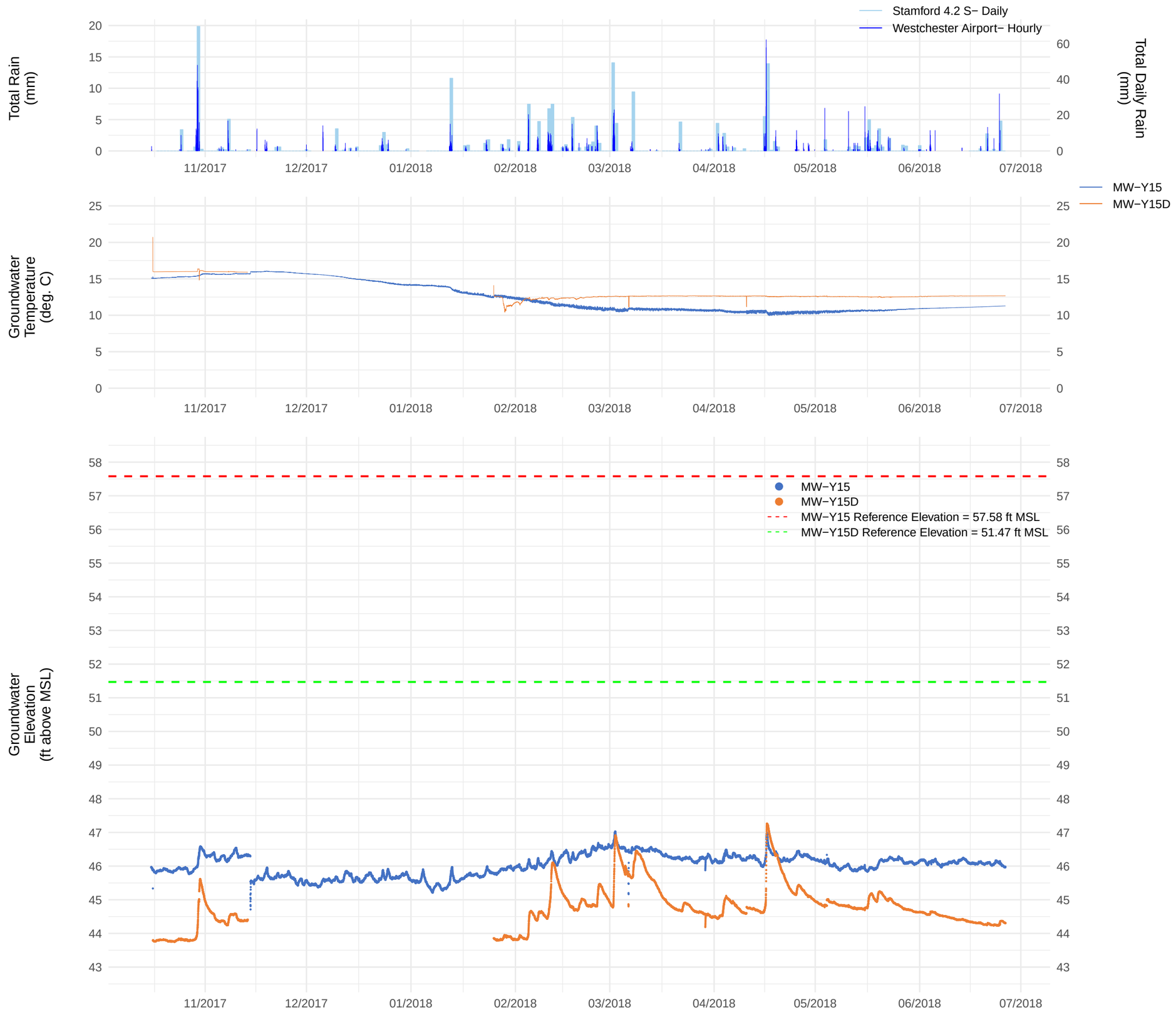
MW−Y15
Other Wells



Greenwich High School Shallow/Deep Groundwater Temperature and Elevation



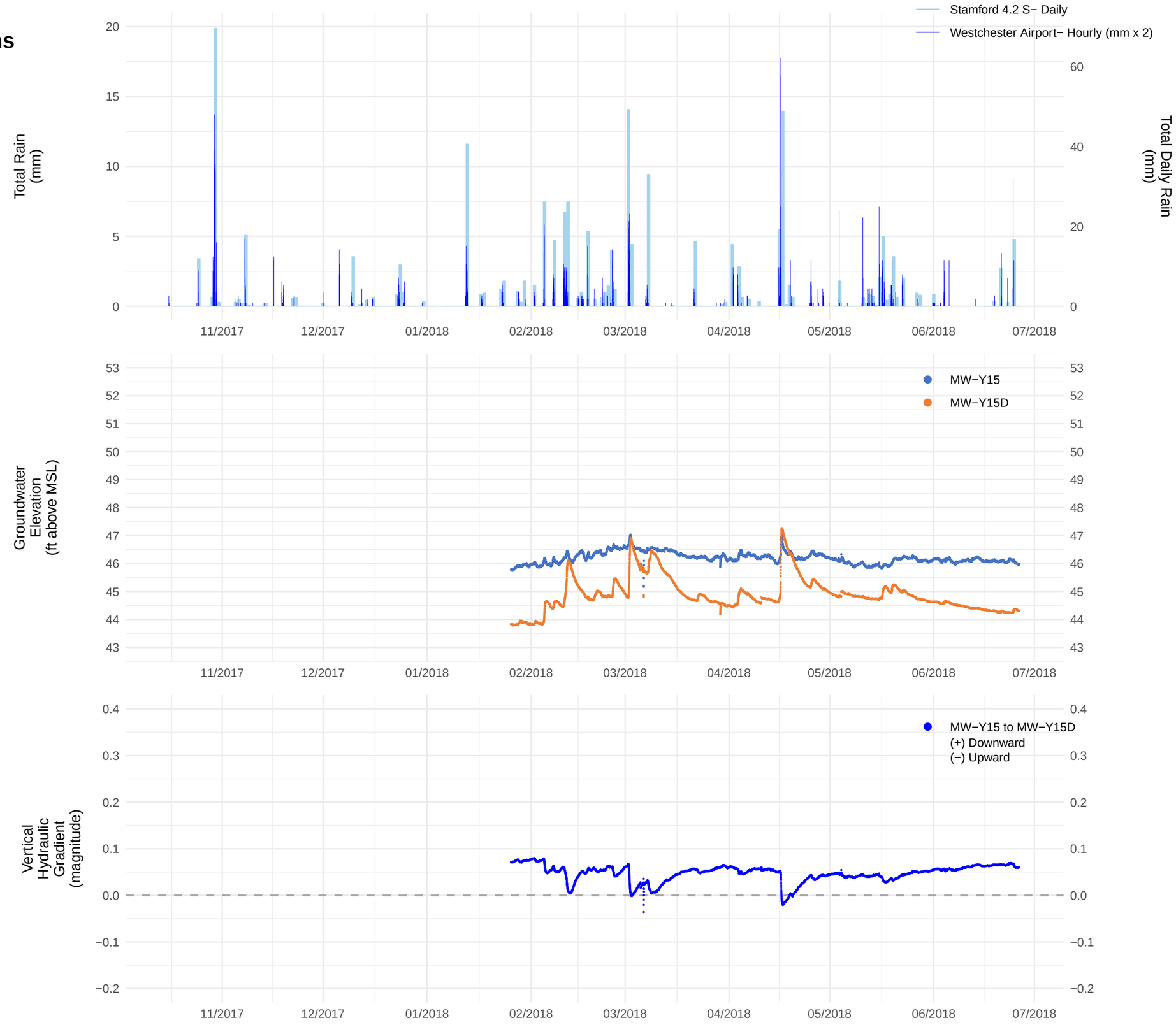
- MW−Y15
- MW−Y15D
- Other Wells



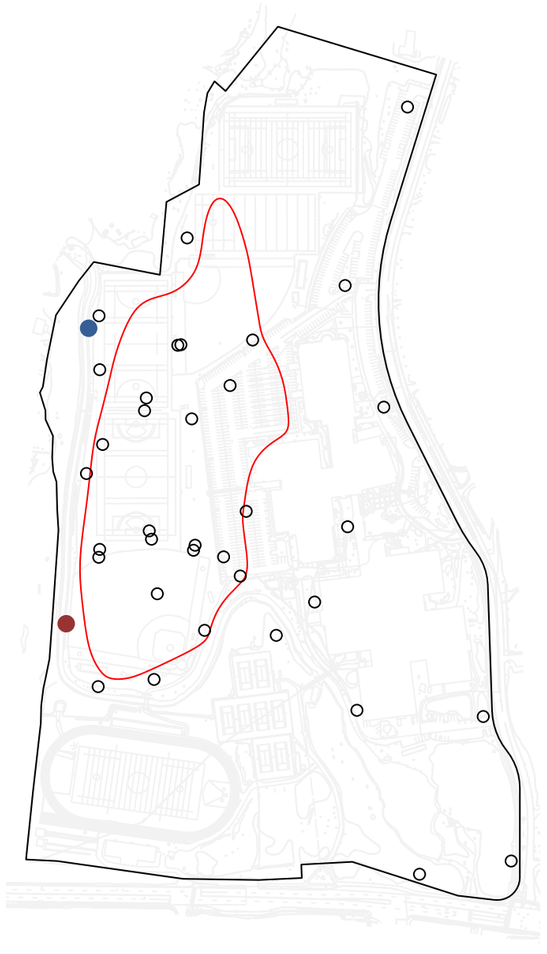
Greenwich High School Monitoring Well Couplet Elevations and Vertical Gradients



MW−Y15
MW−Y15D
Other Wells



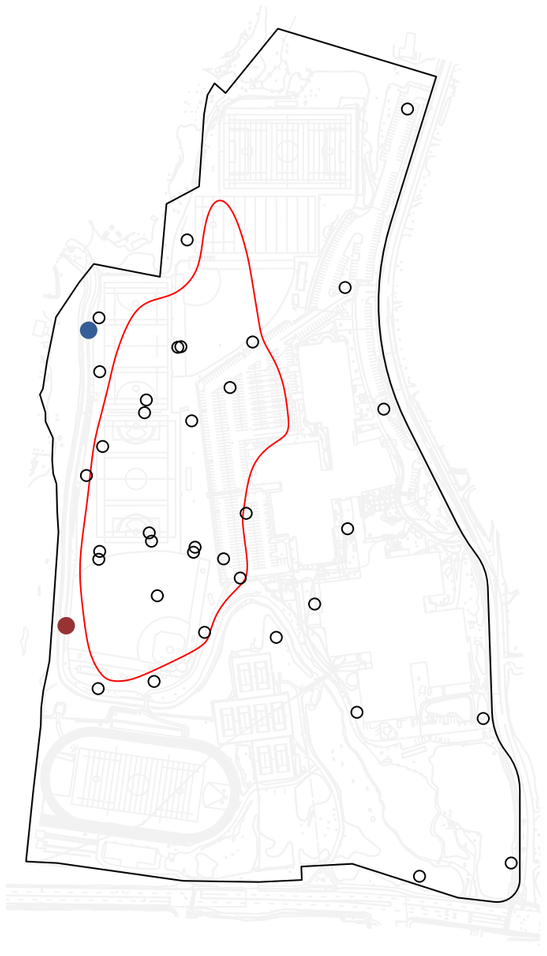
Greenwich High School Surface Water Temperature and Elevations



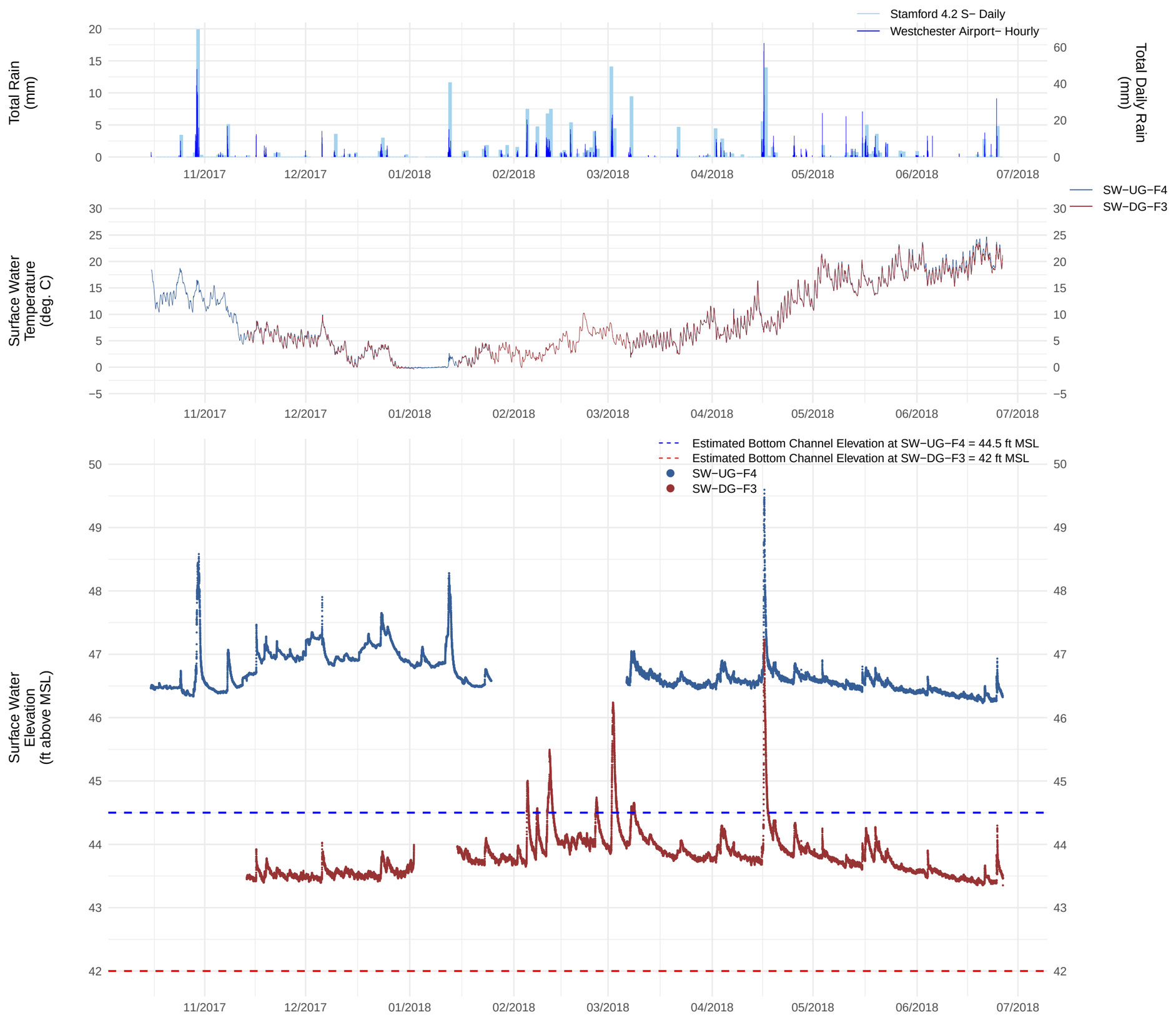
- SW−UG−F4
- SW−DG−F3
- Monitoring Wells



Greenwich High School Surface Water Temperature and Elevations



- SW−UG−F4
- SW−DG−F3
- Monitoring Wells



Appendix E

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Summary of Monthly Normals 1981-2010

Generated on 01/31/2019

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 190 ft. Lat: 41.1247° N Lon: -73.5475° W
Station: **STAMFORD 5 N, CT US USC00067970**

Temperature (°F)

Mean							Cooling Degree Days Base (above)						Heating Degree Days Base (above)				Mean Number of Days					
Month	Daily Max	Daily Min	Mean	Long Term Max Std Dev	Long Term Min Std Dev	Long Term Avg Std Dev	55	57	60	65	70	72	55	57	60	65	Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
01	38.8	20.0	29.4	4.3	5.1	4.6	-7777	-7777	0	0	0	0	794	855	948	1103	0.0	0.0	3.9	6.7	27.1	1.4
02	42.3	22.2	32.2	3.8	3.4	3.5	-7777	-7777	0	0	0	0	637	693	777	917	0.0	0.0	4.8	2.8	24.0	0.2
03	50.6	29.2	39.9	3.1	2.5	2.6	3	2	-7777	-7777	-7777	0	471	532	623	778	0.0	0.0	15.5	0.5	19.3	0.0
04	63.2	38.8	51.0	2.5	1.8	1.9	46	32	17	5	1	1	167	212	287	425	0.0	0.2	27.8	-7777	6.1	0.0
05	73.2	48.1	60.6	2.7	2.0	2.2	197	150	94	36	9	5	22	37	74	171	0.0	0.9	31.0	0.0	0.4	0.0
06	81.2	57.1	69.1	2.4	1.9	1.8	425	366	280	153	62	37	-7777	1	5	29	0.0	2.9	30.0	0.0	0.0	0.0
07	85.6	62.3	73.9	2.4	2.2	2.0	587	525	432	278	138	94	0	-7777	-7777	1	0.1	6.5	31.0	0.0	0.0	0.0
08	83.7	61.1	72.4	2.2	2.2	2.0	539	477	385	234	107	69	-7777	-7777	-7777	5	0.1	3.5	31.0	0.0	0.0	0.0
09	76.4	53.9	65.1	2.4	1.9	1.7	311	256	183	86	27	15	6	12	28	82	0.0	0.8	30.0	0.0	0.0	0.0
10	65.2	42.4	53.8	2.5	2.7	2.4	74	50	25	6	1	-7777	111	149	217	353	0.0	0.0	30.5	0.0	3.7	0.0
11	54.4	34.1	44.2	2.8	2.3	2.4	10	6	2	-7777	0	0	333	388	474	623	0.0	0.0	20.8	0.1	13.3	0.0
12	43.0	25.3	34.2	4.4	3.8	4.0	1	-7777	-7777	0	0	0	647	709	801	956	0.0	0.0	6.4	3.1	23.7	0.1
Summary	63.1	41.2	52.2	3.0	2.6	2.6	2193	1864	1418	798	345	221	3188	3588	4234	5443	0.2	14.8	262.7	13.2	117.6	1.7

-7777: a non-zero value that would round to zero

Empty or blank cells indicate data is missing or insufficient occurrences to compute value

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Summary of Monthly Normals 1981-2010

Generated on 01/31/2019

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 190 ft. Lat: 41.1247° N Lon: -73.5475° W

Station: **STAMFORD 5 N, CT US USC00067970**

Precipitation (in.)								
	Totals	Mean Number of Days				Precipitation Probabilities Probability that precipitation will be equal to or less than the indicated amount		
	Means	Daily Precipitation				Monthly Precipitation vs. Probability Levels		
Month	Mean	>= 0.01	>= 0.10	>= 0.50	>= 1.00	0.25	0.50	0.75
01	4.04	10.7	6.7	2.9	1.1	2.62	4.15	5.16
02	3.38	9.3	6.2	2.3	1.0	2.43	3.02	4.64
03	4.74	10.8	7.3	3.2	1.5	2.72	4.73	5.68
04	4.78	13.2	7.6	3.1	1.2	2.95	4.25	5.85
05	4.69	12.9	7.9	3.1	1.4	3.11	4.51	5.27
06	4.62	11.9	7.3	3.2	1.3	2.61	4.51	5.91
07	4.08	10.3	6.2	2.7	1.2	2.63	4.01	4.71
08	4.18	9.7	6.7	2.8	1.4	2.42	4.40	5.28
09	4.89	10.1	6.5	3.3	1.7	2.27	4.70	6.60
10	4.79	9.5	6.2	3.0	1.4	2.09	4.25	6.25
11	4.53	10.9	6.5	3.5	1.6	3.47	4.15	5.60
12	4.43	10.7	7.2	2.8	1.0	2.63	4.34	5.80
Summary	53.15	130.0	82.3	35.9	15.8	31.95	51.02	66.75

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration
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Summary of Monthly Normals 1981-2010

Generated on 01/31/2019

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 190 ft. Lat: 41.1247° N Lon: -73.5475° W

Station: **STAMFORD 5 N, CT US USC00067970**

Snow (in.)

	Totals	Mean Number of Days									Snow Probabilities Probability that snow will be equal to or less than the indicated amount		
	Means	Snowfall >= Thresholds					Snow Depth >= Thresholds				Monthly Snow vs. Probability Levels Values derived from the incomplete gamma distribution.		
Month	Snowfall Mean	0.01	1.0	3.0	5.00	10.00	1	3	5	10	.25	.50	.75
01	9.8	5.4	3.2	1.3	0.5	0.1					4.5	7.0	15.2
02	9.1	3.9	2.2	1.3	0.7	0.2					0.9	7.3	14.2
03	5.1	2.6	1.7	0.6	0.4	-7777					0.6	2.5	7.8
04	0.9	0.4	0.3	0.1	-7777	-7777					0.0	0.0	1.0
05	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
06	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
07	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
08	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
09	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
11	0.8	0.5	0.3	0.1	-7777	0.0					0.0	0.0	1.0
12	5.5	2.9	1.8	0.6	0.3	-7777					2.1	4.0	6.2
Summary	31.2	15.7	9.5	4.0	1.9	0.3	0.0	0.0	0.0	0.0	8.1	20.8	45.4

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration
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Summary of Monthly Normals 1981-2010

Generated on 01/31/2019

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 190 ft. Lat: 41.1247° N Lon: -73.5475° W

Station: **STAMFORD 5 N, CT US USC00067970**

Growing Degree Units (Monthly)												
Base	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
40	18	20	98	336	640	874	1052	1004	754	429	170	39
45	5	6	41	207	485	724	897	849	604	283	86	14
50	1	1	13	108	334	574	742	694	455	160	35	4
55	-7777	-7777	3	46	197	425	587	539	311	74	10	1
60	0	0	-7777	17	94	280	432	385	183	25	2	-7777
Growing Degree Units for Corn (Monthly)												
50/86	9	14	64	205	389	569	712	677	479	252	94	19

Growing Degree Units (Accumulated Monthly)												
Base	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
40	18	38	136	472	1112	1986	3038	4042	4796	5225	5395	5434
45	5	11	52	259	744	1468	2365	3214	3818	4101	4187	4201
50	1	2	15	123	457	1031	1773	2467	2922	3082	3117	3121
55	0	0	3	49	246	671	1258	1797	2108	2182	2192	2193
60	0	0	0	17	111	391	823	1208	1391	1416	1418	1418
Growing Degree Units for Corn (Monthly Accumulated)												
50/86	9	23	87	292	681	1250	1962	2639	3118	3370	3464	3483

Note: For corn, temperatures below 50 are set to 50, and temperatures above 86 are set to 86.

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National Oceanic & Atmospheric Administration
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Summary of Monthly Normals 1981-2010

Generated on 01/31/2019

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 379 ft. Lat: 41.0669° N Lon: -73.7075° W

Station: **WESTCHESTER CO AIRPORT, NY US USW00094745**

Temperature (°F)

	Mean						Cooling Degree Days Base (above)						Heating Degree Days Base (above)				Mean Number of Days					
Month	Daily Max	Daily Min	Mean	Long Term Max Std Dev	Long Term Min Std Dev	Long Term Avg Std Dev	55	57	60	65	70	72	55	57	60	65	Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
01	35.4	21.1	28.3	5.0	5.1	5.0	-7777	-7777	0	0	0	0	829	891	984	1139	0.0	0.0	2.8	11.5	26.8	0.9
02	38.8	22.9	30.9	4.0	3.6	3.7	-7777	-7777	-7777	0	0	0	676	732	816	956	0.0	0.0	3.6	6.8	24.0	-7777
03	46.8	29.3	38.0	3.3	2.9	2.9	3	1	-7777	-7777	-7777	-7777	528	589	681	835	0.0	0.0	10.4	1.5	19.2	0.0
04	58.0	39.3	48.6	2.7	1.9	2.2	31	21	11	3	1	-7777	221	271	351	494	0.0	-7777	23.7	-7777	4.2	0.0
05	68.0	48.6	58.3	3.0	2.1	2.5	145	108	66	24	6	3	42	67	119	232	0.0	0.1	30.7	0.0	0.1	0.0
06	77.0	58.9	68.0	2.2	1.7	1.8	390	332	249	132	50	30	1	3	11	43	0.0	0.7	30.0	0.0	0.0	0.0
07	81.6	63.9	72.8	2.7	2.0	2.3	550	488	395	243	112	73	0	0	-7777	3	-7777	2.7	31.0	0.0	0.0	0.0
08	79.9	62.9	71.4	2.3	2.0	2.1	508	446	354	206	88	55	-7777	-7777	1	8	0.0	1.4	31.0	0.0	0.0	0.0
09	72.5	55.1	63.8	2.5	2.2	2.1	275	222	153	67	20	11	11	18	39	103	0.0	0.3	30.0	0.0	-7777	0.0
10	61.5	43.7	52.6	2.8	2.8	2.7	63	42	21	5	1	-7777	138	179	250	389	0.0	0.0	28.5	0.0	1.5	0.0
11	51.4	36.0	43.7	2.9	2.5	2.6	9	5	2	-7777	0	0	348	404	491	639	0.0	0.0	16.7	0.2	10.1	0.0
12	40.4	26.8	33.6	4.4	4.1	4.2	1	-7777	-7777	0	0	0	664	726	818	973	0.0	0.0	4.8	5.7	22.5	-7777
Summary	59.3	42.4	50.8	3.1	2.7	2.8	1975	1665	1251	680	278	172	3458	3880	4561	5814	0.0	5.2	243.2	25.7	108.4	0.9

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Summary of Monthly Normals 1981-2010

Generated on 01/31/2019

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 379 ft. Lat: 41.0669° N Lon: -73.7075° W
Station: **WESTCHESTER CO AIRPORT, NY US USW00094745**

Precipitation (in.)								
	Totals	Mean Number of Days				Precipitation Probabilities Probability that precipitation will be equal to or less than the indicated amount		
	Means	Daily Precipitation				Monthly Precipitation vs. Probability Levels		
Month	Mean	>= 0.01	>= 0.10	>= 0.50	>= 1.00	0.25	0.50	0.75
01	3.78	9.3	6.4	2.3	0.7	2.35	3.75	4.83
02	2.99	8.5	6.0	2.0	0.7	1.92	2.77	3.86
03	4.52	10.3	7.2	3.2	1.2	3.17	4.23	5.54
04	4.40	10.3	7.0	2.5	1.1	2.78	3.66	5.79
05	4.12	10.9	6.9	2.6	1.1	2.55	4.14	4.89
06	4.25	9.9	6.6	2.6	1.2	2.44	4.41	5.53
07	3.71	9.0	6.1	2.6	1.0	2.04	3.44	4.79
08	4.16	9.5	5.9	2.2	1.2	2.54	4.41	5.09
09	4.72	8.7	5.6	2.9	1.5	2.19	4.11	6.01
10	4.41	9.0	5.3	2.6	1.3	1.91	3.43	5.92
11	3.97	9.9	6.2	2.8	1.2	2.42	3.73	5.35
12	4.32	10.4	7.0	2.9	1.3	2.62	4.17	5.50
Summary	49.35	115.7	76.2	31.2	13.5	28.93	46.25	63.10

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Summary of Monthly Normals 1981-2010

Generated on 01/31/2019

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 379 ft. Lat: 41.0669° N Lon: -73.7075° W

Station: **WESTCHESTER CO AIRPORT, NY US USW00094745**

Snow (in.)

	Totals	Mean Number of Days									Snow Probabilities Probability that snow will be equal to or less than the indicated amount		
	Means	Snowfall >= Thresholds					Snow Depth >= Thresholds				Monthly Snow vs. Probability Levels Values derived from the incomplete gamma distribution.		
Month	Snowfall Mean	0.01	1.0	3.0	5.00	10.00	1	3	5	10	.25	.50	.75
01	7.7	3.6	3.0	1.1	0.5	0.1					2.8	6.3	11.3
02	8.3	2.4	2.0	1.0	0.7	0.1					1.5	6.5	13.5
03	4.9	1.8	1.5	0.6	0.4	-7777					0.0	1.0	7.8
04	1.2	0.3	0.3	0.1	0.1	-7777					0.0	0.0	0.5
05	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
06	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
07	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
08	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
09	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0
11	0.4	0.3	0.2	0.1	0.0	0.0					0.0	0.0	0.0
12	5.2	2.3	2.1	0.7	0.3	0.1					1.9	5.5	6.2
Summary	27.7	10.7	9.1	3.6	2.0	0.3	0.0	0.0	0.0	0.0	6.2	19.3	39.3

-7777: a non-zero value that would round to zero

Empty or blank cells indicate data is missing or insufficient occurrences to compute value

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Summary of Monthly Normals 1981-2010

Generated on 01/31/2019

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 379 ft. Lat: 41.0669° N Lon: -73.7075° W

Station: **WESTCHESTER CO AIRPORT, NY US USW00094745**

Growing Degree Units (Monthly)												
Base	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
40	16	18	75	271	567	838	1015	973	714	392	161	39
45	4	6	30	155	413	688	860	818	564	252	80	15
50	1	1	10	75	267	538	705	663	416	140	32	4
55	-7777	-7777	3	31	145	390	550	508	275	63	9	1
60	0	-7777	-7777	11	66	249	395	354	153	21	2	-7777
Growing Degree Units for Corn (Monthly)												
50/86	7	9	41	138	309	536	692	656	429	197	68	14

Growing Degree Units (Accumulated Monthly)												
Base	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
40	16	34	109	380	947	1785	2800	3773	4487	4879	5040	5079
45	4	10	40	195	608	1296	2156	2974	3538	3790	3870	3885
50	1	2	12	87	354	892	1597	2260	2676	2816	2848	2852
55	0	0	3	34	179	569	1119	1627	1902	1965	1974	1975
60	0	0	0	11	77	326	721	1075	1228	1249	1251	1251
Growing Degree Units for Corn (Monthly Accumulated)												
50/86	7	16	57	195	504	1040	1732	2388	2817	3014	3082	3096

Note: For corn, temperatures below 50 are set to 50, and temperatures above 86 are set to 86.

-7777: a non-zero value that would round to zero.

Empty or blank cells indicate data is missing or insufficient occurrences to compute value.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Summary of Monthly Normals 1981-2010

Generated on 01/31/2019

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 300 ft. Lat: 41.0825° N Lon: -73.6386° W

Station: **PUTNAM LAKE, CT US USC00066655**

Precipitation (in.)								
	Totals	Mean Number of Days				Precipitation Probabilities Probability that precipitation will be equal to or less than the indicated amount		
	Means	Daily Precipitation				Monthly Precipitation vs. Probability Levels		
Month	Mean	>= 0.01	>= 0.10	>= 0.50	>= 1.00	0.25	0.50	0.75
01	3.67	10.2	5.8	2.5	1.0	2.48	3.30	5.08
02	3.04	9.2	6.0	2.0	0.9	1.87	2.76	4.15
03	4.29	11.1	7.1	3.0	1.4	2.46	4.28	5.30
04	4.47	12.4	7.7	2.9	1.1	2.48	4.24	5.89
05	4.34	12.0	7.2	2.8	1.5	2.62	4.12	5.19
06	4.39	10.7	6.8	2.8	1.1	2.73	3.59	5.91
07	4.12	9.9	6.3	2.8	1.2	2.53	3.37	4.96
08	4.33	9.6	6.6	2.7	1.3	2.65	4.54	5.64
09	4.69	9.7	6.4	3.1	1.6	2.26	4.63	6.06
10	4.51	9.2	5.7	2.8	1.5	1.98	3.83	6.06
11	4.09	10.8	6.2	3.2	1.6	2.98	3.94	5.52
12	4.10	10.1	6.4	2.7	1.0	2.41	4.13	5.16
Summary	50.04	124.9	78.2	33.3	15.2	29.45	46.73	64.92

-7777: a non-zero value that would round to zero

Empty or blank cells indicate data is missing or insufficient occurrences to compute value

Appendix F

AECOM

IT ID No. IT- Y9 Loc 1

Sheet 1 of 1

Prepared for:	Town of Greenwich			PROJECT:	Greenwich High School
				LOCATION / BOROUGH :	Greenwich, CT
INSPECTOR:	J. Christopher	TESTER:	D. Hare	Start Date:	8/23/2017
CONTRACTOR:	N/A	HELPER:	J. Christopher	Start Time:	
P.E./REP.:	J. Christopher				
Depth of IT:	0 ft	Drill Bit Type:	N/A	Weight for casing:	50 lbs
Rig Type:	Turf Tek	Casing Internal Diameter:	6 in	Type of Hammer:	Constant pressure
		Casing Length:	4 in		

Weather:

ASTM D-6391 – 11
PERMEABILITY COEFFICIENT (Km) FORMULA:

General Formula:

$$K_m = \pi R_t \times \frac{\left[D\left\{Ln\left(\frac{h_1}{h_2}\right)\right\}\right]}{11 \times (t_2 - t_1)}$$

Formula for 4" internal diameter casing (in/hr):

$$K_m = 1.142 R_t \times \frac{\left[Ln\left(\frac{h_1}{h_2}\right)\right]}{(t_2 - t_1)}$$

where:

$$R_t = {2.2902(0.9842^T)}/{T^{0.1702}}$$

IT-Y9 Loc 1 @ 0 ft

TEST 1

Water temperature (°C), T: 23.9 Rt= 0.91

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.09	3.75	0.250	2.773	0.001	3467.0293
0.17	3.5	0.500	2.079	0.001	-866.7573
0.33	3.25	0.750	1.674	0.003	-242.7226
0.46	3	1.000	1.386	0.002	-202.3519
0.53	2.75	1.250	1.163	0.001	-279.0335
0.67	2.5	1.500	0.981	0.002	-129.8660
0.77	2.25	1.750	0.827	0.002	-133.4494
0.87	2	2.000	0.693	0.002	-134.1776
1.01	1.75	2.250	0.575	0.002	-77.0671
1.13	1.5	2.500	0.470	0.002	-80.1181
1.28	1.25	2.750	0.375	0.003	-59.5911
1.42	1	3.000	0.288	0.002	-61.2027
1.55	0.75	3.250	0.208	0.002	-56.3010
1.70	0.5	3.500	0.134	0.003	-46.3348
1.85	0.25	3.750	0.065	0.003	-43.1366

TEST 2

Water temperature (°C), T: 23.9 Rt= 0.91

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.16	3.75	0.250	2.773	0.003	1500.1569
0.33	3.5	0.500	2.079	0.003	-375.0392
0.51	3.25	0.750	1.674	0.003	-215.2446
0.68	3	1.000	1.386	0.003	-155.6553
0.81	2.75	1.250	1.163	0.002	-160.9809
0.98	2.5	1.500	0.981	0.003	-97.7087
1.13	2.25	1.750	0.827	0.003	-96.3801
1.32	2	2.000	0.693	0.003	-68.3086
1.47	1.75	2.250	0.575	0.003	-73.6419
1.63	1.5	2.500	0.470	0.003	-59.2874
1.83	1.25	2.750	0.375	0.003	-44.6933
2.02	1	3.000	0.288	0.003	-44.5111
2.18	0.75	3.250	0.208	0.003	-45.0408
2.40	0.5	3.500	0.134	0.004	-32.0779
2.58	0.25	3.750	0.065	0.003	-35.2936

TEST 1 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 102.6888 in/hr

TEST 2 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 67.3199 in/hr

AVERAGE IT-Y9 Loc 1 @ 0 ft

Time Weighted Average Permeability Coefficient **Km=** 85.0043 in/hr

Inspectors Remarks:

DEFINITION OF VARIABLES

*Km= Mean permeability

T = Temperature of permeant (water), in °C

Ln = Natural Logarithmic

t1 = Time at the start of the test in the same units selected for Km

t2= Time at the end of the test in the units selected for Km

h1= Height of the water above the bottom of the casing at the start of the test in the same units selected for Km

h2= Height of the water above the bottom of the casing at the end of the test in the same units selected for Km

AECOM

IT ID No. IT- Y9 Loc 2

Sheet 1 of 1

Prepared for: Town of Greenwich		PROJECT: Greenwich High School	
		LOCATION / BOROUGH : Greenwich, CT	
INSPECTOR: J. Christopher	TESTER: D. Hare	Start Date: 8/23/2017	Weather:
CONTRACTOR:	HELPER: J. Christopher	Start Time:	
P.E./REP.: J. Christopher			
Depth of IT: 0 ft	Drill Bit Type: N/A	Weight for casing: 50 lbs	
Rig Type: Turf Tek	Casing Internal Diameter: 6 in	Type of Hammer: Constant pressure	
	Casing Length: 4 in		

ASTM D-6391 – 11
PERMEABILITY COEFFICIENT (Km) FORMULA:

General Formula:

$$K_m = \pi R_t \times \frac{\left[D\left\{Ln\left(\frac{h_1}{h_2}\right)\right\}\right]}{11 \times (t_2 - t_1)}$$

Formula for 4" internal diameter casing (in/hr):

$$K_m = 1.142 R_t \times \frac{\left[Ln\left(\frac{h_1}{h_2}\right)\right]}{(t_2 - t_1)}$$

where:

$$R_t = {2.2902(0.9842^T)}/{T^{0.1702}}$$

IT-Y9 Loc 2 @ 0 ft

TEST 1

Water temperature (°C), T: 23.9 Rt= 0.91

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.06	3.75	0.250	2.773	0.002	2108.3286
0.19	3.5	0.500	2.079	0.002	-527.0822
0.38	3.25	0.750	1.674	0.003	-196.6890
0.60	3	1.000	1.386	0.004	-122.6375
0.77	2.75	1.250	1.163	0.003	-120.7357
0.95	2.5	1.500	0.981	0.003	-97.7087
1.14	2.25	1.750	0.827	0.003	-77.4483
1.34	2	2.000	0.693	0.003	-61.0890
1.54	1.75	2.250	0.575	0.003	-55.2314
1.73	1.5	2.500	0.470	0.003	-52.9352
1.95	1.25	2.750	0.375	0.004	-40.6303
2.22	1	3.000	0.288	0.005	-29.4953
2.41	0.75	3.250	0.208	0.003	-39.5095
2.64	0.5	3.500	0.134	0.004	-30.2183
2.87	0.25	3.750	0.065	0.004	-28.5463

TEST 2

Water temperature (°C), T: 23.9 Rt= 0.91

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.09	3.75	0.250	2.773	0.004	1054.1643
0.34	3.5	0.500	2.079	0.004	-263.5411
0.60	3.25	0.750	1.674	0.004	-144.4046
0.88	3	1.000	1.386	0.005	-94.6676
1.14	2.75	1.250	1.163	0.004	-83.1557
1.39	2.5	1.500	0.981	0.004	-66.6196
1.59	2.25	1.750	0.827	0.003	-74.7777
1.89	2	2.000	0.693	0.005	-41.0598
2.21	1.75	2.250	0.575	0.005	-34.3408
2.52	1.5	2.500	0.470	0.005	-32.5755
2.81	1.25	2.750	0.375	0.005	-30.1303
3.13	1	3.000	0.288	0.005	-25.7696
3.44	0.75	3.250	0.208	0.005	-24.2155
3.73	0.5	3.500	0.134	0.005	-24.2449
4.06	0.25	3.750	0.065	0.005	-19.6076

TEST 1 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 64.8787 in/hr

TEST 2 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 44.4723 in/hr

AVERAGE IT-Y9 Loc 2 @ 0 ft

Time Weighted Average Permeability Coefficient **Km=** 54.6755 in/hr

Inspectors Remarks:

DEFINITION OF VARIABLES

*Km= Mean permeability
T = Temperature of permeant (water), in °C
Ln = Natural Logarithmic
t1 = Time at the start of the test in the same units selected for Km
t2= Time at the end of the test in the units selected for Km
h1= Height of the water above the bottom of the casing at the start of the test in the same units selected for Km
h2= Height of the water above the bottom of the casing at the end of the test in the same units selected for Km

AECOM

IT ID No. IT- Y9 Loc 3 Bald

Sheet 1 of 1

Prepared for:	Town of Greenwich		PROJECT:	Greenwich High School	
			LOCATION / BOROUGH :	Greenwich, CT	
INSPECTOR:	J. Christopher	TESTER: D. Hare	Start Date:	8/23/2017	Weather:
CONTRACTOR:		HELPER: J. Christopher	Start Time:		
P.E./REP.:	J. Christopher				
Depth of IT:	0 ft	Drill Bit Type:	N/A	Weight for casing:	50 lbs
Rig Type:	Turf Tek	Casing Internal Diameter:	6 in	Type of Hammer:	Constant pressure
		Casing Length:	4 in		

ASTM D-6391 – 11
PERMEABILITY COEFFICIENT (Km) FORMULA:

General Formula:

$$K_m = \pi R_t \times \frac{\left[D\left\{Ln\left(\frac{h_1}{h_2}\right)\right\}\right]}{11 \times (t_2 - t_1)}$$

Formula for 4" internal diameter casing (in/hr):

$$K_m = 1.142 R_t \times \frac{\left[Ln\left(\frac{h_1}{h_2}\right)\right]}{(t_2 - t_1)}$$

where:

$$R_t = {2.2902(0.9842^T)}/{T^{0.1702}}$$

IT-Y9 Loc 3 Bald @ 0 ft

TEST 1

Water temperature (°C), T: 23.9 Rt= 0.91

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.09	3.75	0.250	2.773	0.003	1725.8442
0.24	3.5	0.500	2.079	0.003	-431.4611
0.39	3.25	0.750	1.674	0.003	-250.7244
0.54	3	1.000	1.386	0.002	-181.8894
0.65	2.75	1.250	1.163	0.002	-190.2501
0.80	2.5	1.500	0.981	0.003	-113.9935
0.94	2.25	1.750	0.827	0.002	-100.8629
1.10	2	2.000	0.693	0.003	-76.6729
1.29	1.75	2.250	0.575	0.003	-60.8052
1.47	1.5	2.500	0.470	0.003	-54.8957
1.67	1.25	2.750	0.375	0.003	-44.3240
1.90	1	3.000	0.288	0.004	-34.9730
2.09	0.75	3.250	0.208	0.003	-40.5773
2.31	0.5	3.500	0.134	0.004	-31.1204
2.45	0.25	3.750	0.065	0.002	-45.1430

TEST 2

Water temperature (°C), T: 23.9 Rt= 0.91

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.20	3.75	0.250	2.773	0.004	1164.3009
0.42	3.5	0.500	2.079	0.004	-291.0752
0.64	3.25	0.750	1.674	0.004	-175.5071
0.84	3	1.000	1.386	0.003	-130.5496
1.03	2.75	1.250	1.163	0.003	-113.1217
1.26	2.5	1.500	0.981	0.004	-72.7618
1.42	2.25	1.750	0.827	0.003	-93.2711
1.65	2	2.000	0.693	0.004	-53.2904
1.91	1.75	2.250	0.575	0.004	-43.3187
2.16	1.5	2.500	0.470	0.004	-39.0049
2.44	1.25	2.750	0.375	0.005	-32.3084
2.76	1	3.000	0.288	0.005	-25.3690
3.06	0.75	3.250	0.208	0.005	-24.7477
3.31	0.5	3.500	0.134	0.004	-28.3682
3.48	0.25	3.750	0.065	0.003	-36.9743

TEST 1 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 77.1699 in/hr

TEST 2 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 53.6540 in/hr

AVERAGE IT-Y9 Loc 3 Bald @ 0 ft

Time Weighted Average Permeability Coefficient **Km=** 65.4120 in/hr

Inspectors Remarks:

DEFINITION OF VARIABLES

*Km= Mean permeability

T = Temperature of permeant (water), in °C

Ln = Natural Logarithmic

t1 = Time at the start of the test in the same units selected for Km

t2= Time at the end of the test in the units selected for Km

h1= Height of the water above the bottom of the casing at the start of the test in the same units selected for Km

h2= Height of the water above the bottom of the casing at the end of the test in the same units selected for Km

AECOM

IT ID No. IT- Y9 Loc 3 Original

Sheet 1 of 1

Prepared for: Town of Greenwich		PROJECT: Greenwich High School	
		LOCATION / BOROUGH : Greenwich, CT	
INSPECTOR: J. Christopher	TESTER: D. Hare	Start Date: 8/23/2017	Weather:
CONTRACTOR:	HELPER: J. Christopher	Start Time:	
P.E./REP.: J. Christopher			
Depth of IT: 0 ft	Drill Bit Type: N/A	Weight for casing: 50 lbs	
Rig Type: Turf Tek	Casing Internal Diameter: 6 in	Type of Hammer: Constant pressure	
	Casing Length: 4 in		

ASTM D-6391 – 11
PERMEABILITY COEFFICIENT (Km) FORMULA:

General Formula:

$$K_m = \pi R_t \times \frac{\left[D\left\{Ln\left(\frac{h_1}{h_2}\right)\right\}\right]}{11 \times (t_2 - t_1)}$$

Formula for 4" internal diameter casing (in/hr):

$$K_m = 1.142 R_t \times \frac{\left[Ln\left(\frac{h_1}{h_2}\right)\right]}{(t_2 - t_1)}$$

where:

$$R_t = {2.2902(0.9842^T)}/{T^{0.1702}}$$

IT-Y9 Loc 3 Original @ 0 ft

TEST 1

Water temperature (°C), T: 23.9 Rt= 0.91

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.19	3.75	0.250	2.773	0.002	2000.2092
0.32	3.5	0.500	2.079	0.002	-500.0523
0.41	3.25	0.750	1.674	0.002	-422.5171
0.53	3	1.000	1.386	0.002	-224.8355
0.64	2.75	1.250	1.163	0.002	-196.1955
0.74	2.5	1.500	0.981	0.002	-162.8479
0.83	2.25	1.750	0.827	0.001	-166.8118
0.98	2	2.000	0.693	0.002	-86.3672
1.10	1.75	2.250	0.575	0.002	-86.0749
1.25	1.5	2.500	0.470	0.002	-69.7499
1.39	1.25	2.750	0.375	0.002	-63.8476
1.52	1	3.000	0.288	0.002	-60.4471
1.70	0.75	3.250	0.208	0.003	-42.8960
1.86	0.5	3.500	0.134	0.003	-42.9910
2.06	0.25	3.750	0.065	0.003	-32.6243

TEST 2

Water temperature (°C), T: 23.9 Rt= 0.91

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.33	3.75	0.250	2.773	0.003	1393.0028
0.51	3.5	0.500	2.079	0.003	-348.2507
0.65	3.25	0.750	1.674	0.002	-274.8906
0.80	3	1.000	1.386	0.002	-181.8894
0.94	2.75	1.250	1.163	0.002	-146.0059
1.10	2.5	1.500	0.981	0.003	-109.1427
1.27	2.25	1.750	0.827	0.003	-84.2156
1.48	2	2.000	0.693	0.003	-61.5897
1.66	1.75	2.250	0.575	0.003	-60.8052
1.91	1.5	2.500	0.470	0.004	-38.7499
2.10	1.25	2.750	0.375	0.003	-47.8857
2.37	1	3.000	0.288	0.004	-30.6014
2.61	0.75	3.250	0.208	0.004	-30.6400
2.86	0.5	3.500	0.134	0.004	-28.1765
3.25	0.25	3.750	0.065	0.007	-16.5204

TEST 1 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 100.9068 in/hr

TEST 2 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 68.5096 in/hr

AVERAGE IT-Y9 Loc 3 Original @ 0 ft

Time Weighted Average Permeability Coefficient **Km=** 84.7082 in/hr

Inspectors Remarks:

DEFINITION OF VARIABLES

*Km= Mean permeability

T = Temperature of permeant (water), in °C

Ln = Natural Logarithmic

t1 = Time at the start of the test in the same units selected for Km

t2= Time at the end of the test in the units selected for Km

h1= Height of the water above the bottom of the casing at the start of the test in the same units selected for Km

h2= Height of the water above the bottom of the casing at the end of the test in the same units selected for Km

AECOM

IT ID No. IT- Y15 Loc 1

Sheet 1 of 1

Prepared for:	Town of Greenwich		PROJECT:	Greenwich High School	
			LOCATION / BOROUGH :	Greenwich, CT	
INSPECTOR:	J. Christopher	TESTER: D. Hare	Start Date:	8/23/2017	Weather:
CONTRACTOR:		HELPER: J. Christopher	Start Time:		
P.E./REP.:	J. Christopher				
Depth of IT:	0 ft	Drill Bit Type:	N/A	Weight for casing:	50 lbs
Rig Type:	Turf Tek	Casing Internal Diameter:	6 in	Type of Hammer:	Constant pressure
		Casing Length:	4 in		

ASTM D-6391 – 11
PERMEABILITY COEFFICIENT (Km) FORMULA:

General Formula:

$$K_m = \pi R_t \times \frac{\left[D\left\{Ln\left(\frac{h_1}{h_2}\right)\right\}\right]}{11 \times (t_2 - t_1)}$$

Formula for 4" internal diameter casing (in/hr):

$$K_m = 1.142 R_t \times \frac{\left[Ln\left(\frac{h_1}{h_2}\right)\right]}{(t_2 - t_1)}$$

where:

$$R_t = {2.2902(0.9842^{T})}/{T^{0.1702}}$$

IT-Y15 Loc 1 @ 0 ft

TEST 1

Water temperature (°C), T: 26.7 Rt= 0.86

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.30	3.75	0.250	2.773	0.004	1031.6630
0.54	3.5	0.500	2.079	0.004	-257.9158
0.88	3.25	0.750	1.674	0.006	-104.5058
1.10	3	1.000	1.386	0.004	-114.2883
1.35	2.75	1.250	1.163	0.004	-81.3125
1.69	2.5	1.500	0.981	0.006	-46.9921
2.14	2.25	1.750	0.827	0.008	-29.9445
2.74	2	2.000	0.693	0.010	-19.7079
3.02	1.75	2.250	0.575	0.005	-37.0437
3.37	1.5	2.500	0.470	0.006	-26.1360
3.83	1.25	2.750	0.375	0.008	-18.5145
4.22	1	3.000	0.288	0.007	-19.3170
4.69	0.75	3.250	0.208	0.008	-15.1586
5.24	0.5	3.500	0.134	0.009	-11.7942
	0.25	3.750	0.065	#VALUE!	-

TEST 2

Water temperature (°C), T: 26.7 Rt= 0.86

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.66	3.75	0.250	2.773	0.007	544.5953
1.11	3.5	0.500	2.079	0.007	-136.1488
1.48	3.25	0.750	1.674	0.006	-97.3804
1.74	3	1.000	1.386	0.004	-97.4381
2.16	2.75	1.250	1.163	0.007	-46.9733
2.89	2.5	1.500	0.981	0.012	-21.8444
3.26	2.25	1.750	0.827	0.006	-36.8548
3.68	2	2.000	0.693	0.007	-27.9978
4.06	1.75	2.250	0.575	0.006	-27.2953
4.63	1.5	2.500	0.470	0.009	-16.3254
5.30	1.25	2.750	0.375	0.011	-12.4344
5.83	1	3.000	0.288	0.009	-14.5030
6.34	0.75	3.250	0.208	0.008	-13.9579
6.99	0.5	3.500	0.134	0.011	-9.9889
7.66	0.25	3.750	0.065	0.011	-9.0682

TEST 1 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 35.1121 in/hr

TEST 2 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 23.9078 in/hr

AVERAGE IT-Y15 Loc 1 @ 0 ft

Time Weighted Average Permeability Coefficient **Km=** 29.5099 in/hr

Inspectors Remarks:

DEFINITION OF VARIABLES

*Km= Mean permeability

T = Temperature of permeant (water), in °C

Ln = Natural Logarithmic

t1 = Time at the start of the test in the same units selected for Km

t2= Time at the end of the test in the units selected for Km

h1= Height of the water above the bottom of the casing at the start of the test in the same units selected for Km

h2= Height of the water above the bottom of the casing at the end of the test in the same units selected for Km

AECOM

IT ID No. IT- Y15 Loc 2

Sheet 1 of 1

Prepared for: Town of Greenwich			PROJECT: Greenwich High School		
			LOCATION / BOROUGH : Greenwich, CT		
INSPECTOR: J. Christopher	TESTER: D. Hare		Start Date: 8/23/2017	Weather:	
CONTRACTOR:	HELPER: J. Christopher		Start Time:		
P.E./REP.: J. Christopher					
Depth of IT: 0 ft	Drill Bit Type: N/A		Weight for casing: 50 lbs		
Rig Type: Turf Tek	Casing Internal Diameter: 6 in		Type of Hammer: Constant pressure		
	Casing Length: 4 in				

ASTM D-6391 – 11
PERMEABILITY COEFFICIENT (Km) FORMULA:

General Formula:

$$K_m = \pi R_t \times \frac{\left[D\left\{Ln\left(\frac{h_1}{h_2}\right)\right\}\right]}{11 \times (t_2 - t_1)}$$

Formula for 4" internal diameter casing (in/hr):

$$K_m = 1.142 R_t \times \frac{\left[Ln\left(\frac{h_1}{h_2}\right)\right]}{(t_2 - t_1)}$$

where:

$$R_t = {2.2902(0.9842^T)}/{T^{0.1702}}$$

IT-Y15 Loc 2 @ 0 ft

TEST 1

Water temperature (°C), T: 26.7 Rt= 0.86

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.17	3.75	0.250	2.773	0.005	856.7026
0.46	3.5	0.500	2.079	0.005	-214.1757
0.82	3.25	0.750	1.674	0.006	-97.8251
1.22	3	1.000	1.386	0.007	-64.1365
1.78	2.75	1.250	1.163	0.009	-35.1949
2.42	2.5	1.500	0.981	0.011	-24.8925
3.10	2.25	1.750	0.827	0.011	-20.1607
3.69	2	2.000	0.693	0.010	-19.8745
4.25	1.75	2.250	0.575	0.009	-18.3039
5.00	1.5	2.500	0.470	0.012	-12.5100
5.82	1.25	2.750	0.375	0.014	-10.1736
6.71	1	3.000	0.288	0.015	-8.5934
7.26	0.75	3.250	0.208	0.009	-12.8940
8.65	0.5	3.500	0.134	0.023	-4.7007
9.58	0.25	3.750	0.065	0.016	-6.4980

TEST 2

Water temperature (°C), T: 26.7 Rt= 0.86

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.58	3.75	0.250	2.773	0.011	372.7637
1.23	3.5	0.500	2.079	0.011	-93.1909
1.96	3.25	0.750	1.674	0.012	-48.8011
2.92	3	1.000	1.386	0.016	-26.6206
3.91	2.75	1.250	1.163	0.017	-19.7493
5.31	2.5	1.500	0.981	0.023	-11.4683
6.69	2.25	1.750	0.827	0.023	-9.8487
7.84	2	2.000	0.693	0.019	-10.2550
9.20	1.75	2.250	0.575	0.023	-7.6266
10.41	1.5	2.500	0.470	0.020	-7.6260
12.32	1.25	2.750	0.375	0.032	-4.3905
14.09	1	3.000	0.288	0.030	-4.3290
15.62	0.75	3.250	0.208	0.025	-4.6272
16.72	0.5	3.500	0.134	0.018	-5.9149
17.99	0.25	3.750	0.065	0.021	-4.7777

TEST 1 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 22.7024 in/hr

TEST 2 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 10.7585 in/hr

AVERAGE IT-Y15 Loc 2 @ 0 ft

Time Weighted Average Permeability Coefficient **Km=** 16.7305 in/hr

Inspectors Remarks:

DEFINITION OF VARIABLES

*Km= Mean permeability

T = Temperature of permeant (water), in °C

Ln = Natural Logarithmic

t1 = Time at the start of the test in the same units selected for Km

t2= Time at the end of the test in the units selected for Km

h1= Height of the water above the bottom of the casing at the start of the test in the same units selected for Km

h2= Height of the water above the bottom of the casing at the end of the test in the same units selected for Km

AECOM

IT ID No. IT- Y15 Loc 3

Sheet 1 of 1

Prepared for: Town of Greenwich			PROJECT: Greenwich High School LOCATION / BOROUGH : Greenwich, CT		
INSPECTOR: J. Christopher	TESTER: D. Hare		Start Date: 8/23/2017	Weather:	
CONTRACTOR:	HELPER: J. Christopher		Start Time:		
P.E./REP.: J. Christopher					
Depth of IT: 0 ft	Drill Bit Type: N/A		Weight for casing: 50 lbs		
Rig Type: Turf Tek	Casing Internal Diameter: 6 in		Type of Hammer: Constant pressure		
	Casing Length: 4 in				

ASTM D-6391 – 11
PERMEABILITY COEFFICIENT (Km) FORMULA:

General Formula:

$$K_m = \pi R_t \times \frac{\left[D\left\{Ln\left(\frac{h_1}{h_2}\right)\right\}\right]}{11 \times (t_2 - t_1)}$$

Formula for 4" internal diameter casing (in/hr):

$$K_m = 1.142 R_t \times \frac{\left[Ln\left(\frac{h_1}{h_2}\right)\right]}{(t_2 - t_1)}$$

where:

$$R_t = {2.2902(0.9842^T)}/{T^{0.1702}}$$

IT-Y15 Loc 3 @ 0 ft

TEST 1

Water temperature (°C), T: 26.7 Rt= 0.86

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.04	3.75	0.250	2.773	0.001	3116.9393
0.12	3.5	0.500	2.079	0.001	-779.2348
0.20	3.25	0.750	1.674	0.001	-465.7324
0.30	3	1.000	1.386	0.002	-245.1669
0.40	2.75	1.250	1.163	0.002	-206.8475
0.67	2.5	1.500	0.981	0.005	-58.7401
0.77	2.25	1.750	0.827	0.002	-140.4295
0.92	2	2.000	0.693	0.003	-75.8650
1.09	1.75	2.250	0.575	0.003	-62.2334
1.38	1.5	2.500	0.470	0.005	-31.8112
1.61	1.25	2.750	0.375	0.004	-36.7586
1.92	1	3.000	0.288	0.005	-24.7175
2.14	0.75	3.250	0.208	0.004	-31.0974
2.54	0.5	3.500	0.134	0.007	-16.3153
2.93	0.25	3.750	0.065	0.007	-15.5786

TEST 2

Water temperature (°C), T: 26.7 Rt= 0.86

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.14	3.75	0.250	2.773	0.003	1382.0391
0.32	3.5	0.500	2.079	0.003	-345.5098
0.54	3.25	0.750	1.674	0.004	-157.5271
0.82	3	1.000	1.386	0.005	-93.2537
1.06	2.75	1.250	1.163	0.004	-80.7555
1.40	2.5	1.500	0.981	0.006	-46.5381
1.76	2.25	1.750	0.827	0.006	-38.0603
2.09	2	2.000	0.693	0.006	-35.6335
2.46	1.75	2.250	0.575	0.006	-27.9074
2.94	1.5	2.500	0.470	0.008	-19.5332
3.32	1.25	2.750	0.375	0.006	-21.8954
3.86	1	3.000	0.288	0.009	-14.3223
4.19	0.75	3.250	0.208	0.006	-21.1462
4.66	0.5	3.500	0.134	0.008	-13.9845
5.18	0.25	3.750	0.065	0.009	-11.6466

TEST 1 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 90.8097 in/hr

TEST 2 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 40.5190 in/hr

AVERAGE IT-Y15 Loc 3 @ 0 ft

Time Weighted Average Permeability Coefficient **Km=** 65.6644 in/hr

Inspectors Remarks:

DEFINITION OF VARIABLES

*Km= Mean permeability
T = Temperature of permeant (water), in °C
Ln = Natural Logarithmic
t1 = Time at the start of the test in the same units selected for Km
t2= Time at the end of the test in the units selected for Km
h1= Height of the water above the bottom of the casing at the start of the test in the same units selected for Km
h2= Height of the water above the bottom of the casing at the end of the test in the same units selected for Km

AECOM

IT ID No. IT- Field #5 Loc 1

Sheet 1 of 1

Prepared for:	Town of Greenwich		PROJECT:	Greenwich High School	
			LOCATION / BOROUGH :	Greenwich, CT	
INSPECTOR:	J. Christopher	TESTER: D. Hare	Start Date:	8/23/2017	Weather:
CONTRACTOR:		HELPER: J. Christopher	Start Time:		
P.E./REP.:	J. Christopher				
Depth of IT:	0 ft	Drill Bit Type:	N/A	Weight for casing:	50 lbs
Rig Type:	Turf Tek	Casing Internal Diameter:	6 in	Type of Hammer:	Constant pressure
		Casing Length:	4 in		

ASTM D-6391 – 11
PERMEABILITY COEFFICIENT (Km) FORMULA:

General Formula:

$$K_m = \pi R_t \times \frac{\left[D\left\{Ln\left(\frac{h_1}{h_2}\right)\right\}\right]}{11 \times (t_2 - t_1)}$$

Formula for 4" internal diameter casing (in/hr):

$$K_m = 1.142 R_t \times \frac{\left[Ln\left(\frac{h_1}{h_2}\right)\right]}{(t_2 - t_1)}$$

where:

$$R_t = {2.2902(0.9842^T)}/{T^{0.1702}}$$

IT-Field #5 Loc 1 @ 0 ft

TEST 1

Water temperature (°C), T: 23.9 Rt= 0.91

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
1.30	3.75	0.250	2.773	0.027	159.3629
2.93	3.5	0.500	2.079	0.027	-39.8407
5.01	3.25	0.750	1.674	0.035	-18.3408
7.37	3	1.000	1.386	0.039	-11.4001
9.60	2.75	1.250	1.163	0.037	-9.4197
12.43	2.5	1.500	0.981	0.047	-6.0279
16.03	2.25	1.750	0.827	0.060	-4.0158
20.32	2	2.000	0.693	0.071	-2.9237
24.22	1.75	2.250	0.575	0.065	-2.8312
29.97	1.5	2.500	0.470	0.096	-1.7175
35.57	1.25	2.750	0.375	0.093	-1.5962
41.43	1	3.000	0.288	0.098	-1.3926
47.29	0.75	3.250	0.208	0.098	-1.2807
52.88	0.5	3.500	0.134	0.093	-1.2430
59.60	0.25	3.750	0.065	0.112	-0.9638

TEST 2

Water temperature (°C), T: 23.9 Rt= 0.91

FIELD DATA		CALCULATED DATA			
Time (min)	Depth (in)	Height (in)	Ln (H/Ho)	(t_1-t_2)	*Kv (in/hr)
0.00	3.75	0.250	2.773	0.000	-
0.00	3.5	0.500	2.079	0.000	-
0.00	3.25	0.750	1.674	0.000	-
0.00	3	1.000	1.386	0.000	-
0.00	2.75	1.250	1.163	0.000	-
0.00	2.5	1.500	0.981	0.000	-
0.00	2.25	1.750	0.827	0.000	-
0.00	2	2.000	0.693	0.000	-
0.00	1.75	2.250	0.575	0.000	-
0.00	1.5	2.500	0.470	0.000	-
0.00	1.25	2.750	0.375	0.000	-
0.00	1	3.000	0.288	0.000	-
0.00	0.75	3.250	0.208	0.000	-
0.00	0.5	3.500	0.134	0.000	-
0.00	0.25	3.750	0.065	0.000	-

TEST 1 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** 4.7385 in/hr

TEST 2 FINAL RESULTS

Time Weighted Average Permeability Coefficient **Km=** #DIV/0! in/hr

AVERAGE IT-Field #5 Loc 1 @ 0 ft

Time Weighted Average Permeability Coefficient **Km=** #DIV/0! in/hr

Inspectors Remarks:

DEFINITION OF VARIABLES

*Km= Mean permeability

T = Temperature of permeant (water), in °C

Ln = Natural Logarithmic

t1 = Time at the start of the test in the same units selected for Km

t2= Time at the end of the test in the units selected for Km

h1= Height of the water above the bottom of the casing at the start of the test in the same units selected for Km

h2= Height of the water above the bottom of the casing at the end of the test in the same units selected for Km

Infiltration Test Summary

The infiltration tests were performed using a modified borehole infiltration method, based on American Society for Testing and Materials (ASTM) test method D6391-11 and employing a double-ring infiltrometer, as described D3385: Standard Test Method for Infiltration Rate of Soils in Field Using Double Ring Infiltrometer) to avoid excessively disturbing soils on the athletic fields where the tests were conducted. The infiltration test calculates the hydraulic conductivity of the soil, which controls the rate at which water can enter the soil in the presence of excess liquid.

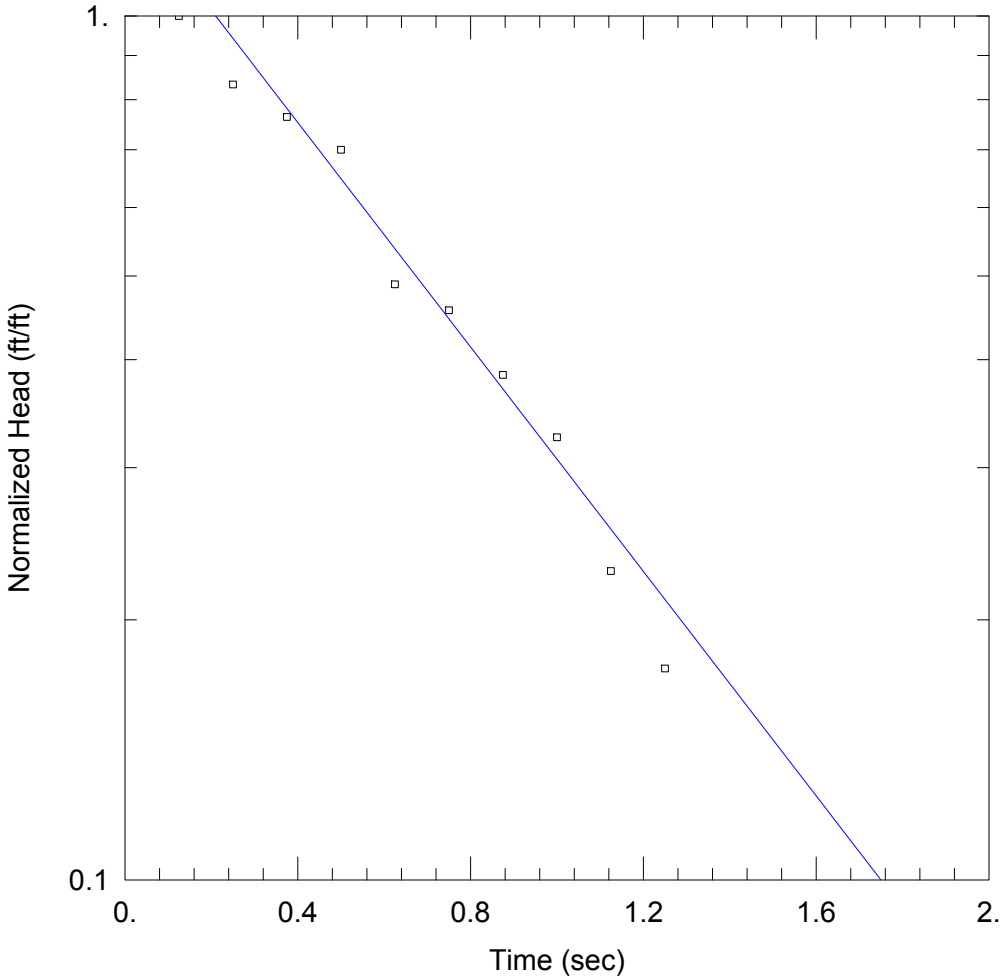
The test performed was a falling head test performed within the inner ring of the double-ring infiltrometer. For each test, the inner ring was advanced approximately 4 inches below grade, and the outer ring was pushed approximately 6 inches below that. Both rings were filled with water, and the change in water levels over time were recorded during each test, and the results were analyzed using the equations given in ASTM test method D6391-11.

Because the rate of infiltration is affected greatly by the saturation of the soil, both a “dry” and a “wet” test were performed at each location three separate times to ensure repeatability, except for the final test at Field #5, where only one infiltration test was performed due to time constraints. The data and calculations are presented in the tables that follow.

All results indicate a generally high permeability, but also show declining infiltration capacity with increasing moisture content. The results from infiltration tests performed on 08/23/2017 are presented in the table below.

	Infiltration Rate (in/hr)	
Infiltration Location/Test #	**Test 1 (Dry)**	**Test 2 (Wet)**
Y9 LOC 1 (Grass)	102.7	67.3
Y9 LOC 2 (Grass)	64.9	44.5
Y9 LOC 3 (Grass)	100.9	68.5
Y9 LOC 3 (Bald Soil - No Grass)	77.2	53.7
Y9 Infiltration Test Median	**71.1**	**49.1**
Y15 LOC 1 (Grass)	35.1	23.9
Y15 LOC 2 (Grass)	22.7	10.8
Y15 LOC 3 (Grass)	90.8	40.5
Y15 Infiltration Test Median	**35.1**	**23.9**
Field #5 LOC 1 (Grass)	4.7	-

Appendix G



WELL TEST ANALYSIS

Data Set: X:\...\MW-AA12D_1.aqt
Date: 02/05/19 Time: 11:16:32

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AA12D
Test Date: 04/10/2018

AQUIFER DATA

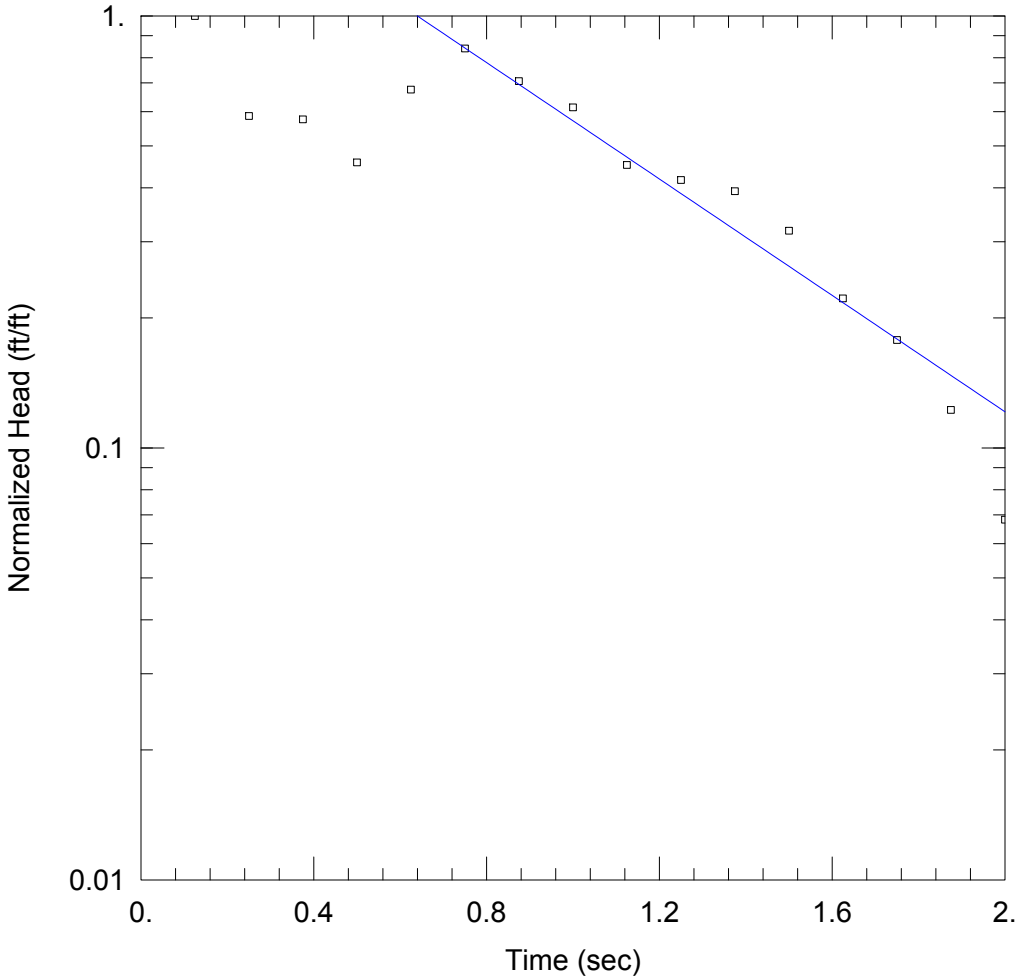
Saturated Thickness: 21.29 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AA12D)

Initial Displacement: -0.9562 ft Static Water Column Height: 21.29 ft
Total Well Penetration Depth: 30. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.06048 cm/sec y0 = -1.309 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AA12D_2.aqt
Date: 02/05/19 Time: 11:24:14

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AA12D
Test Date: 04/10/2018

AQUIFER DATA

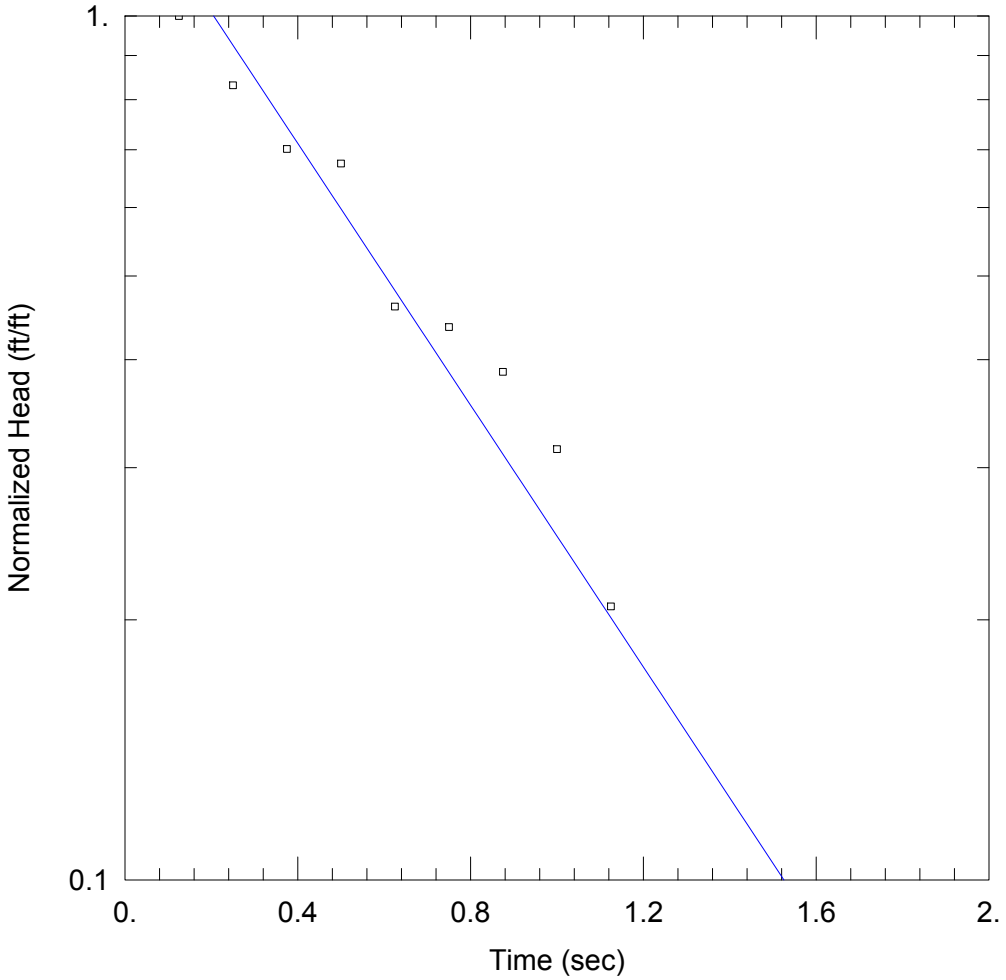
Saturated Thickness: 21.29 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AA12D)

Initial Displacement: -1.162 ft Static Water Column Height: 21.29 ft
Total Well Penetration Depth: 30. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.06273 cm/sec y0 = -3.133 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AA12D_3.aqt
Date: 02/05/19 Time: 11:26:05

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AA12D
Test Date: 04/10/2018

AQUIFER DATA

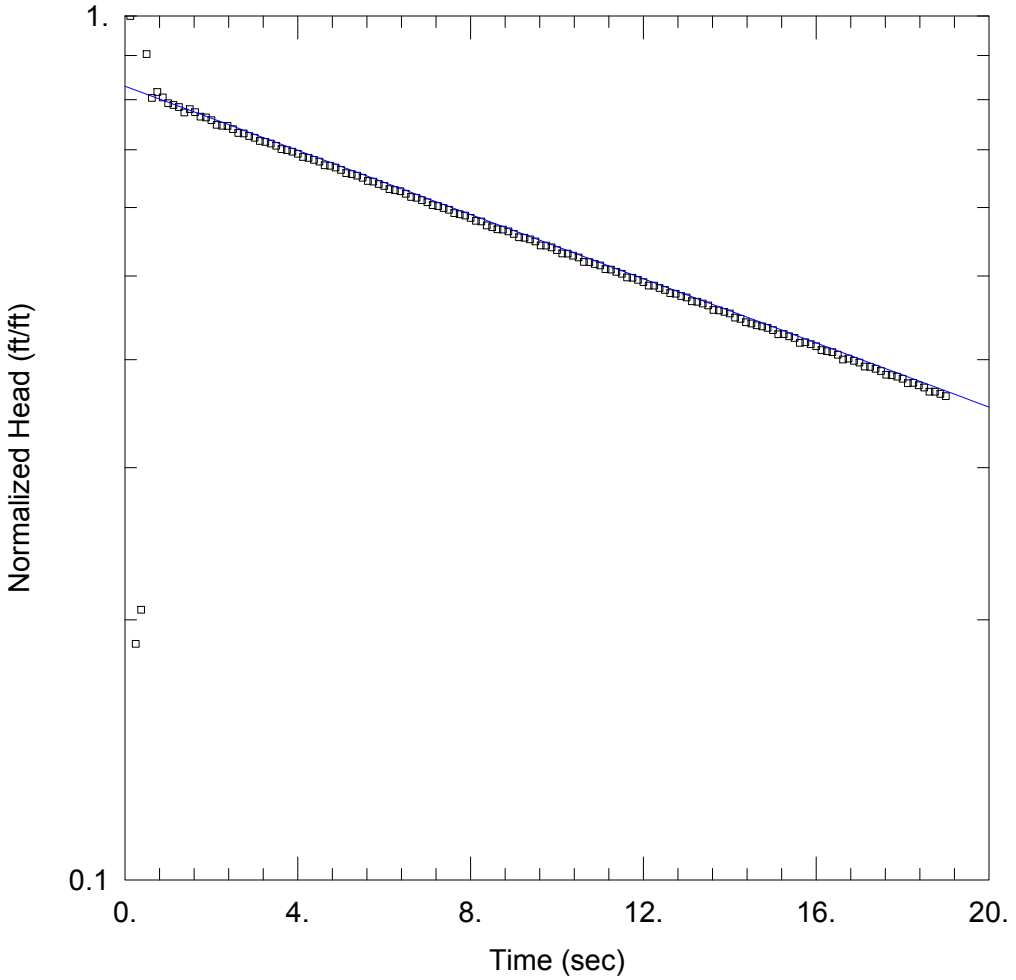
Saturated Thickness: 21.29 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AA12D)

Initial Displacement: -0.7275 ft Static Water Column Height: 21.29 ft
Total Well Penetration Depth: 30. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.07054 cm/sec y0 = -1.041 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AJ13_1.aqt
Date: 02/06/19 Time: 09:38:17

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AJ13
Test Date: 04/10/2018

AQUIFER DATA

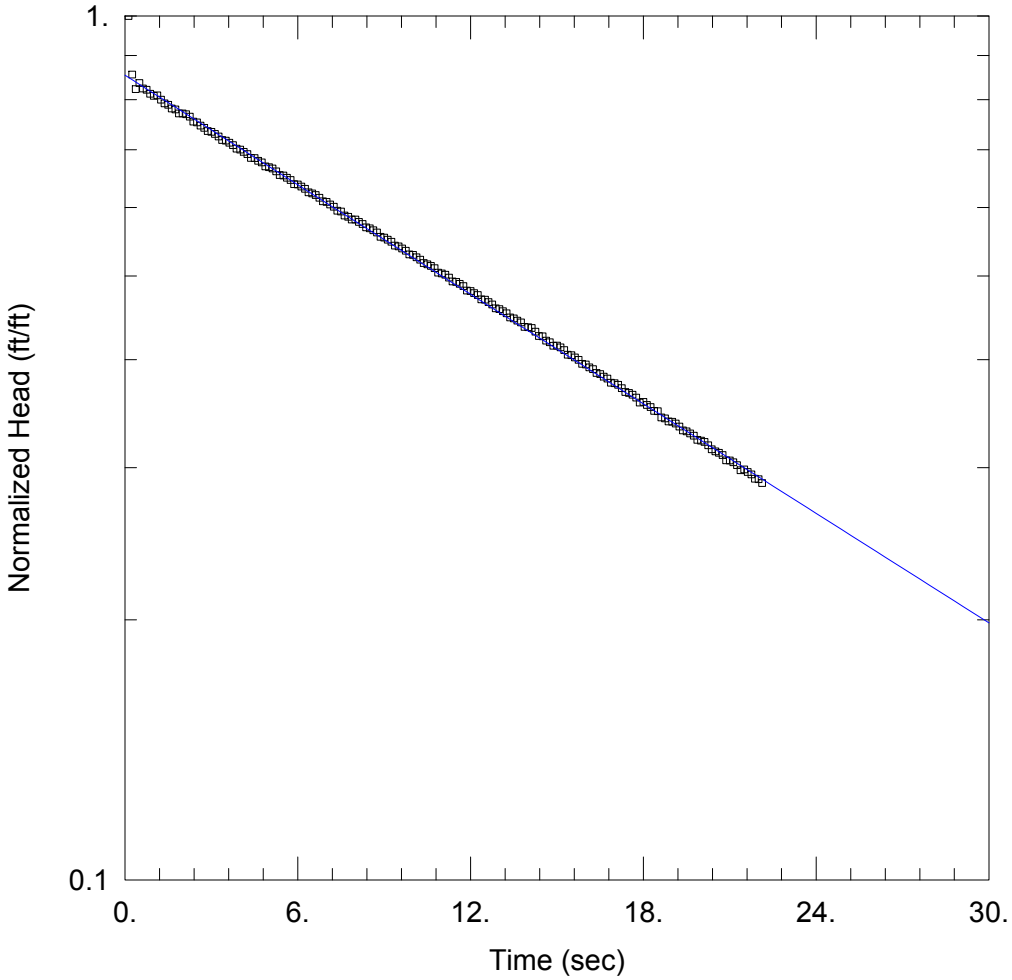
Saturated Thickness: 3.64 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AJ13)

Initial Displacement: -1.206 ft Static Water Column Height: 3.64 ft
Total Well Penetration Depth: 12. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 0.001473 cm/sec y0 = -1. ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AJ13_2.aqt
Date: 02/06/19 Time: 10:01:10

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AJ13
Test Date: 04/10/2018

AQUIFER DATA

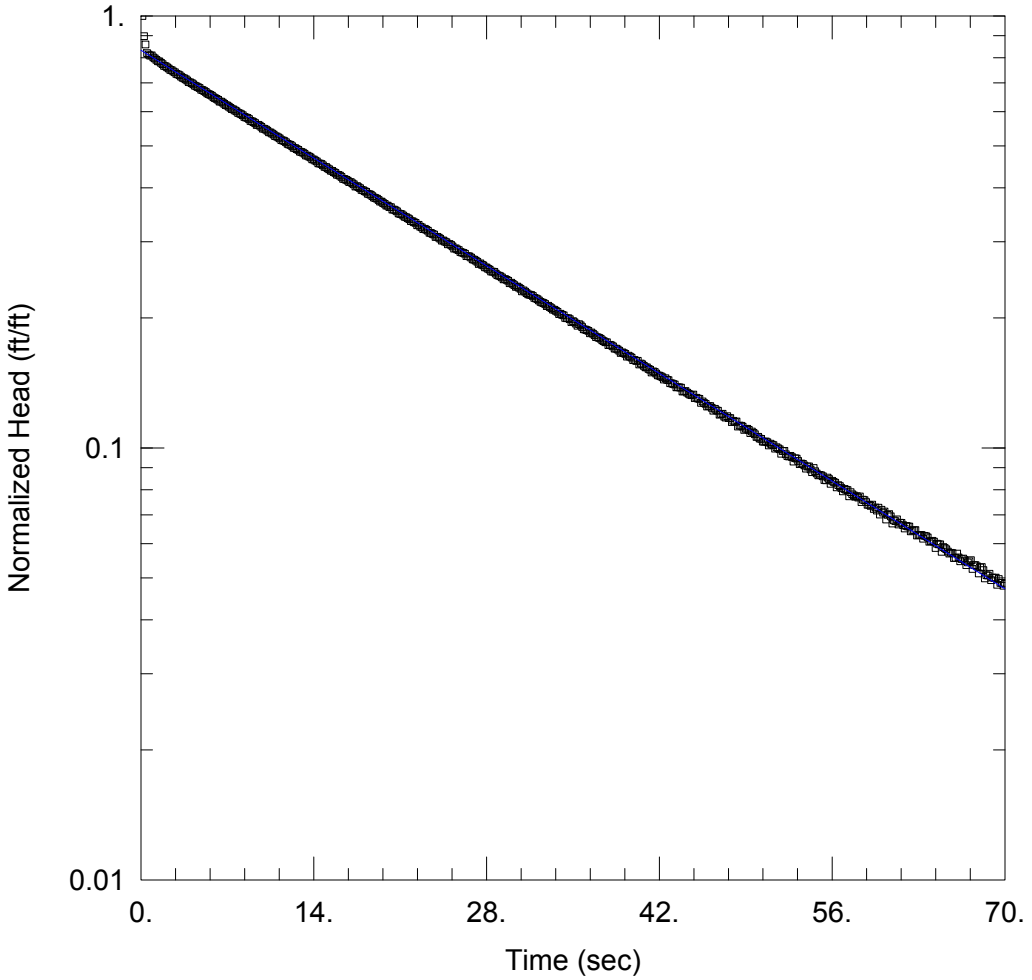
Saturated Thickness: 3.64 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AJ13)

Initial Displacement: -1.115 ft Static Water Column Height: 3.64 ft
Total Well Penetration Depth: 12. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 0.001677 cm/sec y0 = -0.9522 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AJ13_3.aqt
Date: 02/06/19 Time: 10:03:05

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AJ13
Test Date: 04/10/2018

AQUIFER DATA

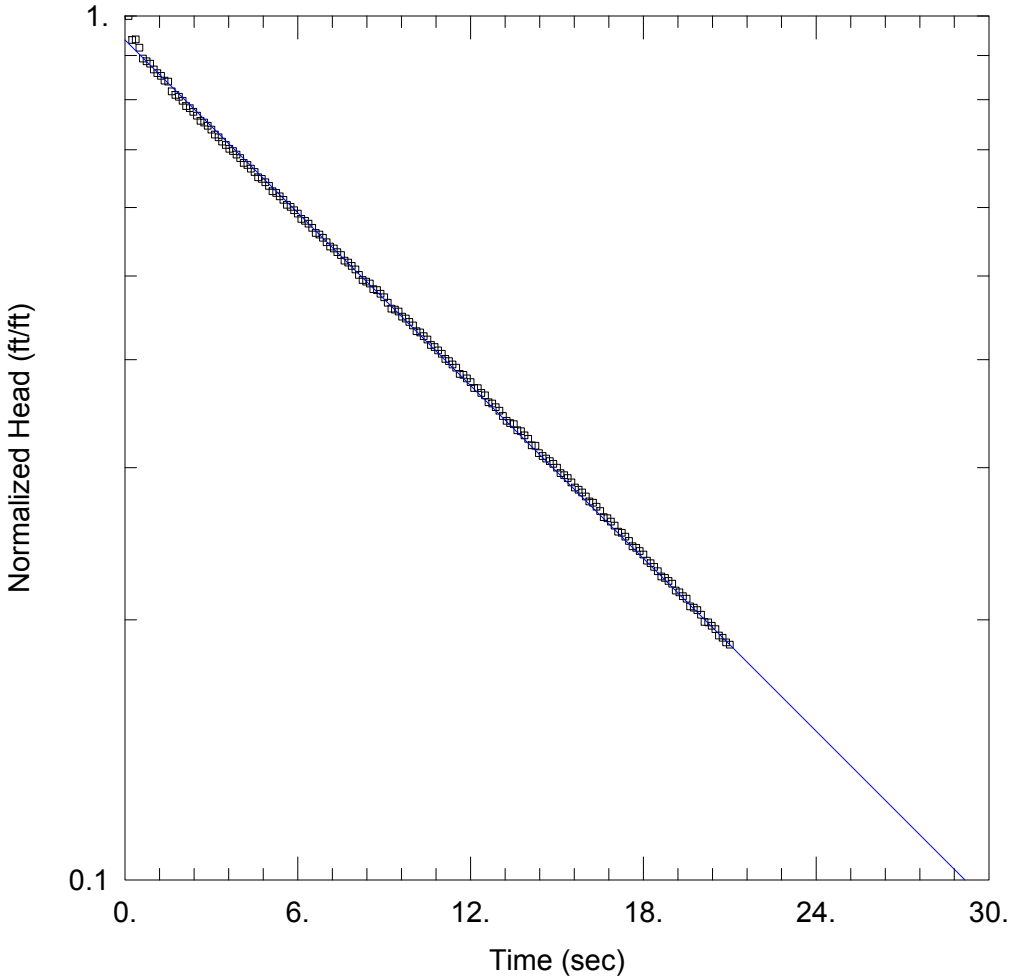
Saturated Thickness: 3.64 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AJ13)

Initial Displacement: -1.273 ft Static Water Column Height: 3.64 ft
Total Well Penetration Depth: 12. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 0.001413 cm/sec y0 = -1.06 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AJ13D_1.aqt
Date: 02/05/19 Time: 11:13:29

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AJ13D
Test Date: 04/10/2018

AQUIFER DATA

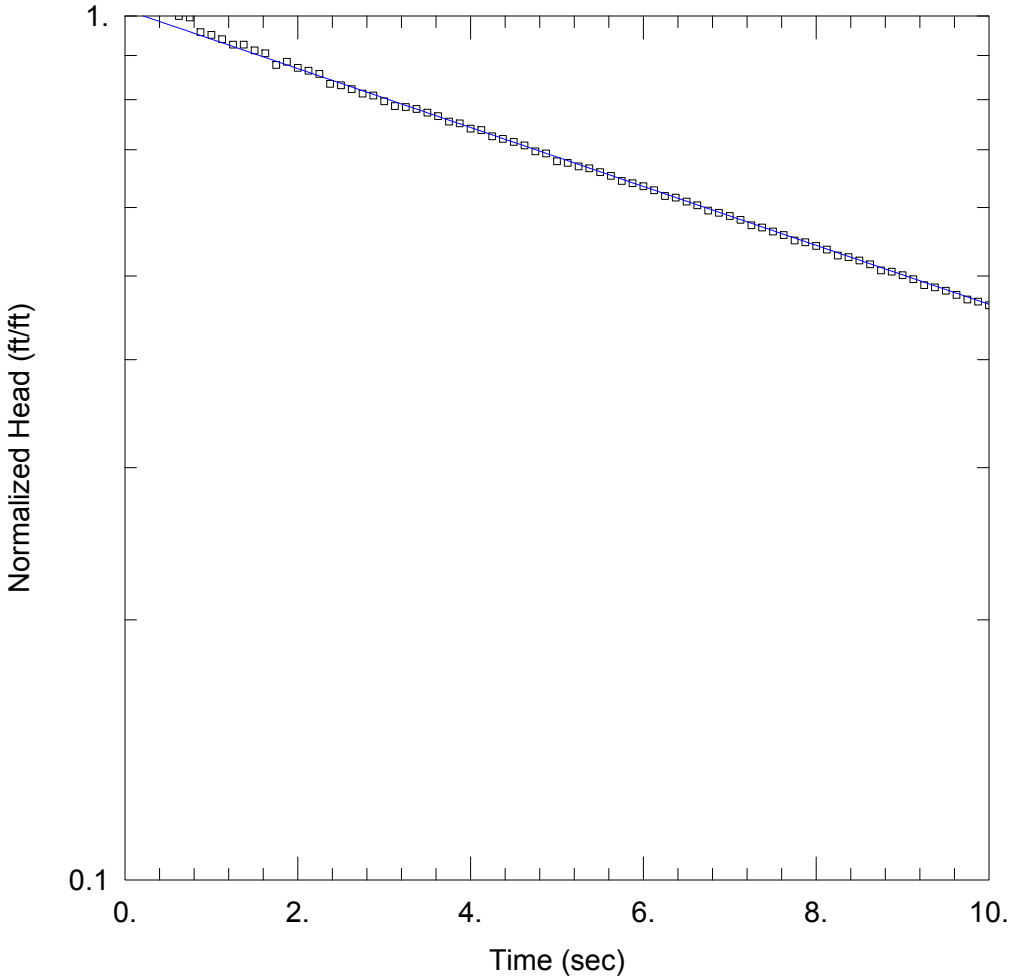
Saturated Thickness: 26.62 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AJ13D)

Initial Displacement: -1.531 ft Static Water Column Height: 26.62 ft
Total Well Penetration Depth: 35. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.003179 cm/sec y0 = -1.436 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AJ13D_2.aqt
Date: 02/07/19 Time: 08:43:41

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AJ13D
Test Date: 04/10/2018

AQUIFER DATA

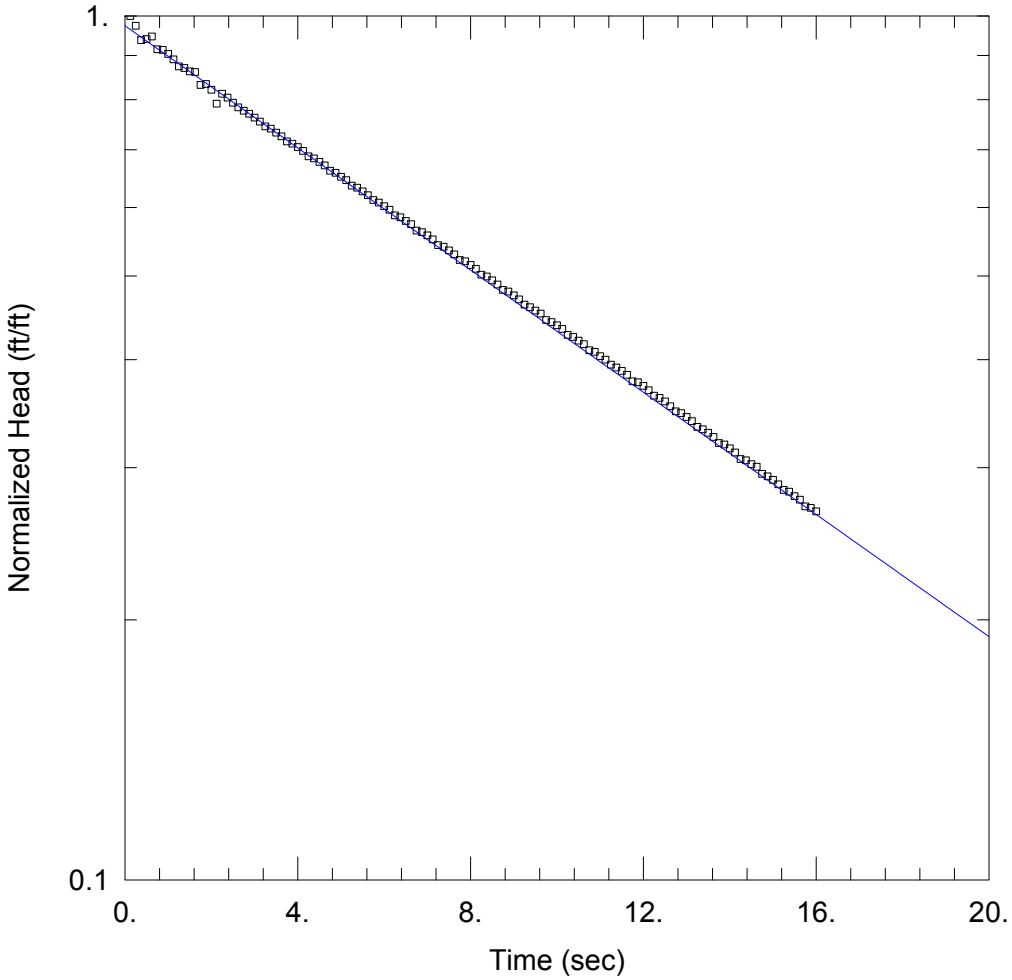
Saturated Thickness: 26.62 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AJ13D)

Initial Displacement: -1.437 ft Static Water Column Height: 26.62 ft
Total Well Penetration Depth: 35. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.003251 cm/sec y0 = -1.461 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AJ13D_3.aqt
Date: 02/05/19 Time: 11:15:27

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AJ13D
Test Date: 04/10/2018

AQUIFER DATA

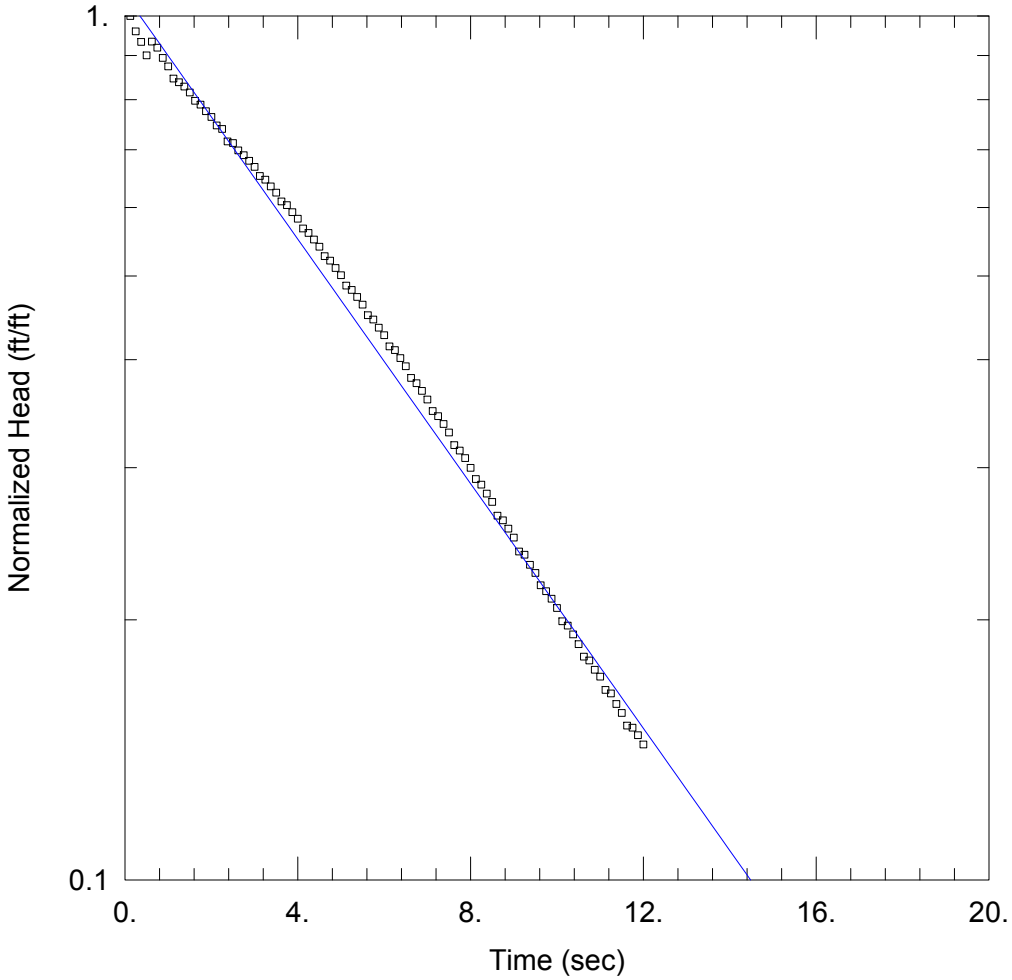
Saturated Thickness: 26.62 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AJ13D)

Initial Displacement: -1.464 ft Static Water Column Height: 26.62 ft
Total Well Penetration Depth: 35. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.00337 cm/sec y0 = -1.426 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AM16_1.aqt
Date: 02/06/19 Time: 14:51:33

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AM16
Test Date: 04/10/2018

AQUIFER DATA

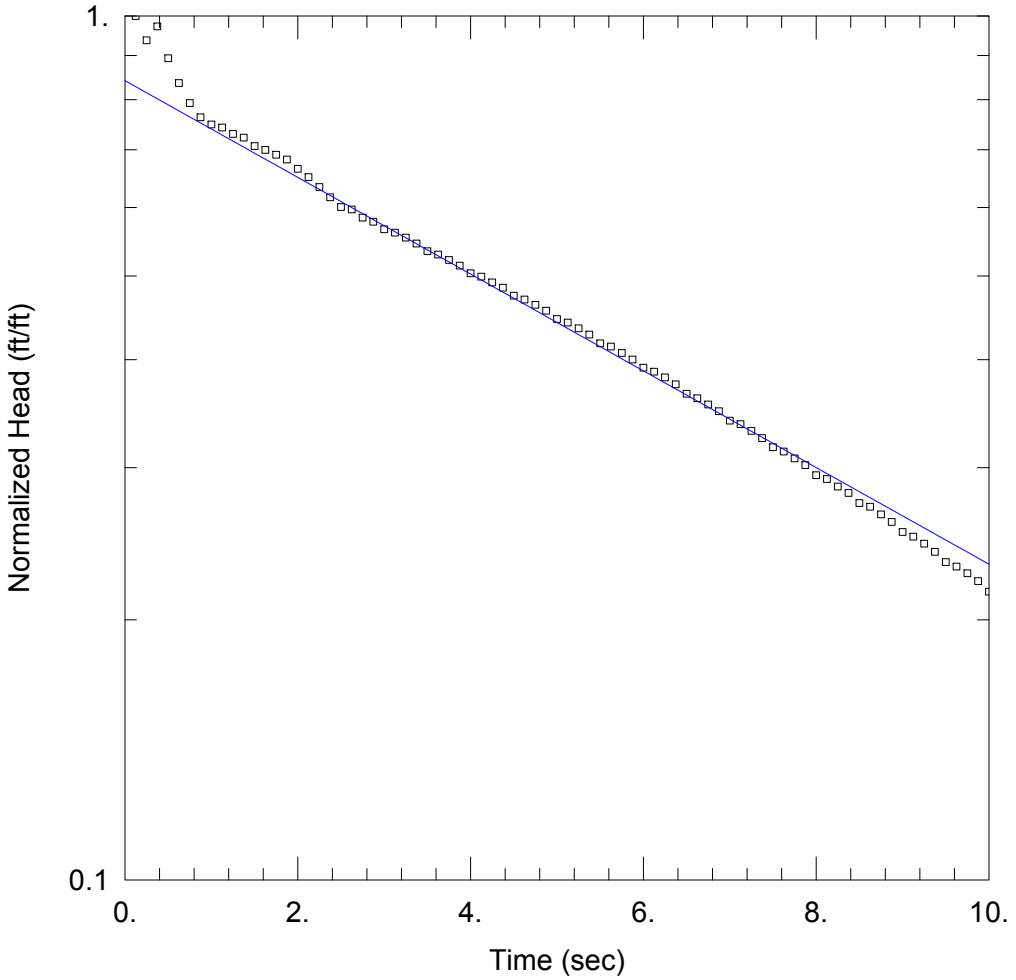
Saturated Thickness: 2.65 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AM16)

Initial Displacement: -1.529 ft Static Water Column Height: 2.65 ft
Total Well Penetration Depth: 9. ft Screen Length: 4. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 0.01231 cm/sec y0 = -1.618 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AM16_2.aqt
Date: 02/06/19 Time: 14:52:56

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AM16
Test Date: 04/10/2018

AQUIFER DATA

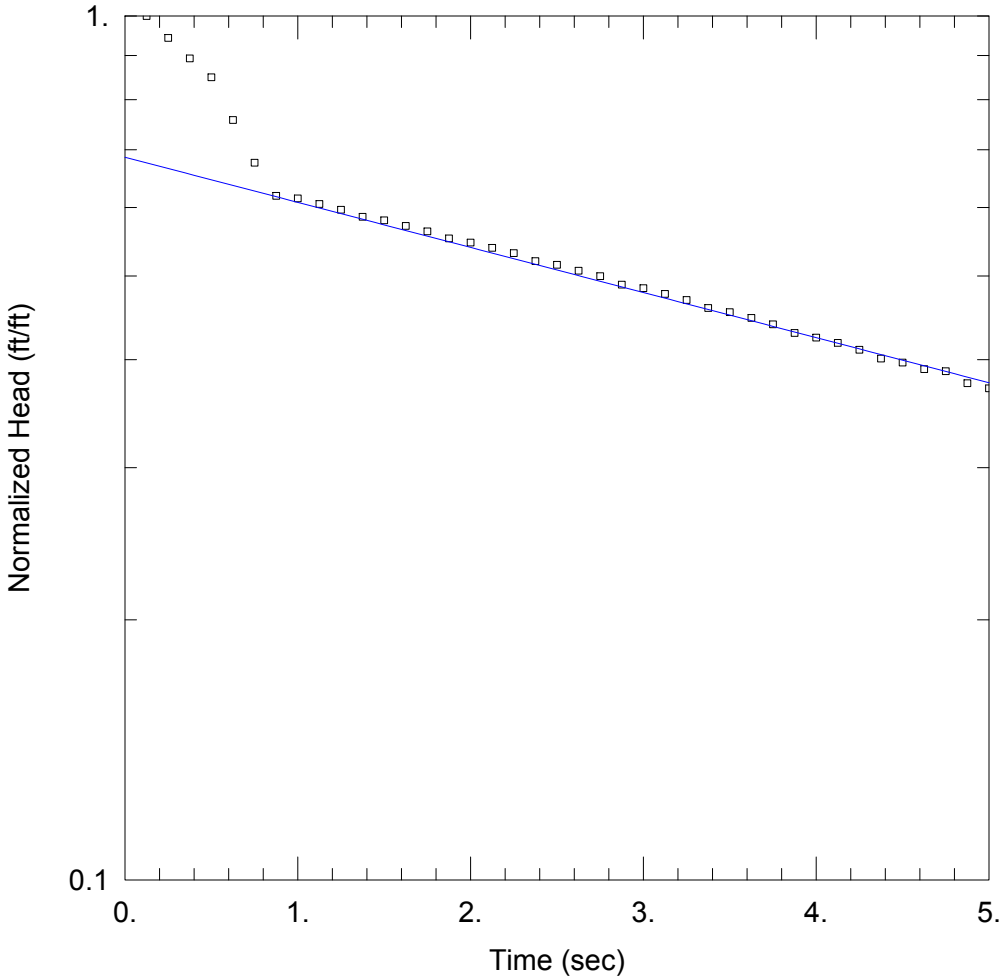
Saturated Thickness: 2.65 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AM16)

Initial Displacement: -2.2 ft Static Water Column Height: 2.65 ft
Total Well Penetration Depth: 9. ft Screen Length: 4. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 0.009738 cm/sec y0 = -1.851 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AM16_3.aqt
Date: 02/06/19 Time: 14:54:41

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AM16
Test Date: 04/10/2018

AQUIFER DATA

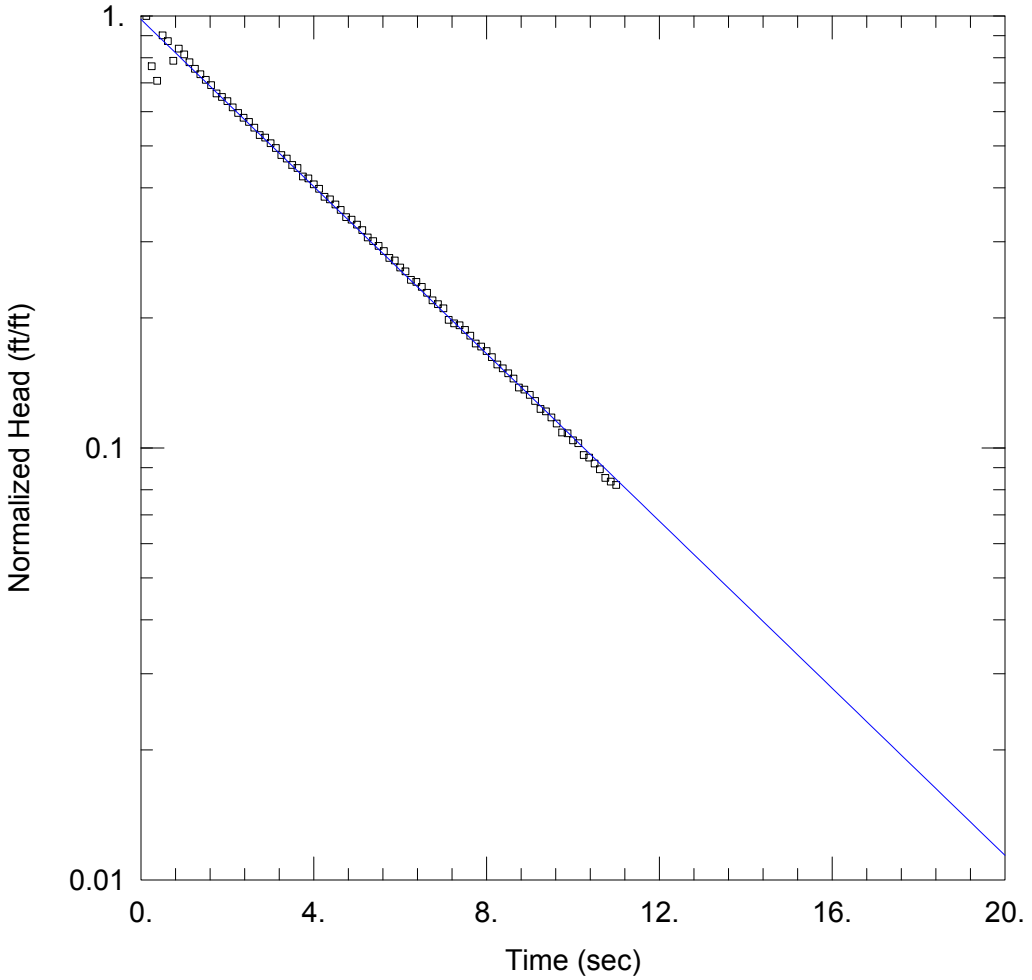
Saturated Thickness: 2.65 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AM16)

Initial Displacement: -2.238 ft Static Water Column Height: 2.65 ft
Total Well Penetration Depth: 9. ft Screen Length: 4. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 0.009082 cm/sec y0 = -1.536 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AM16D_1.aqt
Date: 02/05/19 Time: 11:32:28

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AM16D
Test Date: 04/10/2018

AQUIFER DATA

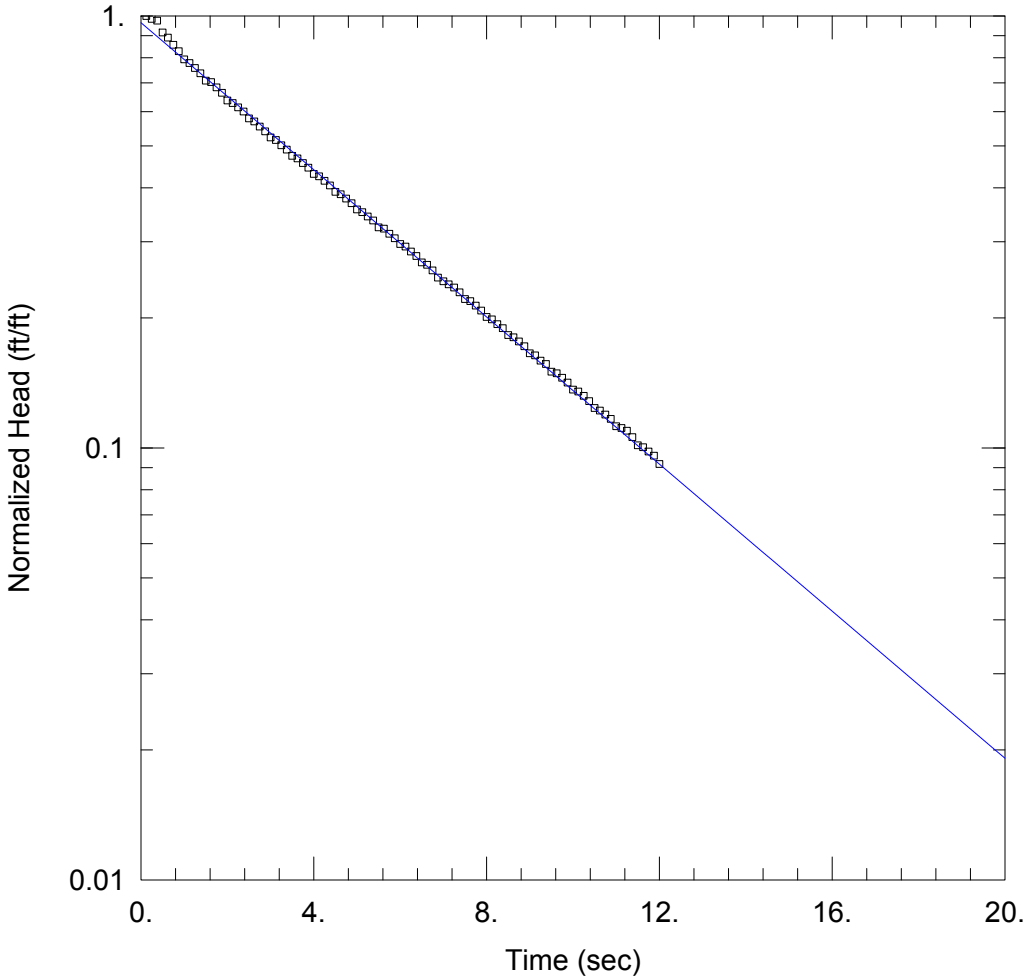
Saturated Thickness: 22.15 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AM16D)

Initial Displacement: -1.826 ft Static Water Column Height: 22.15 ft
Total Well Penetration Depth: 30. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.009009 cm/sec y0 = -1.792 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AM16D_2.aqt
Date: 02/05/19 Time: 11:34:58

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AM16D
Test Date: 04/10/2018

AQUIFER DATA

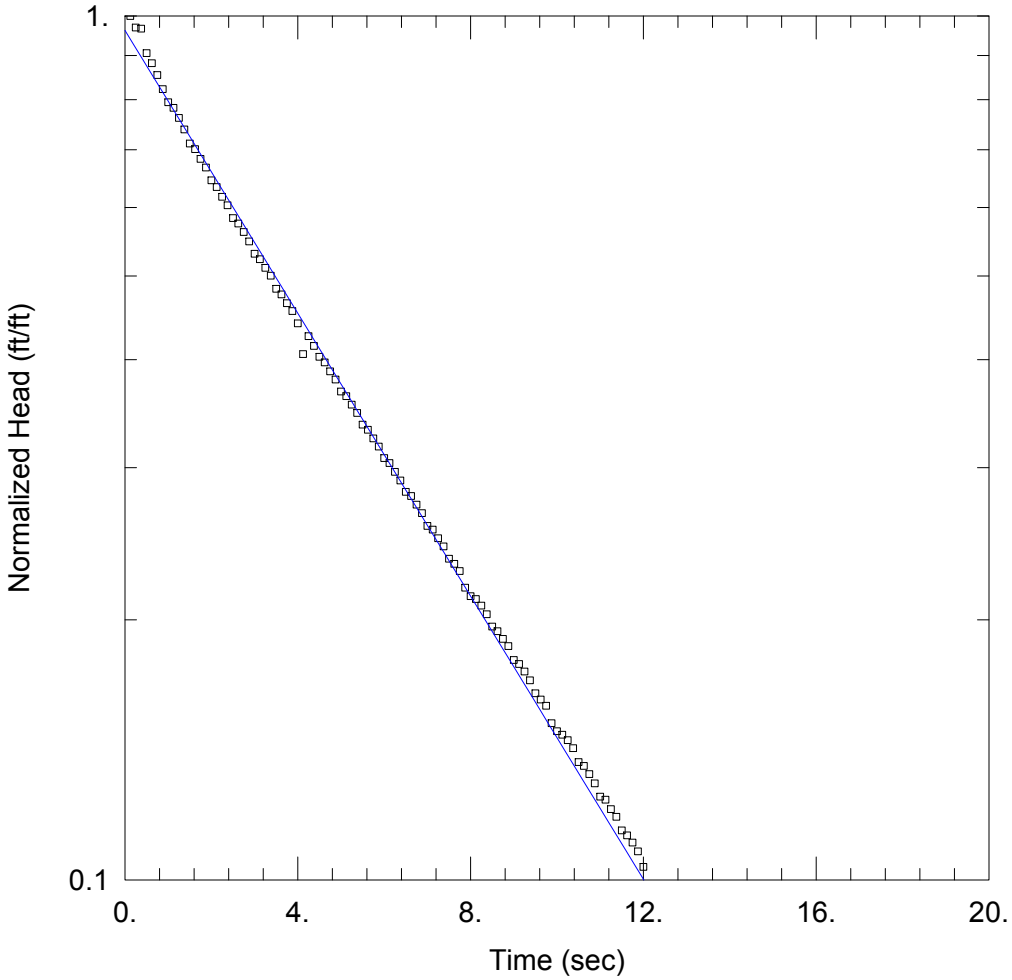
Saturated Thickness: 22.15 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AM16D)

Initial Displacement: -1.875 ft Static Water Column Height: 22.15 ft
Total Well Penetration Depth: 30. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.007927 cm/sec y0 = -1.807 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-AM16D_3.aqt
Date: 02/05/19 Time: 11:37:00

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-AM16D
Test Date: 04/10/2018

AQUIFER DATA

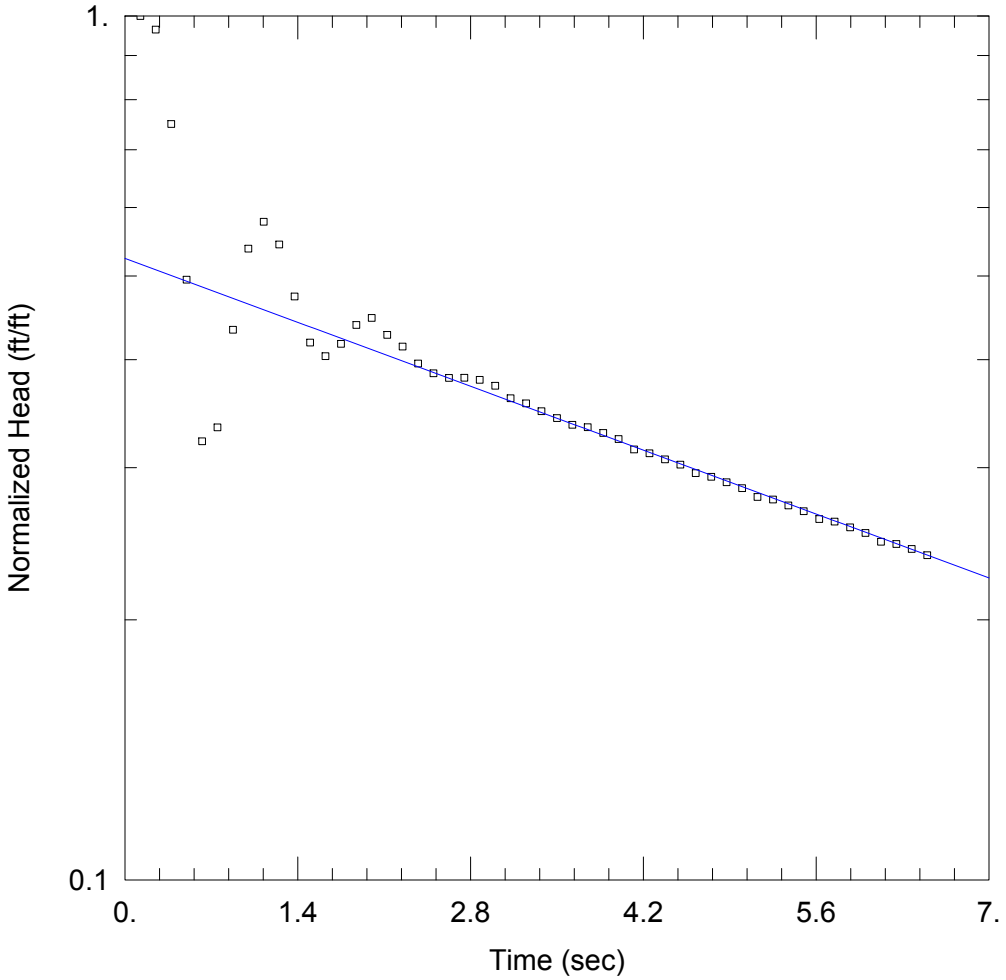
Saturated Thickness: 22.15 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-AM16D)

Initial Displacement: -1.931 ft Static Water Column Height: 22.15 ft
Total Well Penetration Depth: 30. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.007621 cm/sec y0 = -1.857 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-Y9_1.aqt
Date: 02/06/19 Time: 14:05:42

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-Y9
Test Date: 04/10/2018

AQUIFER DATA

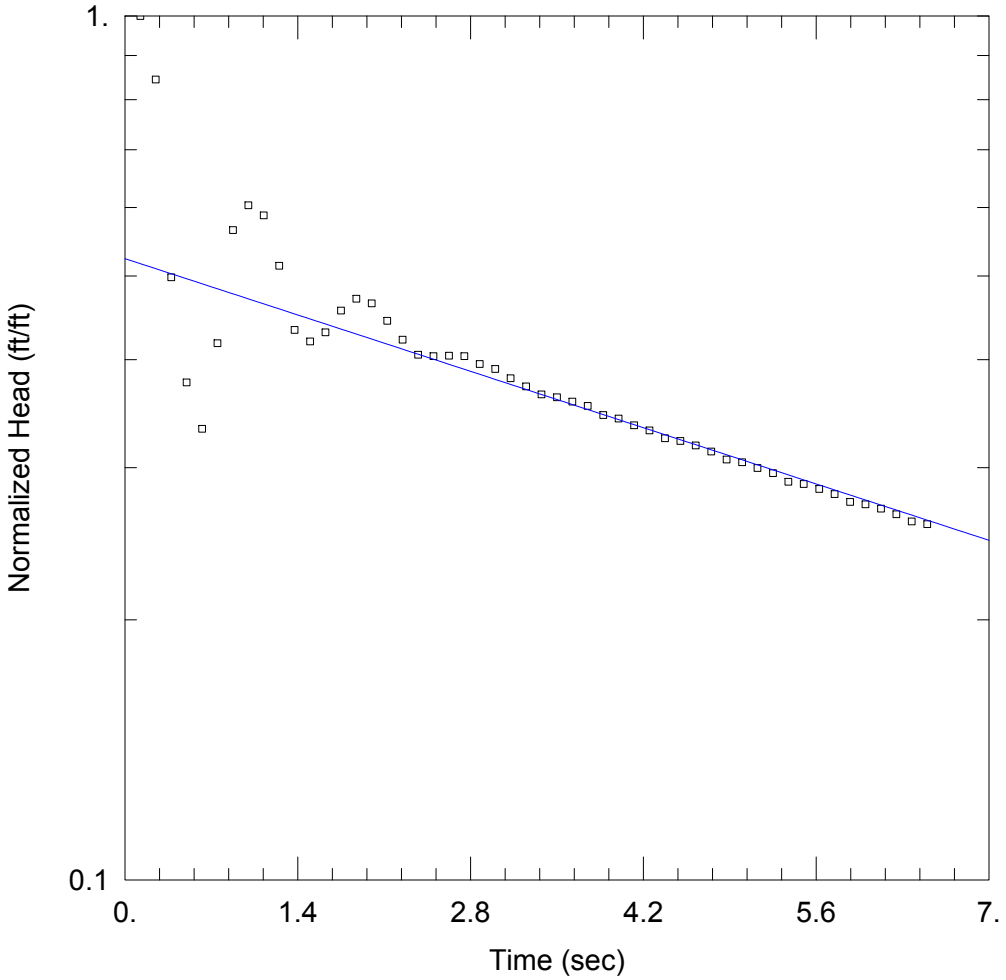
Saturated Thickness: 5.19 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-Y9)

Initial Displacement: -1.653 ft Static Water Column Height: 5.19 ft
Total Well Penetration Depth: 6.5 ft Screen Length: 4.5 ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 0.007737 cm/sec y0 = -0.8661 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-Y9_2.aqt
Date: 02/06/19 Time: 14:14:01

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-Y9
Test Date: 04/10/2018

AQUIFER DATA

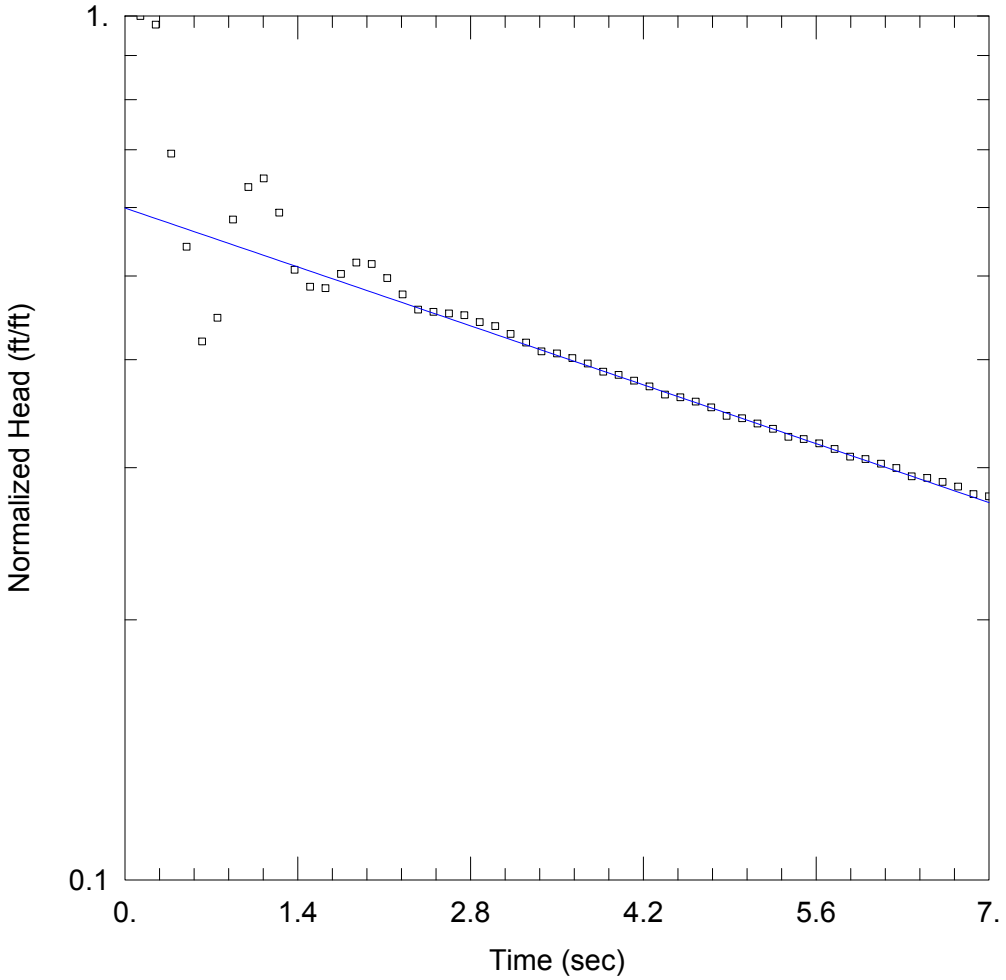
Saturated Thickness: 5.19 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-Y9)

Initial Displacement: -1.617 ft Static Water Column Height: 5.19 ft
Total Well Penetration Depth: 6.5 ft Screen Length: 4.5 ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 0.006821 cm/sec y0 = -0.847 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-Y9_3.aqt
Date: 02/06/19 Time: 14:15:07

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-Y9
Test Date: 04/10/2018

AQUIFER DATA

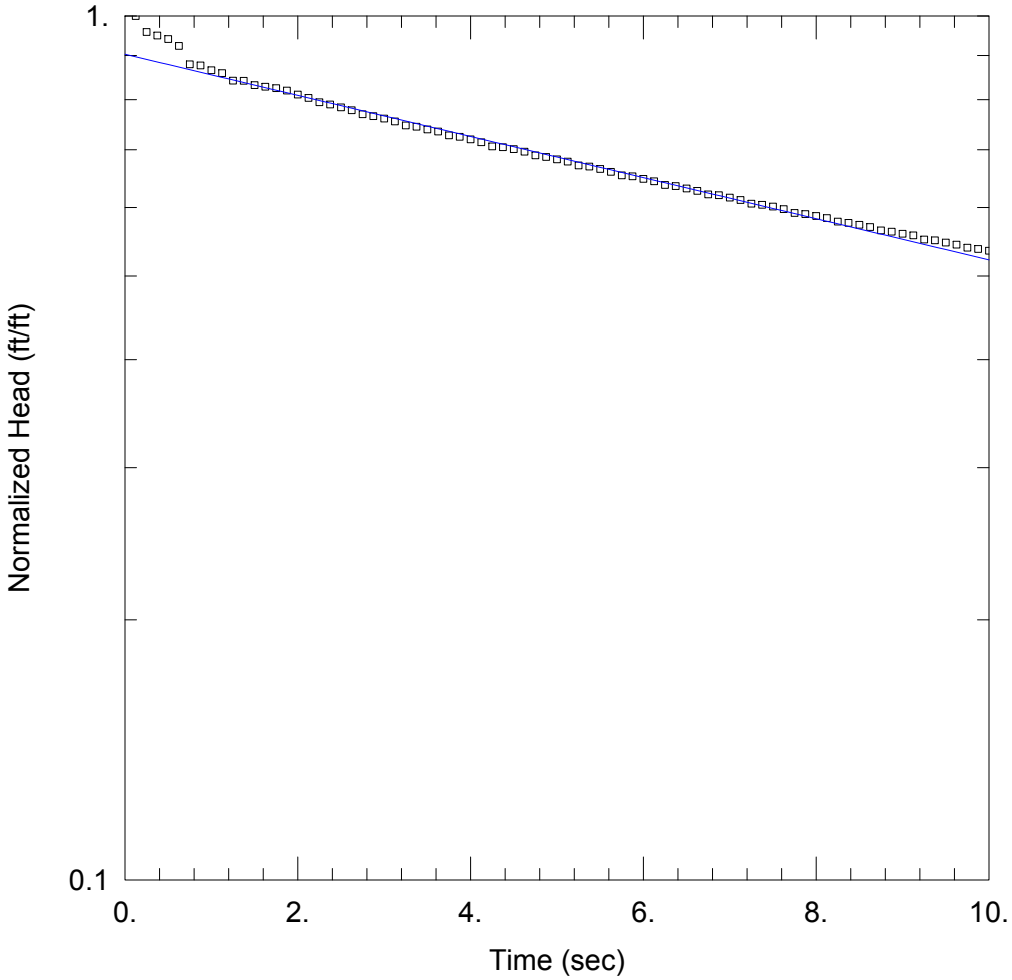
Saturated Thickness: 5.19 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-Y9)

Initial Displacement: -1.521 ft Static Water Column Height: 5.19 ft
Total Well Penetration Depth: 6.5 ft Screen Length: 4.5 ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 0.007133 cm/sec y0 = -0.9112 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-Y9D_1.aqt
Date: 02/05/19 Time: 11:39:12

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-Y9D
Test Date: 04/10/2018

AQUIFER DATA

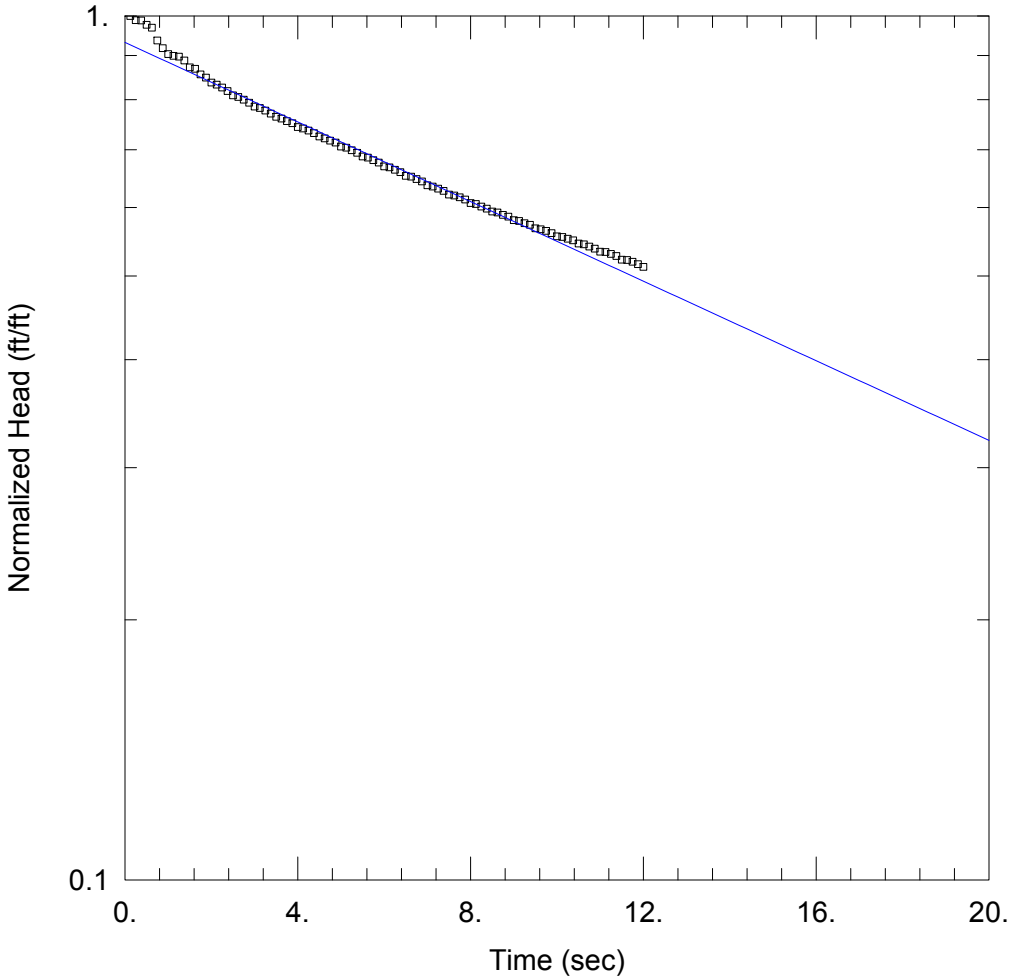
Saturated Thickness: 25.31 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-Y9D)

Initial Displacement: -1.727 ft Static Water Column Height: 25.31 ft
Total Well Penetration Depth: 32. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.002237 cm/sec y0 = -1.559 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-Y9D_2.aqt
Date: 02/05/19 Time: 11:51:57

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-Y9D
Test Date: 04/10/2018

AQUIFER DATA

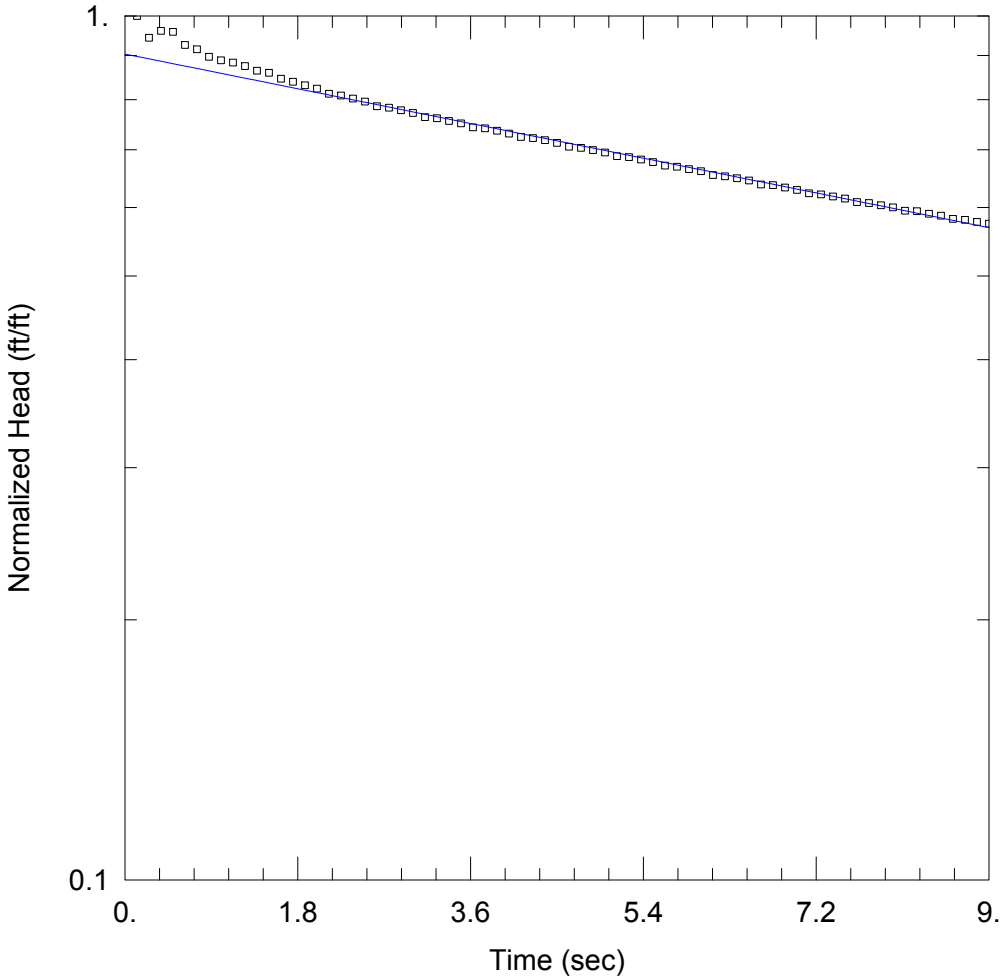
Saturated Thickness: 25.31 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-Y9D)

Initial Displacement: -1.671 ft Static Water Column Height: 25.31 ft
Total Well Penetration Depth: 32. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.002166 cm/sec y0 = -1.557 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-Y9D_3.aqt
Date: 02/05/19 Time: 11:53:10

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-Y9D
Test Date: 04/10/2018

AQUIFER DATA

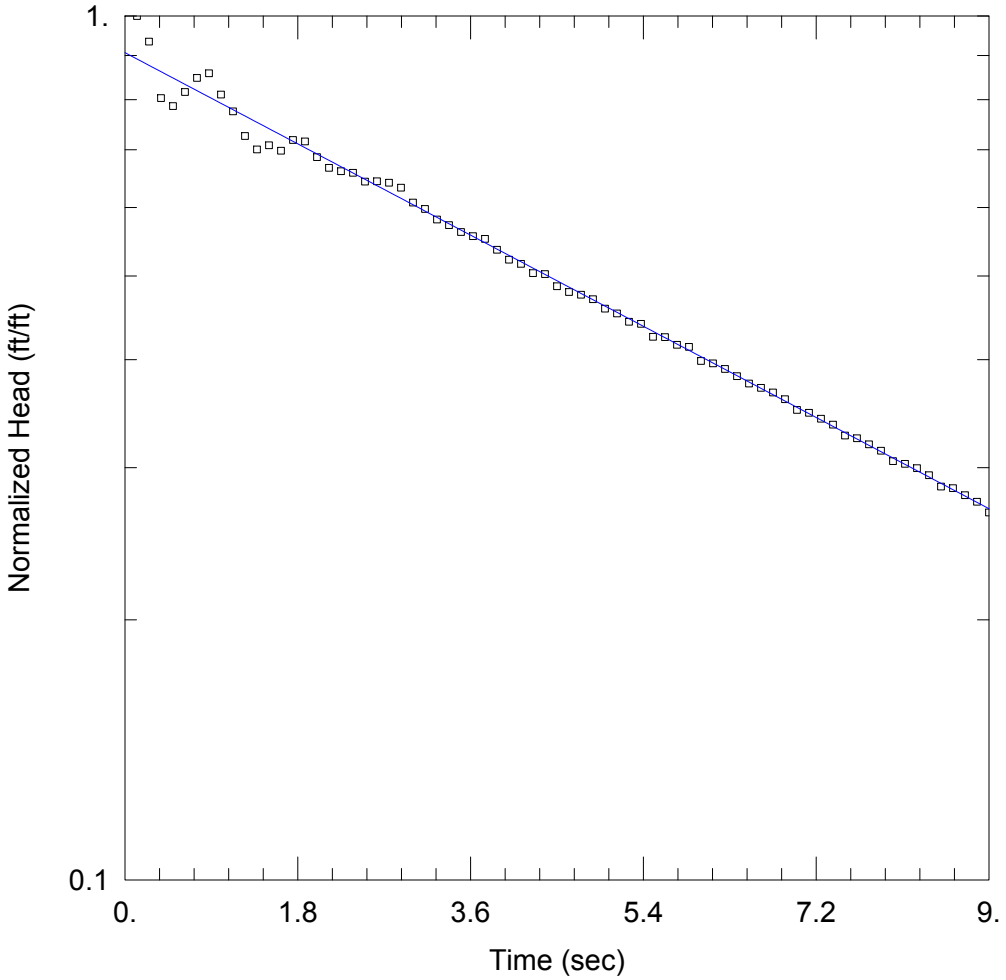
Saturated Thickness: 25.31 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-Y9D)

Initial Displacement: -1.73 ft Static Water Column Height: 25.31 ft
Total Well Penetration Depth: 32. ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.002099 cm/sec y0 = -1.563 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-Y15_1.aqt
Date: 02/06/19 Time: 13:30:03

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-Y15
Test Date: 04/10/2018

AQUIFER DATA

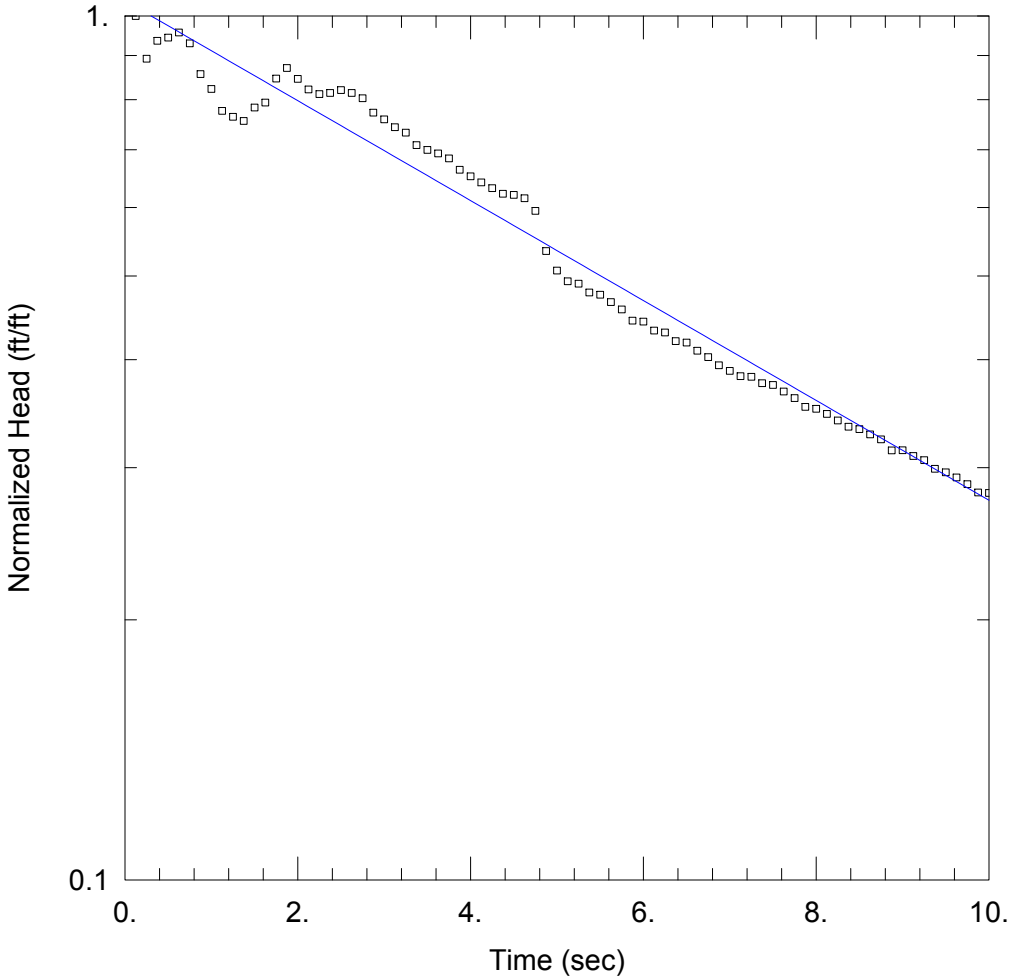
Saturated Thickness: 2.18 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-Y15)

Initial Displacement: -0.9464 ft Static Water Column Height: 2.18 ft
Total Well Penetration Depth: 13.5 ft Screen Length: 8.5 ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 0.005552 cm/sec y0 = -0.8581 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-Y15_2.aqt
Date: 02/06/19 Time: 13:55:14

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-Y15
Test Date: 04/10/2018

AQUIFER DATA

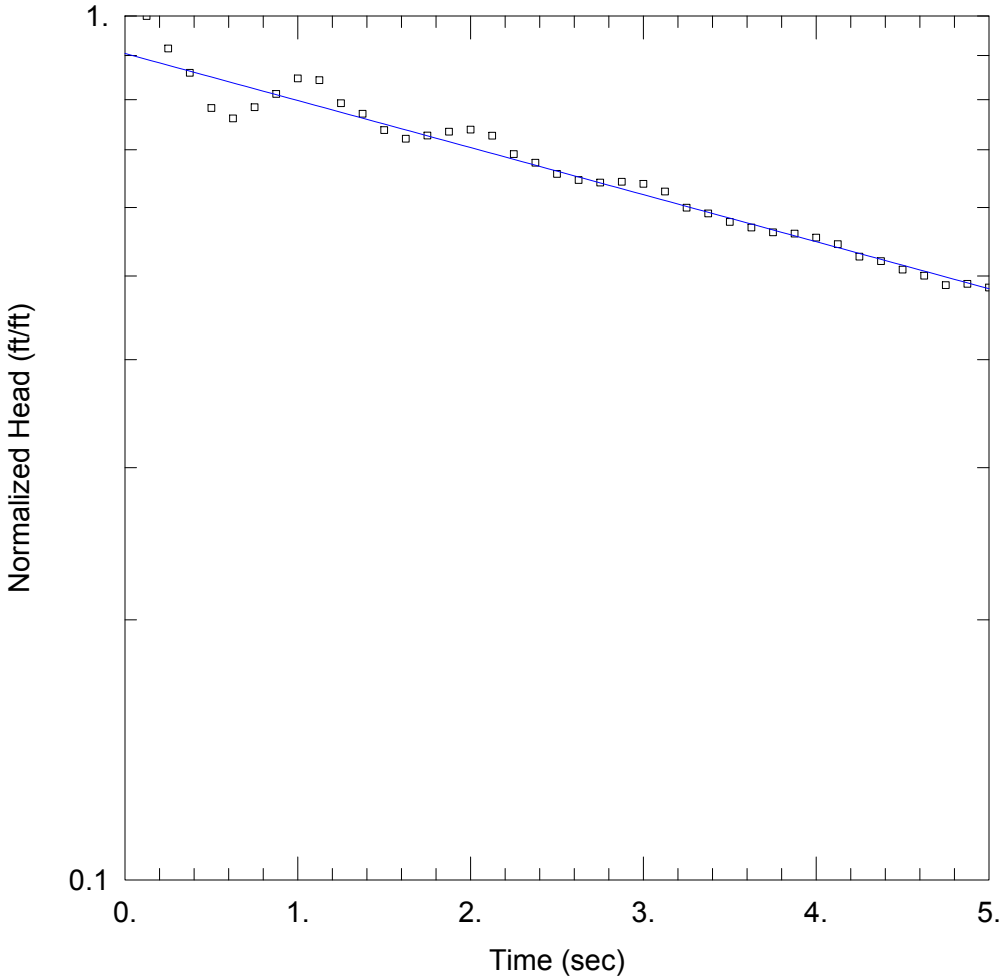
Saturated Thickness: 2.18 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-Y15)

Initial Displacement: -0.8646 ft Static Water Column Height: 2.18 ft
Total Well Penetration Depth: 13.5 ft Screen Length: 8.5 ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 0.005473 cm/sec y0 = -0.9001 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-Y15_3.aqt
Date: 02/06/19 Time: 13:56:38

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-Y15
Test Date: 04/10/2018

AQUIFER DATA

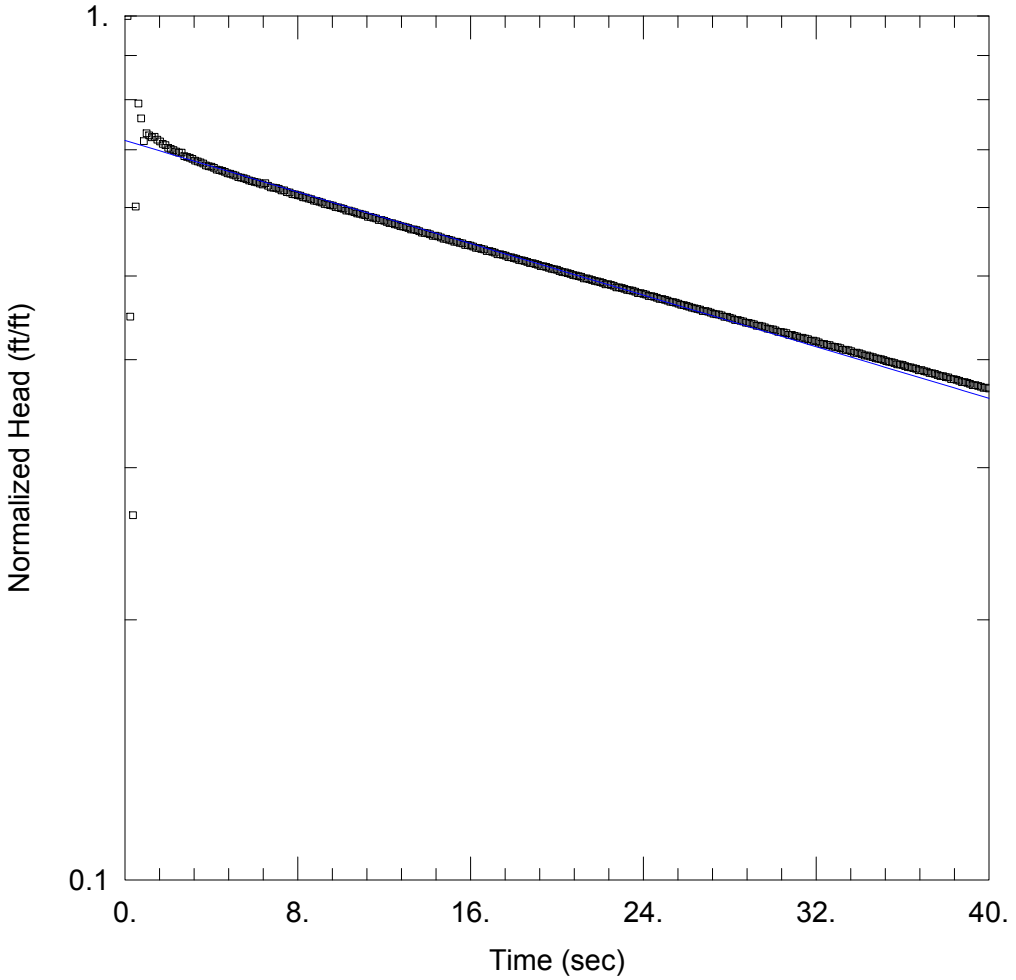
Saturated Thickness: 2.18 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-Y15)

Initial Displacement: -0.8944 ft Static Water Column Height: 2.18 ft
Total Well Penetration Depth: 13.5 ft Screen Length: 8.5 ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 0.005155 cm/sec y0 = -0.8091 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-Y15D_1.aqt
Date: 02/05/19 Time: 11:56:48

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-Y15D
Test Date: 04/10/2018

AQUIFER DATA

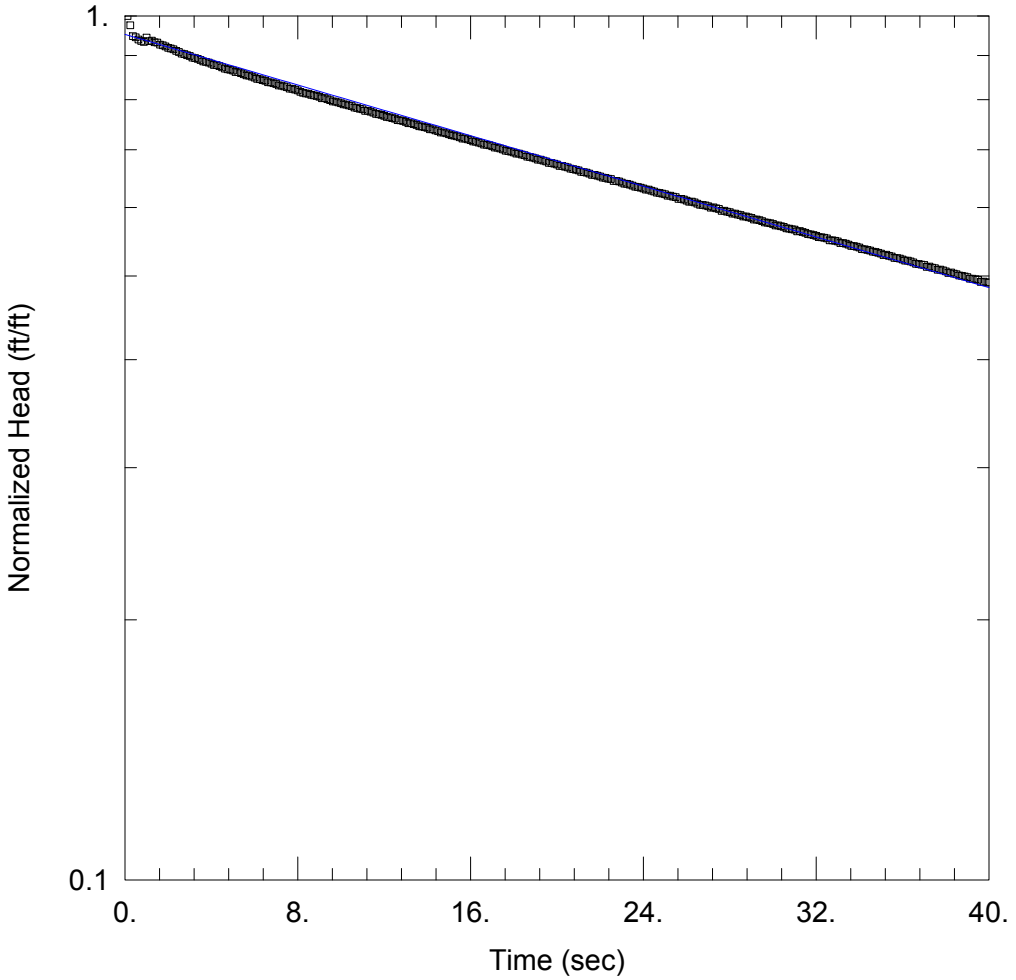
Saturated Thickness: 33.6 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-Y15D)

Initial Displacement: -2.953 ft Static Water Column Height: 33.6 ft
Total Well Penetration Depth: 40. ft Screen Length: 5. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.001365 cm/sec y0 = -2.119 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-Y15D_2.aqt
Date: 02/05/19 Time: 11:57:54

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-Y15D
Test Date: 04/10/2018

AQUIFER DATA

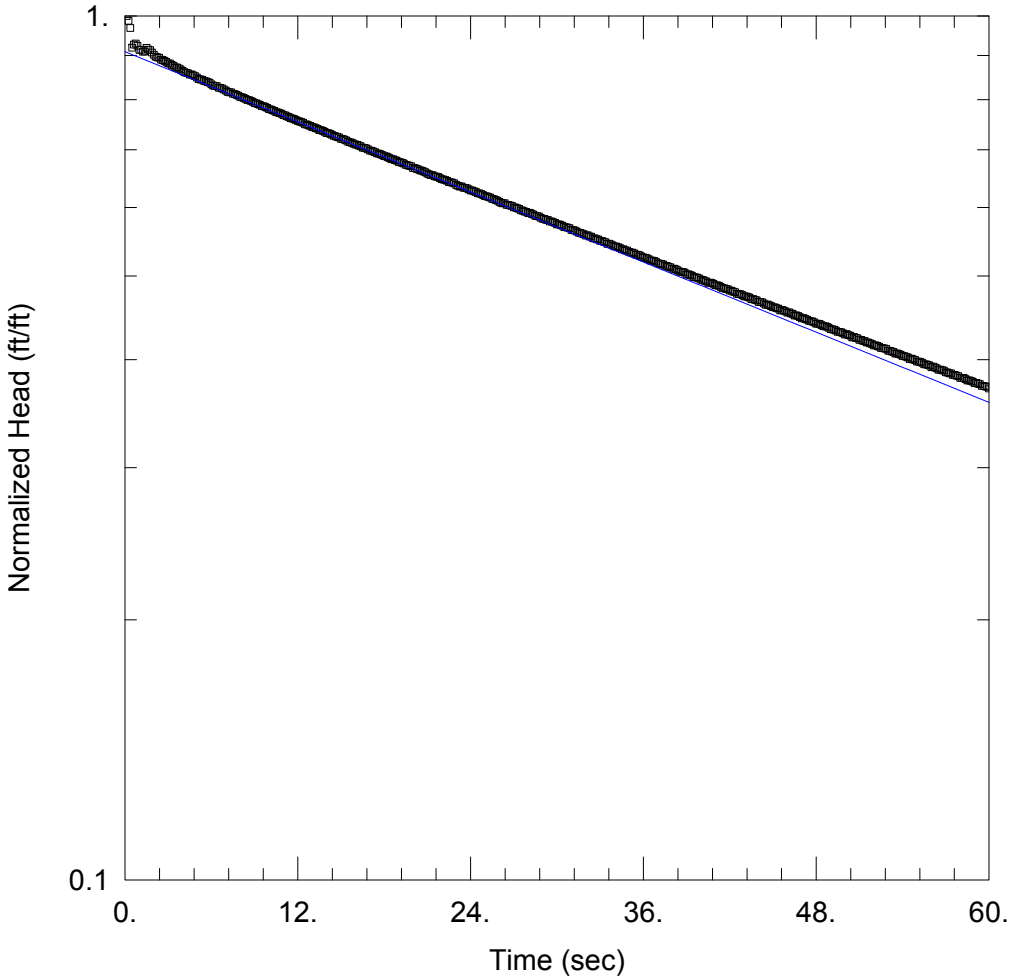
Saturated Thickness: 33.6 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-Y15D)

Initial Displacement: -2.187 ft Static Water Column Height: 33.6 ft
Total Well Penetration Depth: 40. ft Screen Length: 5. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.001341 cm/sec y0 = -2.082 ft



WELL TEST ANALYSIS

Data Set: X:\...\MW-Y15D_3.aqt
Date: 02/05/19 Time: 11:59:26

PROJECT INFORMATION

Company: AECOM
Client: Town of Greenwich
Project: 60432356
Location: Greenwich, Connecticut
Test Well: MW-Y15D
Test Date: 04/10/2018

AQUIFER DATA

Saturated Thickness: 33.6 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-Y15D)

Initial Displacement: -2.304 ft Static Water Column Height: 33.6 ft
Total Well Penetration Depth: 40. ft Screen Length: 5. ft
Casing Radius: 0.08333 ft Well Radius: 0.1667 ft

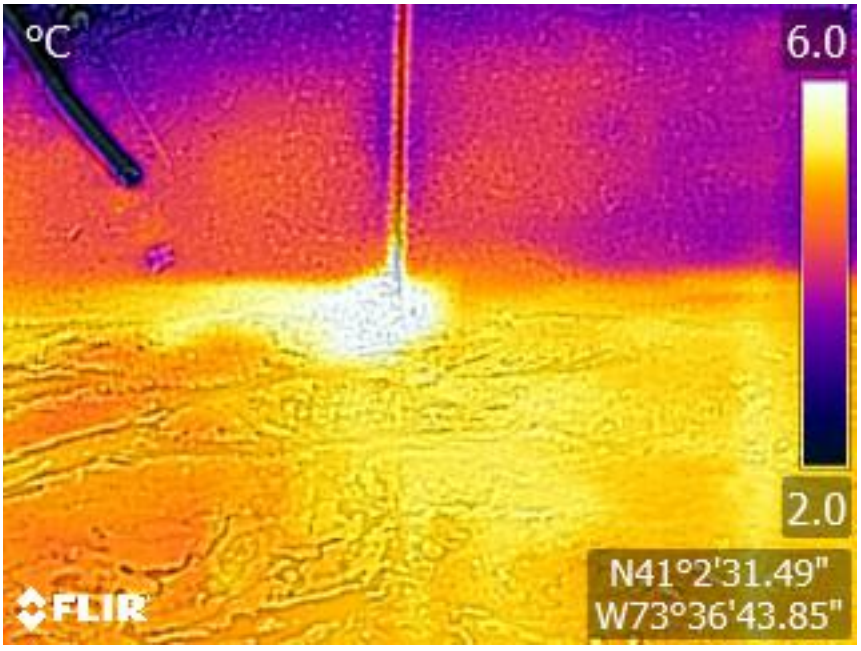
SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.001238 cm/sec y0 = -2.094 ft

Appendix H

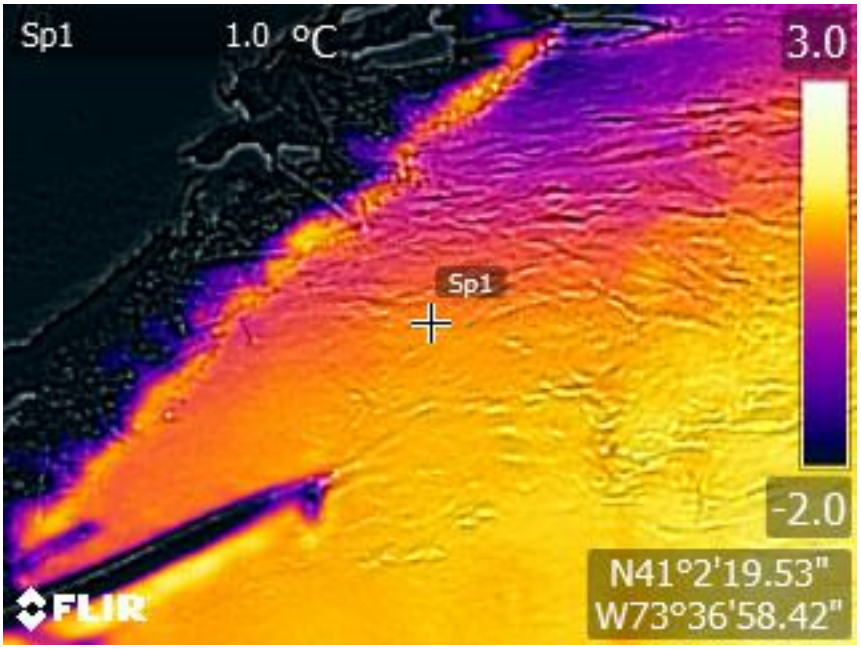
Location - 01

Thermal Anomaly – Crack between Concrete Channel



Location – B

Thermal Anomaly – Along Concrete Bank



Appendix I

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 17D0505
Date Samples Collected: 4/11/2017 and 4/12/2017
Number of Samples Collected: 11
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	4.7°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	Continuing calibration did not meet method specifications and was biased on the high side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the high side. Analyte and samples affected: Monochlorobiphenyls B174664-BS1, B174664-BSD1, B174664-MS1, B174664-MSD1 Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected

		since sample result was "not detected" for this compound. Analyte and samples affected: Monochlorobiphenyls 17D0505-01[MW-28-20170411-1], 17D0505-05[MW-35-20170411-1], 17D0505-06[MW-BB34-20170412-1], 17D0505-07[MW-V12-20170412-1], 17D0505-08[MW-AP28-20170412-1], 17D0505-09[MW-AG30-20170412-1], B174664-BLK1
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data	Meets criteria.
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate. Surrogate outside of control limits. Analyte and sample affected: Tetrachloro-m-xylene B174664-BSD1
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 17D0656
Date Samples Collected: 4/12/2017 and 4/13/2017
Number of Samples Collected: 11
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	2.1, 3.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	No issues narrated.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data	Meets criteria.
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group

	laboratory established limits.	results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY02577
Date Samples Collected: 4/10/2017 and 4/11/2017
Number of Samples Collected: 6
Analysis: SW846 6010C
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	3.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BY02577; MW-S15-20170410-1 and BY02578; MW-S15-20170410-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY02577
Date Samples Collected: 4/10/2017 and 4/11/2017
Number of Samples Collected: 6
Analysis: SW846 6020B
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days Mercury 28 days	3.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BY02577; MW-S15-20170410-1 and BY02578; MW-S15-20170410-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV, CCV ±10% of true value	No issues narrated.

Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control (95% confidence limits) for solids	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY02577
Date Samples Collected: 4/10/2017 and 4/11/2017
Number of Samples Collected: 6
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	3.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BY02577; MW-S15-20170410-1 and BY02578; MW-S15-20170410-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Meets criteria.
Quantitation Limits	Dilutions	"No dilutions" or "Meets Criteria" or list any issues
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY02577
Date Samples Collected: 4/10/2017 and 4/11/2017
Number of Samples Collected: 6
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BY02579; MW-P7-20170411-1 and BY02580; MW-P7-20170411-2: Meets criteria.
Method Blank	< RLs	QC Batch 382483 (Samples: BY02577, BY02579, BY02580, BY02581, BY02582, BY02583): A trace amount of an analyte was found in blank but were not reported in the sample(s), therefore no bias is suspected. (Chrysene)
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	No issues narrated.

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY03251
Date Samples Collected: 4/11/2017 and 4/12/2017
Number of Samples Collected: 5
Analysis: SW846 6010C
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	3.2°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY03251
Date Samples Collected: 4/11/2017 and 4/12/2017
Number of Samples Collected: 5
Analysis: SW846 6020B
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days Mercury 28 days	3.2°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV, CCV ±10% of true value	No issues narrated.

Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control (95% confidence limits) for solids	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY03251
Date Samples Collected: 4/11/2017 and 4/12/2017
Number of Samples Collected: 5
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	3.2°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY03251
Date Samples Collected: 4/11/2017 and 4/12/2017
Number of Samples Collected: 5
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.2°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	No issues narrated.

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Surrogates	Percent recovery 30-130%	QC Batch 382746 (Samples: BY03251, BY03252, BY03253, BY03254, BY03255): The MS/MSD RPD exceeds the method criteria for one or more surrogates. Both recoveries are within limits. No significant bias is suspected. (% Terphenyl-d14)
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	QC Batch 382746 (Samples: BY03251, BY03252, BY03253, BY03254, BY03255): The MS/MSD RPD exceeds the method criteria for one or more analytes, therefore there may be variability in the reported result. (Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene)
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 17D0409
Date Samples Collected: 4/10/2017 and 4/11/2017
Number of Samples Collected: 9
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.2, 2.3°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	17D0409-01; MW-S15-20170410-1 and 17D0409-02; MW-S15-20170410-2: RPD for Dichlorobiphenyls >30%. Sample results for Dichlorobiphenyls considered to be estimated. 17D0409-08; MW-AG10-20170411-1 and 17D0409-09; MW-AG10-20170411-2: RPD for Dichlorobiphenyls and Trichlorobiphenyls >30%. Samples results for Dichlorobiphenyls and Trichlorobiphenyls are considered to be estimated.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	Continuing calibration did not meet method specifications and was biased on the high side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the high side. Affected analyte and samples:

		Monochlorobiphenyls B174664-BS1, B174664-BSD1 Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound. Affected analyte and samples: Monochlorobiphenyls 17D0409-01[MW-515-20170410-1], 17D0409-02[MW-515-20170410-2], 17D0409-03[MW-X17-20170410-1], 17D0409-04[MW-P11-20170411-1], 17D0409-05[MW-P7-20170411-1], 17D0409-06[MW-AE8, 20170411-1], B174664-BLK1
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data	Meets criteria.
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate. B174664-BSD1: Surrogate outside of control limits (Tetrachloro-m-xylene).
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	MS/MSD not analyzed in this data set.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 17H0897
Date Samples Collected: 8/15/2017 and 8/16/2017
Number of Samples Collected: 10
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	5.1, 4.8°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	17H0897-04; MW-S15-081517-1 and 17H0897-05; MW-515-081517-2: RPD for Tetrachlorobiphenyls and Pentachlorobiphenyls >30%. Sample results for Tetrachlorobiphenyls and Pentachlorobiphenyls considered to be estimated.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	No issues narrated.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data	Meets criteria.

Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 17H1062
Date Samples Collected: 8/16/2017 and 8/17/2017
Number of Samples Collected: 15
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.8, 4.1, 3.2, 4.8°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	17H1062-02; MW-R20-081617-1 and 17H1062-03; MW-R20-081617-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	Continuing calibration did not meet method specifications and was biased on the high side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the high side. Affected analyte and samples: Decachlorobiphenyl B184765-BS1, B184765-BSD1, B184765-MS1, B184765-MSD1 Pentachlorobiphenyls B184765-BS1, B184765-BSD1, B184765-MS1, B184765-MSD1

		Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound. Affected analyte and samples: Decachlorobiphenyl 17H1062-01[MW-L25-081617-1], 17H1062-02[MW-R20-081617-1], 17H1062-03[MW-R20-081617-2], 17H1062-04[MW-Y26-081617-1], 17H1062-05[MW-AP28-081717-1], 17H1062-06[MW-BB34-081717-1], 17H1062-07[MW-AG30-081717-1], 17H1062-08[MW-F35-081717-1], 17H1062-09[MW-AJ19-081717-1], 17H1062-10[MW-X17-081717-1], 17H1062-11[MW-V18-081717-1], 17H1062-12[MW-AA19-081817-1], 17H1062-13[MW-AV17-081817-1], 17H1062-14[MW-AM21-081817-1], 17H1062-15[MW-T23-081817-1], B184765-BLK1 Monochlorobiphenyls 17H1062-08[MW-F35-081717-1], 17H1062-09[MW-AJ19-081717-1], 17H1062-10[MW-X17-081717-1], 17H1062-11[MW-V18-081717-1], 17H1062-12[MW-AA19-081817-1], 17H1062-13[MW-AV17-081817-1], 17H1062-14[MW-AM21-081817-1], 17H1062-15[MW-T23-081817-1] Pentachlorobiphenyls 17H1062-01[MW-L25-081617-1], 17H1062-02[MW-R20-081617-1], 17H1062-03[MW-R20-081617-2], 17H1062-04[MW-Y26-081617-1], 17H1062-05[MW-AP28-081717-1], 17H1062-06[MW-BB34-081717-1], 17H1062-07[MW-AG30-081717-1], 17H1062-08[MW-F35-081717-1], 17H1062-09[MW-AJ19-081717-1], 17H1062-10[MW-X17-081717-1], 17H1062-11[MW-V18-081717-1], 17H1062-12[MW-AA19-081817-1], 17H1062-13[MW-AV17-081817-1], 17H1062-14[MW-AM21-081817-1], 17H1062-15[MW-T23-081817-1], B184765-BLK1
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data	Meets criteria.
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 17H1571
Date Samples Collected: 8/24/2017 and 8/29/2017
Number of Samples Collected: 11
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.3, 3.6, 4.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	No issues narrated.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data	Meets criteria.
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group

	laboratory established limits.	results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	MS/MSD not analyzed in this data set.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY85227
Date Samples Collected: 8/15/2017 and 8/16/2017
Number of Samples Collected: 7
Analysis: SW846 6010C
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	4.3°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BY85228; MW-S15-081517-1 and BY85229; MW-S15-081517-2: RPD for Nickel >50%. Sample results for Nickel considered to be estimated.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY85227
Date Samples Collected: 8/15/2017 and 8/16/2017
Number of Samples Collected: 7
Analysis: SM3113B/SW7010-04
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	4.3°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BY85228; MW-S15-081517-1 and BY85229; MW-S15-081517-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY85227
Date Samples Collected: 8/15/2017 and 8/16/2017
Number of Samples Collected: 7
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	4.3°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BY85228; MW-S15-081517-1 and BY85229; MW-S15-081517-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY85227
Date Samples Collected: 8/15/2017 and 8/16/2017
Number of Samples Collected: 7
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	4.3°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BY85228; MW-S15-081517-1 and BY85229; MW-S15-081517-2:
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	CCV (CHEM07/0821_02-SIM_0817): The following compounds did not meet % deviation criteria: Dibenz(a,h)anthracene 38% (30%).

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY92749
Date Samples Collected: 8/24/2017 and 8/29/2017
Number of Samples Collected: 4
Analysis: SW846 6010C
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	3.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY92749
Date Samples Collected: 8/24/2017 and 8/29/2017
Number of Samples Collected: 4
Analysis: SM3113B/SW7010-04
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	3.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY92749
Date Samples Collected: 8/24/2017 and 8/29/2017
Number of Samples Collected: 4
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	3.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBY92749
Date Samples Collected: 8/24/2017 and 8/29/2017
Number of Samples Collected: 4
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	No issues narrated.

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 17K0813
Date Samples Collected: 11/14/2017
Number of Samples Collected: 12
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	2.8°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	No issues narrated.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data	Meets criteria.
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group

	laboratory established limits.	results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	MS/MSD not analyzed in this data set.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 17K0912
Date Samples Collected: 11/15/2017
Number of Samples Collected: 10
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	2.8, 2.9°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	17K0912-05; MW-S15-111517-1 and 17K0912-06; MW-S15-111517-2: RPD for Monochlorobiphenyls >30%. Sample results for Monochlorobiphenyls considered to be estimated.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	No issues narrated.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data	Meets criteria.
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group

	laboratory established limits.	results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 17K1027
Date Samples Collected: 11/16/2017
Number of Samples Collected: 13
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.7, 3.8°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	17K1027-07; MW-R20-111617-1 and 17K1027-08; MW-R20-111617-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	No issues narrated.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data	Meets criteria.
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group

	laboratory established limits.	results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ41605
Date Samples Collected: 11/14/2017
Number of Samples Collected: 4
Analysis: SW846 6010C
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	3.6°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	BZ41608; MW-AJ13-111417-1: Sample result for Zinc from 10x dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ41605
Date Samples Collected: 11/14/2017
Number of Samples Collected: 4
Analysis: SM3113B/SW7010-04
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	3.6°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ41605
Date Samples Collected: 11/14/2017
Number of Samples Collected: 4
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	3.6°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ41605
Date Samples Collected: 11/14/2017
Number of Samples Collected: 4
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.6°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	Initial Calibration Verification (CHEM04/SIM_1113): The following compounds had %RSDs >20%: Chrysene 23% (20%).

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	BZ4029: All LCS/LCSD RPDs were less than 20% with the following exceptions: Indeno(1,2,3-cd)pyrene(33.1%); OK, all sample results ND.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	MS/MSD not analyzed in this data set.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ42340
Date Samples Collected: 11/15/2018
Number of Samples Collected: 5
Analysis: SW846 6010C
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	2.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BZ42342; MW-S15-111517-1 and BZ42343; MW-S15-111517-2: Vanadium RPD > 50%. Sample results for Vanadium considered to be estimated.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ42340
Date Samples Collected: 11/15/2017
Number of Samples Collected: 5
Analysis: SM3113B/SW7010-04
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	2.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BZ42342; MW-S15-111517-1 and BZ42343; MW-S15-111517-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ42340
Date Samples Collected: 11/15/2017
Number of Samples Collected: 5
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	2.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BZ42342; MW-S15-111517-1 and BZ42343; MW-S15-111517-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ42340
Date Samples Collected: 11/15/2017
Number of Samples Collected: 5
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	2.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BZ42342; MW-S15-111517-1 and BZ42343; MW-S15-111517-2: Meets criteria.
Method Blank	< RLs	QC Batch 410120; BZ42340, BZ42341, BZ42342, BZ42343: A trace amount of an analyte was found in blank but were not reported in the sample(s), therefore no bias is suspected. (Acenaphthylene) A trace amount of an analyte was found in blank. Due to the concentration in the blank relative to the samples, no bias is suspected. (Acenaphthene(BZ42340)) Analyte was found in blank. A high bias is suspected. (2-Methylnaphthalene(BZ42340), Fluorene(BZ42340), Naphthalene(BZ42340), Phenanthrene(BZ42340))

Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	CHEM04/SIM_1113: The following compounds had %RSDs >20%: Chrysene 23% (20%)
Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	QC Batch 410120; BZ42340, BZ42341, BZ42342, BZ42343: The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (Indeno(1,2,3-cd)pyrene)
Surrogates	Percent recovery 30-130%	QC Batch 410107; BZ42344: One or more surrogates is outside of criteria. (% Terphenyl-d14) The LCS/LCSD RPD exceeds the method criteria for one or more surrogates, therefore there may be variability in the reported result. (% 2-Fluorobiphenyl, % Nitrobenzene-d5, % Terphenyl-d14) The MS/MSD RPD exceeds the method criteria for one or more surrogates, therefore there may be variability in the reported result. (% Nitrobenzene-d5)
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	QC Batch 410107; BZ42344: The LCS/LCSD recovery is acceptable. One or more analytes in the site specific matrix spike recovery is below the method criteria, therefore a low bias is likely. (Acenaphthylene, Benzo(a)pyrene) The MS/MSD RPD exceeds the method criteria for one or more analytes, therefore there may be variability in the reported result. (Benzo(a)pyrene, Pyrene)
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ43600
Date Samples Collected: 11/16/2017
Number of Samples Collected: 1
Analysis: SW846 6010C
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	4.6°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ43600
Date Samples Collected: 11/16/2017
Number of Samples Collected: 1
Analysis: SM3113B/SW7010-04
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	4.6°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ43600
Date Samples Collected: 11/16/2017
Number of Samples Collected: 1
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	4.6°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ43600
Date Samples Collected: 11/16/2017
Number of Samples Collected: 1
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	4.6°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	No issues narrated.

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18C0227
Date Samples Collected: 3/6/2018
Number of Samples Collected: 12
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	4.4, 3.6°C 18C0227-07RE1; MW-S15-030618-1, 18C0227-08RE2; MW-AH16R-030618-1, 18C0227-09RE2; MW-Y15-030618-1: Sample was extracted past the recommended holding time.
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	18C0227-07; MW-S15-030618-1 and 18C0227-12; MW-S15-030618-2: Dichlorobiphenyls and Pentachlorobiphenyls RPD >30%. Sample results for Dichlorobiphenyls and Pentachlorobiphenyls are considered to be estimated.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	No issues narrated.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data	Meets criteria.

Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate. 18C0227-07; MW-S15-030618-1: Sample was re-extracted outside of holding time since surrogate standard recovery was outside of control limits. Data from analysis performed outside of holding time is also reported since surrogate recovery is acceptable. 18C0227-08; MW-AH16R-030618-1: Sample was re-extracted outside of holding time since surrogate standard recovery was outside of control limits in initial analysis. Initial data is reported since confirmation analysis also had unacceptable surrogate, confirming matrix interference. 18C0227-09; MW-Y15-030618-1: Sample was re-extracted outside of holding time since surrogate standard recovery was outside of control limits in initial analysis. Initial data is reported since confirmation analysis also had unacceptable surrogate, confirming matrix interference.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18C0346
Date Samples Collected: 3/6/2018 and 3/8/2018
Number of Samples Collected: 12
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.2, 3.1, 4.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	18C0346-09; MW-R20-030818-1 and 18C0346-10; MW-R20-030818-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	No issues narrated.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data	Meets criteria.
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group

	laboratory established limits.	results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18C0412
Date Samples Collected: 3/8/2018 and 3/9/2018
Number of Samples Collected: 12
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	2.6, 2.8, 2.2°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	No issues narrated.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data	Meets criteria.
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group

	laboratory established limits.	results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	MS/MSD not analyzed in this data set.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ99060
Date Samples Collected: 3/6/2018
Number of Samples Collected: 7
Analysis: SW846 6010C
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	4.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BZ99063; MW-S15-030618-1 and BZ99065; MW-S15-030618-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ99060
Date Samples Collected: 3/6/2018
Number of Samples Collected: 7
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	4.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BZ99063; MW-S15-030618-1 and BZ99065; MW-S15-030618-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ99060
Date Samples Collected: 3/6/2018
Number of Samples Collected: 7
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	4.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	BZ99063; MW-S15-030618-1 and BZ99065; MW-S15-030618-2: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	No issues narrated.

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	QC Batch 421940 (Samples: BZ99060, BZ99061, BZ99062, BZ99063, BZ99064, BZ99065, BZ99066): The LCS/LCSD recovery is acceptable. One or more analytes in the site specific matrix spike recovery is below the method criteria, therefore a low bias is likely. (Benzo(ghi)perylene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene) The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (Acenaphthylene, Benz(a)anthracene, Benzo(a)pyrene, Benzo(ghi)perylene, Indeno(1,2,3-cd)pyrene, Pyrene) The LCS/LCSD RPD exceeds the method criteria for one or more surrogates. Both recoveries are within limits. No significant bias is suspected. (% Nitrobenzene-d5)
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ99948
Date Samples Collected: 3/6/2018
Number of Samples Collected: 2
Analysis: SW846 6010C
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	3.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ99948
Date Samples Collected: 3/6/2018
Number of Samples Collected: 2
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	3.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	MS/MSD not analyzed in this data set.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GBZ99948
Date Samples Collected: 3/6/2018
Number of Samples Collected: 2
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.4°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	The following Initial Calibration compounds did not meet RSD% criteria: Benzo(ghi)perylene 23% (20%).

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	MS/MSD not analyzed in this data set.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA00510
Date Samples Collected: 3/8/2018
Number of Samples Collected: 2
Analysis: SW846 6010C
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	3.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA00510
Date Samples Collected: 3/8/2018
Number of Samples Collected: 2
Analysis: SW846 6020B
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days Mercury 28 days	3.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV, CCV ±10% of true value	No issues narrated.

Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control (95% confidence limits) for solids	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	CA00510; MW-AE8-030818-1: Sample diluted 2x. CA00511; MW-AA12-030818-1: Sample diluted 2x.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA00510
Date Samples Collected: 3/8/2018
Number of Samples Collected: 2
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	3.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA00510
Date Samples Collected: 3/8/2018
Number of Samples Collected: 2
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for evaluating site-wide groundwater conditions. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	None taken.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	CA00510, CA00511: The following compounds had %RSDs >20%: Benzo(ghi)perylene 23% (20%).

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	MS/MSD not analyzed in this data set.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18F1321
Date Samples Collected: 6/26/2018
Number of Samples Collected: 6
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	2.3°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	Field duplicate not included in this sample set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	Continuing calibration did not meet method specifications and was biased on the low side for this compound. Reported result is estimated. Analyte & Samples(s) Qualified: Octachlorobiphenyls S024974-CCV2
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data; Percent recovery meets laboratory established limits.	Meets criteria.

Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	MS/MSD not included in this sample set.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18F1383
Date Samples Collected: 6/27/2018
Number of Samples Collected: 2
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	2.5°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	Field duplicate not included in this sample set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	No issues narrated.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data; Percent recovery meets laboratory established limits.	Meets criteria.

Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	MS/MSD not included in this sample set.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18F1384
Date Samples Collected: 6/27/2018
Number of Samples Collected: 9
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	2.8°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	Field duplicate not included in this sample set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	Continuing calibration did not meet method specifications and was biased on the low side for this compound. Reported result is estimated. Analyte & Samples(s) Qualified: Octachlorobiphenyls 18F1384-05[MW-AJB-062718-1], 18F1384-07[MW-AJBD-067218-1], 18F1384-09[MW-AE8-062718-1], S025035-CCV1, S025035-CCV2 Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected

		since sample result was "not detected" for this compound. Analyte & Samples(s) Qualified: Decachlorobiphenyl S024999-CCV1, S024999-CCV2 Heptachlorobiphenyls S024999-CCV1, S024999-CCV2 Hexachlorobiphenyls S024999-CCV1, S024999-CCV2 Nonachlorobiphenyls S024999-CCV1, S024999-CCV2 Octachlorobiphenyls S024999-CCV2
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data; Percent recovery meets laboratory established limits.	Meets criteria.
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	MS/MSD not included in this sample set.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18F1460
Date Samples Collected: 6/27/2018 & 6/28/2018
Number of Samples Collected: 10
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.5/5.8°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	MW-S15-062818-1; 18F1460-08 and MW-S15-062818-2; 18F1460-09: RPD for Monochlorobiphenyls and Dichlorobiphenyls > 50%. Sample results for these analytes are considered estimated.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	Continuing calibration did not meet method specifications and was biased on the low side for this compound. Reported result is estimated. Analyte & Samples(s) Qualified: Octachlorobiphenyls S024974-CCV2
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data; Percent recovery meets laboratory established	Analyte is found in the associated laboratory blank as well as in the sample. Analyte & Samples(s) Qualified: Monochlorobiphenyls 18F1460-01[MW-V18-062818-1], 18F1460-02[MW-T23-

	limits.	062818-1], 18F1460-03[MW-AH16R-062818-1], 18F1460-04[MW-AM16-062818-1], 18F1460-05[MW-AA12-062718-1], 18F1460-06[MW-P7-062818-1], 18F1460-07[MW-P11-062818-1], 18F1460-09[MW-S15-062818-2], B207059-BLK1, B207059-BS1, B207059-BSD1, B207059-MS1, B207059-MSD1 Total Polychlorinated biphenyls 18F1460-01[MW-V18-062818-1], 18F1460-02[MW-T23-062818-1], 18F1460-03[MW-AH16R-062818-1], 18F1460-04[MW-AM16-062818-1], 18F1460-05[MW-AA12-062718-1], 18F1460-06[MW-P7-062818-1], 18F1460-07[MW-P11-062818-1], 18F1460-08[MW-S15-062818-1], 18F1460-09[MW-S15-062818-2] Data is not affected by elevated level in laboratory blank since sample result is >10x level found in the blank. Analyte & Samples(s) Qualified: Monochlorobiphenyls 18F1460-03[MW-AH16R-062818-1], 18F1460-05[MW-AA12-062718-1]
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18F1461
Date Samples Collected: 6/28/2018
Number of Samples Collected: 2
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	2.3°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	MW-R20-062818-1; 18F1461-01 and MW-R20-062818-2; 18F1461-02: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	Continuing calibration did not meet method specifications and was biased on the low side for this compound. Reported result is estimated. Analyte & Samples(s) Qualified: Octachlorobiphenyls S024974-CCV2
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data; Percent recovery meets laboratory established limits.	Analyte is found in the associated laboratory blank as well as in the sample. Analyte & Samples(s) Qualified: Monochlorobiphenyls B207059-BLK1, B207059-BS1, B207059-BSD1

Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	MS/MSD not analyzed in this data set.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18G0022
Date Samples Collected: 6/29/2018
Number of Samples Collected: 5
Analysis: EPA Method 680 Modified
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.1°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 30% for results >2x Reporting Limit	Field duplicate not included in this data set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	Continuing calibration did not meet method specifications and was biased on the low side for this compound. Reported result is estimated. Analyte & Samples(s) Qualified: Octachlorobiphenyls S024974-CCV2
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data; Percent recovery meets laboratory established limits.	Meets criteria.

Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA78631
Date Samples Collected: 6/26/2018
Number of Samples Collected: 2
Analysis: SW846 6010C/6020B
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	2.2°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	Field duplicated not included in this data set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	ICP Metals: Site specific MS/MSD not included in this data set. MS/MSD analyzed on a sample in a different data set from a different site. ICPMS Metals: (Batch 436299 (CA78631)): Meets criteria.
Quantitation Limits	Dilutions	MW-Y15-062618-1; CA78631: Sample result for Thallium from 5x dilution. MW-Y9-062618-1; CA78632: Sample result for Thallium from 5x dilution.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA78631
Date Samples Collected: 6/26/2018
Number of Samples Collected: 2
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	2.2°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	Field duplicated not included in this data set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	QC Batch 436527 (CA78631) (Samples: CA78631, CA78632) Mercury in the site specific matrix spike recovery is below the method criteria, therefore a low bias is likely.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA78631
Date Samples Collected: 6/26/2018
Number of Samples Collected: 2
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	2.2°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	Field duplicated not included in this data set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	No issues narrated.

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Site specific MS/MSD not included in this data set. MS/MSD analyzed on a sample in a different data set from a different site.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA79842
Date Samples Collected: 6/27/2018
Number of Samples Collected: 2
Analysis: SW846 6010C/6020B
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	3.7°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	Field duplicated not included in this data set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	ICP Metals: Site specific MS/MSD not included in this data set. MS/MSD analyzed on a sample in a different data set from a different site. ICPMS Metals: Batch 436299 (CA78631). Meets criteria.
Quantitation Limits	Dilutions	MW-AJ13-062718-1; CA79842: Sample result for Thallium from 5x dilution. MW-AE8-062718-1; CA79843: Sample result for Thallium from 5x dilution.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA79842
Date Samples Collected: 6/27/2018
Number of Samples Collected: 2
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	3.7°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	Field duplicated not included in this data set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Site specific MS/MSD not included in this data set. MS/MSD analyzed on a sample in a different data set from a different site.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA79842
Date Samples Collected: 6/27/2018
Number of Samples Collected: 2
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.7°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	Field duplicated not included in this data set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	Initial Calibration Verification (CHEM04/BNSIM_0702) The following compounds had %RSDs >20%: Acenaphthylene 22% (20%), Phenanthrene 21% (20%)

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	MS/MSD analyzed on a sample in a different data set from the same site. QC Batch 437014 (Samples: CA79842, CA79843) The MS/MSD RPD exceeds the method criteria for one or more analytes, therefore there may be variability in the reported result. (Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene)
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA80833
Date Samples Collected: 6/27/2018
Number of Samples Collected: 5
Analysis: SW846 6010C/6020B
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	3.6°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	MW-S15-062818-1; CA80836 and MW-S15-062818-2; CA80837: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	ICP & ICPMS Metals: MS/MSD analyzed on a sample in a different data set from the same site (Batch 436854 (CA81517) & Batch 436858 (CA81516)). Meets criteria.
Quantitation Limits	Dilutions	MW-AA12-062718-1; CA80833: Sample result for Thallium from 5x dilution. MW-AA16R-062818-1; CA80834: Sample result for Thallium from 5x dilution. MW-P7-062818-1; CA80835: Sample result for Thallium from 5x dilution. MW-S15-062818-1; CA80836: Sample result for Thallium from 5x dilution. MW-S15-062818-2; CA80837: Sample result for Thallium from 5x dilution.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA80833
Date Samples Collected: 6/27/2018
Number of Samples Collected: 5
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	3.6°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	MW-S15-062818-1; CA80836 and MW-S15-062818-2; CA80837: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Batch 436751 (CA80833): Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA80833
Date Samples Collected: 6/27/2018
Number of Samples Collected: 5
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	3.6°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	MW-S15-062818-1; CA80836 and MW-S15-062818-2; CA80837: Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	Initial Calibration Verification (CHEM04/BNSIM_0702) The following compounds had %RSDs >20%: Acenaphthylene 22% (20%), Phenanthrene 21% (20%)

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	MS/MSD analyzed on a sample in a different data set from the same site (Batch 437014 (CA81516)).
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA81516
Date Samples Collected: 6/29/2018
Number of Samples Collected: 2
Analysis: SW846 6010C/6020B
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	5.2°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	Field duplicate not included in this data set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	ICP Metals: Batch 436854 (CA81517) & Batch 436857 (CA81516). Meets criteria. ICPMS Metals: Batch 436858 (CA81516) & Batch 437128 (CA81517). Meets criteria.
Quantitation Limits	Dilutions	MW-28-062918-1; CA81516: Sample result for Thallium from 5x dilution. MW-35-062918-1; CA81517: Sample result for Thallium from 5x dilution.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA81516
Date Samples Collected: 6/29/2018
Number of Samples Collected: 2
Analysis: SW846 7470A
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	5.2°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	Field duplicate not included in this data set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Batch 437044 (CA81516) & Batch 437065 (CA81517): Meets criteria.
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: GCA81516
Date Samples Collected: 6/29/2018
Number of Samples Collected: 2
Analysis: SW846 8270D SIM
Reviewer: Elizabeth Doerfler

Describe the intended use of the data:
The data will be used for verification of the completion of remediation. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	5.2°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	Field duplicate not included in this data set.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	No issues narrated.

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	QC Batch 437117 (Samples: CA81517) The LCS and/or the LCSD recovery is below the method criteria. A low bias for these analytes is possible. (Acenaphthylene) The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (Acenaphthylene)
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Batch 437014 (CA81516) he MS/MSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in thesample(s) so no variability is suspected. (Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene)
Quantitation Limits	Dilutions	No dilutions.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18I1109
Date Samples Collected: 9/25/2018
Number of Samples Collected: 5
Analysis: EPA Method 680 Modified
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	Samples were received at the lab at 2.1°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	All detections in the original sample (MW-S15-092518-1) and the field duplicate (MW-S15-092518-2) were within 30% RPD with the exception of dichlorobiphenyls. It should be noted that in both samples the detection for this analyte was very low.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	Continuing calibration did not meet method specifications for decachlorobiphenyl – results are biased high.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data; Percent recovery meets laboratory established limits.	Meets criteria.

Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	N/A
Quantitation Limits	Dilutions	Zero samples were subject to dilution.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18I1195
Date Samples Collected: 9/26/2018
Number of Samples Collected: 10
Analysis: EPA Method 680 Modified
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	Samples were received at the lab at temperatures ranging between 2.9-3.7°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	A field duplicate was not collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	Continuing calibration did not meet method specifications for decachlorobiphenyl – results are biased high for this compound.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data; Percent recovery meets laboratory established limits.	Meets criteria.

Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	N/A
Quantitation Limits	Dilutions	Zero samples were subject to dilution.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18I1258
Date Samples Collected: 9/27/2018
Number of Samples Collected: 11
Analysis: EPA Method 680 Modified
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	Samples were received at the lab at temperatures ranging from 3.0-5.3°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	A field duplicate was not collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	Continuing calibration did not meet method specifications for decachlorobiphenyl – results are biased high.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data; Percent recovery meets laboratory established limits.	Meets criteria.

Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	N/A
Quantitation Limits	Dilutions	Zero samples were subject to dilution.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Con-Test Analytical Laboratory

Sample Delivery Group Number: 18I1338
Date Samples Collected: 9/27-28/2018
Number of Samples Collected: 10 (including field duplicate)
Analysis: EPA Method 680 Modified
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	Samples were received at the lab at temperatures ranging from 4.5-5.2°C The allowable hold time for the re-run of sample MW-T23-092818-1 was exceeded, however the analysis was performed before 2X the hold time.
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	Both the original sample (MW-R20-092818-1) and field duplicate (MW-R20-092818-2) contained zero detections.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	IC: RSD <20% CCV: %D <20%	Continuing calibration did not meet method specifications for monochlorobiphenyls– results are biased low.
Laboratory Control Samples (Blank Spike)	Qualifiers listed in Quality Control Data; Percent recovery meets	Meets criteria.

	laboratory established limits.	
Surrogates	Two surrogates to be spiked for all samples; Percent recovery meets laboratory established limits.	EPA Method 680 requires the use of two surrogates. ConTest reported only one surrogate. Therefore, based on professional judgment, all positive and nondetect PCB homologue group results as well as the total PCB homologue results for all samples were qualified as estimated because of the lack of a second surrogate. In initial analysis of MW-T23-092818-1 the standard surrogate recovery was outside of control limits, therefore the sample was reanalyzed.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Relative difference <40% Lab limits for %R 0-200%	N/A
Quantitation Limits	Dilutions	Zero samples were subject to dilution.
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB38518
Date Samples Collected: 9/25/2018
Number of Samples Collected: 3 (including field duplicate)
Analysis: SW846 6010C
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	Samples were received at the lab at 1.6°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	The detections in the original sample (MW-S15-092518-1) and the duplicate (MW-S15-092518-2) were within acceptable criteria except for chromium. Chromium was detected at very low levels in both samples (0.002 mg/L and 0.001 mg/L respectively).
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.

Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control (95% confidence limits) for solids	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates		Site specific MS/MSD were not collected.
Quantitation Limits	Dilutions	Zero samples were subject to dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB39894
Date Samples Collected: 9/26/2018
Number of Samples Collected: 3
Analysis: SW846 6010C
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	Samples were received at the lab at 3.8°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	A field duplicate was not collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Site specific MS/MSD were not collected.
Quantitation Limits	Dilutions	Zero samples were subject to dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB60230
Date Samples Collected: 9/27/2018
Number of Samples Collected: 1
Analysis: SW846 6010C
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	Samples were received at the lab at 3.8°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	A field duplicate was not collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates		Site specific MS/MSD were not collected.
Quantitation Limits	Dilutions	Sample MW-AJ13-092718-1 was subject to a dilution due to elevated levels of Zinc.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB61089
Date Samples Collected: 9/28/2018
Number of Samples Collected: 3
Analysis: SW846 6010C
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days	Samples were received at the lab at 3.0°C
Percent Solids	> 30%	N/A
Field Duplicate	Soils RPD ≤ 50% for results >2x Reporting Limit	A field duplicate was not collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	ICV, CCV ±10% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Site specific MS/MSD were not collected.
Quantitation Limits	Dilutions	Zero samples were subject to dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB38518
Date Samples Collected: 9/25/2018
Number of Samples Collected: 3 (including field duplicate)
Analysis: SW846 6020B
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days Mercury 28 days	Samples were received at the lab at 1.6°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV, CCV ±10% of true value	No issues narrated.

Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control (95% confidence limits) for solids	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	All samples were subject to a 1:5 dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB39894
Date Samples Collected: 9/26/2018
Number of Samples Collected: 3
Analysis: SW846 6020B
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days Mercury 28 days	Samples were received at the lab at 3.8°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	A field duplicate was not collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV, CCV ±10% of true value	No issues narrated.

Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control (95% confidence limits) for solids	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	All samples analyzed by 6020B were subject to a 1:5 dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB60230
Date Samples Collected: 9/27/2018
Number of Samples Collected: 1
Analysis: SW846 6020B
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days Mercury 28 days	Samples were received at the lab at 3.8°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	A field duplicate was not collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV, CCV ±10% of true value	No issues narrated.

Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control (95% confidence limits) for solids	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	All samples analyzed by 6020B were subject to a 1:5 dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB61089
Date Samples Collected: 9/28/2018
Number of Samples Collected: 3
Analysis: SW846 6020B
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 180 days Mercury 28 days	Samples were received at the lab at 3.0°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	A field duplicate was not collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV, CCV ±10% of true value	No issues narrated.

Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control (95% confidence limits) for solids	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± 2x RL	Meets criteria.
Quantitation Limits	Dilutions	All samples were subject to a 1:5 dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB38518
Date Samples Collected: 9/25/2018
Number of Samples Collected: 3 (including field duplicate)
Analysis: SW846 7470A
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	Samples were received at the lab at 1.6°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Meets criteria.
Quantitation Limits	Dilutions	The samples were not subject to a dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB39894
Date Samples Collected: 9/26/2018
Number of Samples Collected: 3
Analysis: SW846 7470A
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	Samples were received at the lab at 3.8°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	No field duplicate was collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	The LCS/LCSD recovery was acceptable.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	One or more analytes of the site specific matrix spike recovery was below method criteria, therefore low bias is likely.
Quantitation Limits	Dilutions	The samples were not subject to a dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB60230
Date Samples Collected: 9/27/2018
Number of Samples Collected: 1
Analysis: SW846 7470A
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	Samples were received at the lab at 3.8°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	No field duplicate was collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Meets criteria.
Quantitation Limits	Dilutions	The sample was not subject to a dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB61089
Date Samples Collected: 9/28/2018
Number of Samples Collected: 3
Analysis: SW846 7470A
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	< 6 ° C 28 days	Samples were received at the lab at 3.0°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	No field duplicate was collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	"r" ≥ 0.995 ICV ±10% of true value CCV ±20% of true value	No issues narrated.
Laboratory Control Samples (Blank Spike)	LCS recoveries ±20% for aqueous media and within vendor control	Meets criteria.

	(95% confidence limits) for solids	
Site Specific Matrix Spikes and Matrix Spike Duplicates	MS percent recovery 75-125% MSD for solids if conc >5x RL, RPD <35%. If conc. < 5x RL, difference ± RL	Meets criteria.
Quantitation Limits	Dilutions	The samples were not subject to a dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB38518
Date Samples Collected: 9/25/2018
Number of Samples Collected: 2 (including field duplicate)
Analysis: SW8081B
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	Samples received at the lab were 1.6°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	Meets criteria.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	No issues narrated.

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	The LCS/LCSD RPD exceeds method criteria for a-BHC. This analyte was not reported so no variability is suspected.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Quantitation Limits	Dilutions	These samples were not subject to dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB39894
Date Samples Collected: 9/26/2018
Number of Samples Collected: 2
Analysis: SW8081B
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	Samples received at the lab were 3.8°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	A field duplicate was not collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	Aldrin is below method criteria, low bias is possible.

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	The LCS/LCSD RPD exceeds the method criteria for Aldrin. These analytes were not reported so no variability is suspected.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Quantitation Limits	Dilutions	These samples were not subject to dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB60230
Date Samples Collected: 9/27/2018
Number of Samples Collected: 2
Analysis: SW8081B
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	Samples received at the lab were 3.8°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	A field duplicate was not collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	Aldrin is below method criteria, low bias is possible.

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	Meets criteria.
Quantitation Limits	Dilutions	These samples were not subject to dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A

DATA USABILITY EVALUATION WORKSHEET

Project Name: Greenwich High School
Laboratory: Phoenix Environmental Laboratories

Sample Delivery Group Number: CB61089
Date Samples Collected: 9/28/2018
Number of Samples Collected: 2
Analysis: SW8081B
Reviewer: Matt Kenney

Describe the intended use of the data:
The data will be used for groundwater monitoring. The data have met the reasonable confidence requirements with the exceptions noted below. In addition, the data appear valid as reported and may be used for decision making purposes. No data were rejected.

Nonconformance DQA Review Elements	Criteria	Briefly Summarize DQA Nonconformances
Laboratory Report Inspection		Complete
Reasonable Confidence Evaluation	You have Reasonable Confidence if the answers to questions 1, 1A, and 1B are Yes.	Meets criteria.
Chain of Custody Evaluation	Analyses agree with COC	COC accompanied samples, analyses agree with COC.
Sample Preservation and Holding Time Evaluation	<6 °C Extraction 7 days (aqueous), 14 days (soil); 40 days to analysis (aqueous and soil)	Samples received at the lab were 3.0°C
Percent Solids	> 30%	N/A
Field Duplicate	GW RPD ≤ 30% for results >2x Reporting Limit	A field duplicate was not collected.
Method Blank	< RLs	Meets criteria.
Equipment Blanks	< RLs	None taken.
Initial and Continuing Calibration	% RSD ≤ 15%, "r" ≥ 0.990 % difference or drift ≤ 30%	No issues narrated.

Laboratory Control Samples (Blank Spike)	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	The LCS/LCSD RPD exceeds method criteria for a-BHC and Aldrin. These analytes were not reports so no variability is suspected.
Surrogates	Percent recovery 30-130%	Meets criteria.
Site Specific Matrix Spikes and Matrix Spike Duplicates	Percent recovery 40-140% for base-neutrals and 30-130% for acid compounds	The MS/MSD exceeds method criteria for 4,4-DDD and methoxychlor. There may be variability in these analytes.
Quantitation Limits	Dilutions	These samples were not subject to dilution.
Tentatively Identified Compounds		N/A
Other QC data		N/A