

**NEW STREET INFRASTRUCTURE AND STREETScape IMPROVEMENTS
AND
CONCORD LANE SEWER SEPARATION PROJECT**

**CAMBRIDGE, MA
UTILITY RELATED ABATEMENT MEASURE (URAM) PLAN
RTN 3-32992**

JUNE 2015



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1. INTRODUCTION

This Utility Related Abatement Measure (URAM) Plan is being submitted by Kleinfelder on behalf of the City of Cambridge, Massachusetts Department of Public Works (DPW) to allow for the management of soil and groundwater impacted by oil or hazardous materials (OHM) above Massachusetts Contingency Plan (MCP) RCS-1 and RCGW-1 or RCGW-2 Reportable Concentrations, as applicable.

Kleinfelder is providing engineering design and construction support to the City of Cambridge, DPW for the New Street Infrastructure and Streetscape Improvements and Concord Lane Sewer Separation Project in Cambridge, Massachusetts (the Project). The Project consists of subsurface infrastructure work and surface work on Concord Lane and New Street.

Work associated with Concord Lane will be conducted in both the Public Right of Way (ROW) and on private property. The portion of Concord Lane south of approximate project station 3+25 is a public ROW (Station locations are provided in Figure 2). The work in this portion will include private inflow connections requiring excavations on private property. The portion of Concord Lane north of the public ROW is private property and is part of the Fresh Pond Mall located at 186 Alewife Brook Parkway. Work in the private property will be conducted in accordance with a temporary right of entry permit rather than a permanent easement. Following construction, the property owner will be responsible for the work area and the planned improvements.

Work associated with New Street will be conducted in both the New Street Public ROW and within an existing permanent easement on the parcel located at 26 New Street (also referenced as 22-28 New Street). The permanent easement is located along the south property line of the parcel.

The General Contractor for the construction of the Project is Barletta Heavy Division, Inc. (Barletta).

Kleinfelder is submitting this URAM Plan in response to a) the presence of existing MCP sites and the former Cambridge dump ("Old City Dump") that may have impacts in the Project work area and b) findings of lead and petroleum-related compounds at concentrations exceeding MCP Reportable Concentrations in samples collected by Kleinfelder from the Project area in the Concord Lane and New Street work areas. The URAM addresses work performed in the public

ROW, the permanent easement, on private properties to address inflow and illicit connections, and at the Fresh Pond Mall property.

Separate Release Abatement Measures (RAMs) will be conducted if needed for private properties with Activity and Use Limitations (AUL). At the discretion of the Licensed Site Professional (LSP)-of-Record, a separate URAM may be initiated if a distinct and separate area or type of contamination is encountered.

Verbal notification of the City's intent to conduct a URAM was provided to the Massachusetts Department of Environmental Protection (MassDEP) on June 30, 2015. MassDEP assigned Release Tracking Number (RTN) 3-32992 to this URAM. Figure 1, URAM Location Plan, indicates the area of work associated with the Project and covered under this URAM. Soils and groundwater excavated or extracted as part of the Project, and containing OHM at concentrations greater than RCS-1 or RCGW-1 or RCGW-2 as applicable, will be managed under this URAM.

A Bureau of Waste Site Cleanup (BWSC) Transmittal Form BWSC-119 ([URAM Transmittal](#)) was submitted electronically concurrent with this written plan utilizing eDEP. A validated (unsigned) copy is attached as Appendix A for reference purposes.

2. PERSON UNDERTAKING URAM

This URAM is being implemented by the City of Cambridge, Department of Public Works.

Contact: Ms. Katherine Watkins
City Engineer

Address: Cambridge Department of Public Works
147 Hampshire Street
Cambridge, Massachusetts 02139

Tel.: 617-349-4800

3. LICENSED SITE PROFESSIONAL

Because greater than 20 cubic yards of contaminated soil may be encountered and require management under this URAM, a LSP must oversee implementation of the URAM. The LSP of Record for this URAM will be:

Martha L. Zirbel

LSP License No. 9451

Kleinfelder

215 First Street, Suite 320

Cambridge, MA 02142

Telephone: 617-497-7800

4. UTILITY PROJECT DESCRIPTION

The Concord Lane portion of the Project is part of the Massachusetts Water Resources Authority (MWRA) Long Term Combined Sewer Overflow (CSO) Control Plan for the Alewife Brook, which will separate existing combined sewers and provide dedicated sanitary sewers and stormwater drains. The principal goals of the Project are to: improve water quality in the Alewife Brook by eliminating combined sewer overflows; protect Fresh Pond Reservoir from potential contaminants; and, control the occurrences of street flooding and sewer and stormwater backups on public and private properties.

The Concord Lane subsurface portion of the Project will include the separation of approximately 1,700 linear feet (lf) of combined sewer along Concord Lane by: common manhole separation; replacement, rehabilitation, or addition of Reinforced Concrete Pipe (RCP), Polyvinyl Chloride Pipe (PVC), and Ductile Iron (DI) storm and sewer pipe between the sizes of 6-inches to 24-inches in diameter and associated manholes; replacement and addition of approximately 6 catch basins with hoods and 6-foot sumps; the removal of illicit service and inflow connections and private inflow removal work; completion of the illicit connection survey; and coordination with gas, electric, telecom, and water utilities for relocations and support of existing infrastructure during construction..

The Concord Lane surface work will include roadway restoration for approximately 1,600 lf of roadway and 600 lf of sidewalks on Concord Lane including full depth roadway construction; asphalt excavation by cold planer; pavement overlay; granite curbing; and concrete sidewalk reconstruction.

The New Street subsurface portion of the Project will include: the conversion of an existing catch basin located within an easement at 26 New Street to a groundwater pump station; installation of a new sewage pump station; installation of approximately 310 lf of 4-inch DI force main; installation of approximately 100 lf of 8-inch DI force main and associated manholes and catch basins; installation of drainage structures and catch basins on New Street to accommodate the surface design; and coordination with gas, electric, telecom, and water companies for relocations and support of existing infrastructure during construction.

The New Street surface work will include roadway restoration of approximately 1,500 lf of roadway and sidewalks on New Street including full depth roadway construction; asphalt excavation by cold planer; pavement overlay; granite curbing; concrete sidewalk reconstruction; and the installation of curb extensions and raised crosswalks for pedestrian safety and traffic calming.

A portion of the New Street surface work will be conducted within the historical limits of the Old City Dump, and will comply with a Landfill Modification Permit (application currently being prepared) and any conditions imposed by MassDEP Bureau of Waste Prevention in its approval.

The URAM will apply to surface work only to the extent that it involves management of contaminated soil and/or groundwater

The Project includes planned excavation and off-site reuse or disposal of approximately 11,000 tons of soil from the Concord Lane and New Street work areas. Based on an environmental evaluation of the two areas and experience to date in the area, Kleinfelder estimates that of this total, 2,500 tons and 5,000 tons of contaminated soil from the Concord Lane and New Street work areas, respectively, may be managed under this URAM.

5. ENVIRONMENTAL ASSESSMENT OF URAM AREA

Based on historic land uses and existing listed disposal sites, excavation and dewatering may potentially encounter hazardous conditions or result in the generation of contaminated soil and groundwater that must be managed under a URAM. These conditions are as follows:

- Proximity of work on Concord Lane and New Street to the Old City Dump, currently operated as Danehy Park, and the location of reported releases of methane identified in catch basins and in the permanent easement at 26 New Street;
- Fill, potentially containing ash, debris, and solid waste, historically used in clay pits and low-lying areas documented to exist in the areas of work that may be encountered during excavation;
- Current or former gasoline stations with known releases of petroleum at 545 Concord Avenue, 515 Concord Avenue and 480 Fresh Pond Parkway;
- Proximity of work to recent DPW projects conducted as URAMs at or near the New Street Pump Station at 22-48 New Street (2000), and 480 Fresh Pond Parkway (2001);
- Proximity of work behind Bay State Road, to releases of Resource Conservation and Recovery Act (RCRA) listed wastes, located at 23 Bay State Road and 445 Concord Avenue; and
- Proximity of work to properties with AULs located at 220 Alewife Brook Parkway, 87 New Street, and 23 Bay State Road.

These conditions are described in more detail below and their locations are depicted on Figure 1.

5.1 HISTORIC FILL AND LAND USES

Both the Concord Lane and New Street areas historically were within the “Great Swamp” associated with Fresh Pond and Alewife Brook. The area was sparsely developed in 1886 with buildings adjacent to Concord Avenue and between the current alignments of Concord Lane and New Street. The south section of New Street extending from Concord Avenue was present as early as 1886. The north portion of the current New Street alignment was within the limits of the large, flat bottom clay pit that was used for municipal waste disposal beginning in the 1950s by the City of Cambridge. A 1946 topographic map indicates that the bottom of the pit was at elevation of 44 feet below sea level.

Based on information related to MCP activities at 87 New Street, municipal waste was identified to a depth of 40 feet, confirmation that the Old City Dump likely extends beneath and west of the New Street ROW. The dump was later closed and developed into Danehy Park by the City of

Cambridge. The closed landfill and buried waste may also be a source of landfill gas which has the potential to migrate. Methane gas has been reported in nearby catch basins and at the residential complex at 87 New Street, as discussed below.

The current Concord Lane is adjacent to both the alignment of a former railroad spur leading from icehouses on the north shore of Fresh Pond and to the former Watertown Branch of the Fitchburg Railroad.

Since the early 1900s, the area has largely been developed for commercial use. The *Survey of Architectural History in Cambridge, Report Five: Northwest Cambridge (1977)* indicates that the northern portions of Concord Lane and New Street, and the permanent easement at 26 New Street were located within brickyards. More recently, manufacturing operations were ongoing to the west of the Concord Lane alignment, and along Bay State Road. Several current and former gas stations were located along Concord Avenue and Fresh Pond Parkway abutting the Project areas.

5.2 EXISTING RELEASES

Multiple MCP disposal sites exist within or abutting the overall Project limits. Contamination associated with some of the disposal sites may have impacted soil or groundwater within the planned excavation areas. A review of the MassDEP Site database indicated the following MCP Disposal Sites in proximity to the Project area as shown on Figure 1:

Release Tracking Number (RTN) 3-1759, 186 Alewife Brook Parkway, is the location of the Fresh Pond Mall, which includes the Concord Lane work area. The property was listed as a “location to be investigated” in 1993 but a specific release was not reported. Prior to the 1960’s, the property was the location of Prest-O-Lite Corporation, which generated calcium hydroxide as part of its manufacturing process and disposed of the material on the property. The material, which is described as “chalky”, was encountered during site investigations. The investigation reports noted that prior to the 1930’s the property was the location of a clay pit. Following various site investigations between 1985 and 1993, a LSP opinion filed in 1995 concluded that the property was not a disposal site but could potentially be impacted by oil tanks located on other properties and contaminant migration from the Old City Dump to the east.

RTN 3-25347, 42-46 Concord Lane, is located within the Fresh Pond Mall Property in the Concord Lane alignment. A release of OHM was reported in 2005 when excavation for the

installation of a hydrant by the Cambridge Water Department encountered oily soil and groundwater at the rear of the property building. A subsurface investigation indicated elevated concentrations of volatile petroleum hydrocarbons (VPH), extractable petroleum hydrocarbons (EPH), and polycyclic aromatic hydrocarbons (PAHs). A Release Abatement Measure (RAM) was conducted in 2006 to excavate petroleum contaminated soils. The excavation extended to an area of approximately 30 by 20 feet and to a depth of 5 to 6 feet and removed a total of approximately 125 tons of soil. Stockpile samples generated during the RAM were found to have up to 24,200 mg/kg total lead and 98.5 mg/l Toxicity Characteristic Leaching Procedures (TCLP) lead, well above the limit of 5 mg/l for a RCRA characteristically hazardous waste. Characteristically hazardous waste soil was transported to a hazardous waste landfill in New York for disposal. On site testing and confirmation sampling indicated that petroleum contamination had been removed. The petroleum contamination was attributed to a former UST and remote fill pipe removed in in the 1990's. Residual lead and PAH contamination was attributed to ash and fill. Based on the results of a Risk characterization, a Class A-2 Response Action Outcome (RAO) was submitted for the site.

RTN 3-26367, 200-210 Alewife Brook Parkway, is located within the Fresh Pond Mall Property near the Concord Lane alignment. A release of OHM was reported in 2006 when soil with elevated concentrations of lead (up to 15,300 mg/kg) were encountered during test pit excavation prior to installation of an electrical duct bank being installed for an addition at the south end of the Fresh Pond Mall Building. A RAM was performed to remove and dispose of the soil off-site at a hazardous waste landfill in Michigan. Confirmatory sampling following the completion of the RAM indicated that some samples had concentrations of over the MCP Reportable Concentration RCS-1 limit of 300 mg/kg (as of 2006) with several over 1,000 mg/kg. Groundwater sampling and analysis for lead indicated that concentrations of dissolved lead and total lead were intermittently detected in on-site monitoring wells but were not detected in additional samples required in response to a MassDEP Notice of Noncompliance in 2010. A revised Class A-2 RAO was submitted for the site in 2010.

RTN 3-20815 and RTN 3-23925, 220 Alewife Brook Parkway, is the location of the Tria Hotel. RTN 3 20815 applies to the entire property; a Class A-3 RAO with an Activity and Use Limitation was recorded for the property. Contamination is associated with the presence of PAHs attributed to the historic fill. Disposal site 3-23925 is associated with the presence of gasoline-related compounds in groundwater, attributed to a historical gasoline storage tank on an upgradient property at 545 Concord Avenue. During site investigations in 2008 and 2009, arsenic was detected in soil at a concentration of 53 mg/kg, above the RCS-1 criteria. Lead was

detected in in situ-samples adjacent to Concord lane at concentrations above the TCLP lead limit. The documents for this site also indicate that properties adjacent to Concord Lane at 545 Concord Avenue and 527-529 Concord Avenue were the sites of historical filling stations.

RTN 3-27170 and 3-27549, 517-527, Concord Avenue, is located in proximity to Concord Lane and is the location of a subsurface release of petroleum hydrocarbons related to historic filling of the property. Soil and groundwater are both impacted. EPH fractions, PAHs, petroleum-related VOCs, and arsenic and lead were detected in soil at concentrations exceeding RCS-1 concentrations. The highest concentrations were located within 5 feet of the surface. RTN 3-27549 is specifically related to petroleum contamination in groundwater which is attributed to former USTs used for oil storage at an upgradient source at 515 Concord Avenue. A Class B-1 RAO concluded that there was a condition of no significant risk related to soil contamination and no remediation was conducted.

RTN 3-19521, 3-20577, and 3-25331, 515 Concord Avenue, is the location of a retail gasoline station and the location of three reported petroleum releases. RTN 3-19521 is related to detections of petroleum-related compounds in groundwater in 2000. RTN 3-20577 is associated with a 2001 2-hour notification following a release of 40 gallons of hydraulic oil from a hydraulic lift in a service bay. An Immediate Response Action (IRA) was performed to excavate contaminated soil and repair piping. RTN 3-25331 is associated with a release of hydraulic fluid from a second hydraulic lift, resulting in an IRA which removed 20 cubic yards of impacted soil, an abandoned hydraulic fluid UST, and 5,000 gallons of impacted groundwater. Investigation activities were conducted between 2001 and 2010. Contamination was reported to extend into Concord Avenue. Non-aqueous phase petroleum product (NAPL) was detected in monitoring wells on the property. In 2008, a RAM was conducted to manage impacted soil and groundwater encountered during an upgrade of the hydraulic lift system. Phase V Remedy Operation Status (ROS) activities consisting of groundwater monitoring were conducted between 2008 and 2010.

Lead and cadmium attributed to the presence of historical fill soils containing ash have been detected in soil at concentrations above the RCS-1 criteria. PAHs have been detected at concentrations exceeding RCS-1 criteria and have also been partially attributed to historical fill and the nearby rail alignment. In groundwater, VPH, EPH, benzene and methyl tertiary butyl ether (MTBE) have been detected above Method 1 GW-1 standards at the site. Lead was also detected above the Method 1 GW-1 criteria, but was attributed to particulates in the groundwater sample. A Class C-1 RAO was submitted for the site in 2010, demonstrating that

contaminant sources had been controlled, that a temporary solution had been achieved, that there was no substantial hazard associated with groundwater, and that there was not a significant risk to human health, safety, public welfare or the environment associated with exposure to soil.

RTN 3-32213, 75 New Street is the location of arsenic, lead, barium, total petroleum hydrocarbons (TPH), and PAHs in soil exceeding RCS-1 standards. Based on records available on the MassDEP Waste Site Reportable Release LookUp database, RTN 3-32213 was assigned to the release in June 2014. No additional documents were readily available for review.

RTN 3-28725, 87 New Street, is the location of a recently constructed 45-unit residential condominium complex with an underground garage. Prior to this use, the site had been owned by a brick manufacturer. Fill, including materials excavated during construction of the MBTA subway line in Cambridge, was placed on the property in the 1980's during the development of Danehy Park. Site investigations indicated the presence of substantial filling to a depth of 40 feet below ground surface. Soil samples collected in 2009 indicated the presence of lead and PAHs at concentrations greater than RCS-1 standards as well as petroleum-related VOCs. A RAM was conducted in 2009 and 2010 to excavate and remove impacted soils associated with construction. In total 8,950 cubic yards was removed from the site. Soil sampling associated with the RAM indicated lead concentrations as high as 13,000 mg/kg. TCLP testing of stockpile sampling indicated the soil was characteristically hazardous for lead and required stabilization prior to disposal.

Elevated concentrations of arsenic, barium, cadmium, and chromium, exceeding the RCS-1 concentrations, were also detected in soil samples. Polychlorinated biphenyls (PCBs) were detected at concentrations less than RCS-1 concentrations. Groundwater sampling and analysis indicated that total lead was detected in groundwater at a concentration exceeding the Method 1 Risk Assessment GW-3 criteria but the results were attributed to particulates in the groundwater. Soil vapor sampling and monitoring of catchbasins and structures detected elevated methane and carbon dioxide levels and depressed oxygen levels, indicating the presence of landfill gas. Combustible gas monitoring indicated that the mix of gases exceeded the reportable limit of 10% of the lower explosive limit (10% LEL) in some locations. A subslab vapor barrier was installed in the building. An AUL was implemented to control site exposures by residents; a risk characterization concluded there was a condition of no significant risk under the terms of the AUL. Relevant to the proposed work, the AUL requires a health and safety plan

and a soil management plan for removal or disturbance of soil. The AUL also requires the repair or replacement of the existing soil cover with an equivalent barrier. The cover consists of three feet of clean soil, building slab, or pavement, which is to be maintained and inspected by the property owner(s). Since an AUL has been implemented at the Site, work within the boundaries of the AUL, if required, will be completed as a RAM in lieu of a URAM.

RTN 3-1655, Old City Dump, was assigned a RTN by the MassDEP but is considered adequately regulated under Massachusetts Solid Waste Regulations. The property has been developed into Danehy Park, but undergoes regular post-closure perimeter monitoring of groundwater and landfill gas. The limit of waste material associated with the Old City Dump extends beyond the limits of Danehy Park, as described above.

RTN 3-24566, 3-31279, 3-23991, Methane Migration from Danehy Park/Old City Dump. The presence of methane gas is monitored on a regular basis as part of landfill post-closure monitoring. Methane has occasionally been reported at levels exceeding 10% LEL in catch basins in and adjacent to New Street, as shown in Figure 1, resulting in notifications to MassDEP under the MCP. Based on readings in New Street catch basins, methane gas may also be present at the north end of the Concord Lane work area where it approaches the limits of the landfill. Methane gas was also detected at 87 New Street, as described above.

RTN 3-19082, RTN 3-31307, 22-48 New Street. RTN 3-19082 is associated with chlorinated volatile organic carbons (CVOCs) detected in groundwater at the property in March, 2000. Site investigations conducted by others determined that contaminant concentrations on Site did not pose an Imminent Hazard or require IRAs. A Downgradient Property Status (DPS) was filed for the Site, attributing the contamination to the 23 Bay State Road property or "other upgradient properties." Groundwater was determined to flow towards City of Cambridge Pump Station to the southeast; therefore, this release has the potential to impact the easement. RTN 3-31307 is associated with findings of arsenic, lead, and PAHs detected in soil samples in 2012 and attributed to the presence of historic fill. A Phase I Initial Site Investigation was completed in 2013.

RTN 3-17932, Pump Station and Storage Tank-New Street, is the location of a URAM performed on behalf of Cambridge DPW to support construction of piping and utilities in New Street and a pump station on the adjacent property at 22-48 New Street. The URAM was triggered in 2000 when excavation encountered soil contaminated with TPH, PAHs, lead and

antimony exceeding RCS-1 limits and TCLP lead exceeding regulatory limits. Vinyl chloride and trichloroethylene (TCE) were detected at concentrations greater than RCGW-1 criteria. Soil contamination was attributed to solid waste and fill material used to fill the former clay pits. Soil from the pump station area was observed to contain debris consisting of glass, brick, cans, scrap metal and wood. Soil determined to be characteristically hazardous for lead was treated in a container to remove the toxicity characteristic.

Soil from the New Street ROW was reported to contain large amounts of unspecified debris. Groundwater contamination was attributed to a release at 57 Bay State Road to the east. During excavation, groundwater was treated using a bag filter to remove solids and granular activated carbon units (GAC) prior to discharge to the Massachusetts Water Resources Authority (MWRA) system. Clay dams, concrete, or flowable fill were placed along pipelines to minimize migration of contamination in groundwater. Dust monitoring was conducted during soil management activities.

URAM Status reports were submitted to MassDEP in March 2001 and July 2001. A URAM Completion report was prepared by Kleinfelder (formerly S E A Consultants, Inc.) and submitted to MassDEP in February 2002.

RTN 3-959 and RTN 3-12881, 445 Concord Avenue is the location of the Former Midland Ross Company and currently operates as Cambridge Self Storage. This Site occupies the entire block between Birch Street and Fern Street, and extends east of Fern Street towards Corporal Burns Road. Uses of the property by the Midland Ross Corporation, an electronics manufacturer, prior to 1986 resulted in releases of chlorinated solvents and petroleum to the subsurface. Additionally, Site soils have been noted to contain brick, cinders, glass, wood, rubber and metal, as well as peat. Since 1988, the most prevalent compounds detected at the Site were the CVOCs TCE, dichloroethene (DCE) and vinyl chloride (VC). The highest concentrations of CVOc contamination, which includes dense non-aqueous phase liquid (DNAPL), is located in the northern portion of Fern Street, with DNAPL located on top of a clay layer at about 10 feet below grade; soil impacts have been identified from the surface to approximately 15 feet below grade. As of the last status report published for the Site, up to 1.2 feet of DNAPL are present in Site well GEI-211, located under Fern Street. A DNAPL recovery system was installed in 1992, and currently operates with one pump in GEI-211. VPH, EPH, and multiple types of light non-aqueous phase liquid (LNAPL) are also present. These contaminants are concentrated in the center of the block between Fern Street and Birch Street. Hand bailing of LNAPL is performed regularly. A Class C-1 RAO was filed for the Site on February 7, 2006. In

March 2009, MassDEP audited the Site and issued a Notice of Noncompliance. Violations included failure to demonstrate No Substantial Hazard and failure to provide a monitoring plan and regular status reports. The most recent status report for the Site was filed on August 29, 2011. According to that report, NAPL at greater than ½ inch thickness persists at the Site in some locations, recovery of DNAPL is ongoing, and indoor air monitoring is being performed at a residence at 74 Field Street and at the offices at the storage facility.

RTN 3-15863, 23 Bay State Road is the location of chlorinated solvents, petroleum-related compounds, and PAHs identified in soil excavated during construction of a building addition at a property formerly owned by 3M. The RTN was assigned in 1997 and a RAM was implemented in 1998 to manage soils from the excavation. Based on available records, the most heavily impacted soil on this Site has been removed. Tetrachloroethylene (PCE), TCE, VC, chlorobenzene and 1,2 chlorobenzene were the primary solvents identified and were detected in soil and groundwater on the northeast portion of the property, including and adjacent to the permanent sewer easement located in the Project area. Measured groundwater elevations indicated a significant flow gradient toward the New Street Pump Station northeast of the property. A Phase II Comprehensive Site Investigation, prepared in 2000 by Roy F. Weston, Inc., concluded that the pump station capture limited the off-site migration of contaminated groundwater from the Site, and that neither soil or groundwater posed a significant risk. An A-2 RAO was submitted in 2001.

In July 2003, 3M Corporation (as a Potentially Responsible Party (PRP)) performed additional sampling at the Site prior to the sale of the property to 23 Bay State Road Limited Partnership. A MassDEP audit in 2009 indicated that the submittal was invalid and additional assessment work was required. 3M, which remains the primary PRP for the Site, responded with a technical justification for not performing additional groundwater monitoring, based largely on the limited potential for groundwater migration based on the influence of the New Street Pump Station. A meeting held in May 2011 between 3M and MassDEP focused on the potential future risk to indoor air posed by a residential use scenario. A Notice of AUL, primarily pertaining to indoor air exposure, was recorded at the South Registry District of Middlesex County in June 2014. A Class A-3 RAO pertaining to indoor air exposure was submitted to MassDEP in June 2014 by Weston Solutions, Inc. The 2014 A-3 RAO concluded that a level of No Significant Risk pertaining to a potential future indoor air exposure pathway at the Site with the implementation of an AUL.

Since an AUL has been implemented at the Site, work within the boundaries of the AUL, if required, will be completed as a RAM in lieu of a URAM. Based on review of the site history, chlorinated solvents from the site, if detected in soil or groundwater, would be considered to be RCRA listed wastes.

RTN 3-13307, 57 Bay State Road is the location of VC identified in groundwater. The finding was reported to MassDEP in 1996. A DPS opinion was submitted in 1996, attributing the presence of CVOCs to leachate from the Cambridge Landfill. This conclusion was based on a 1995 monitoring report by Camp Dresser McKee (CDM) that identified CVOCs in groundwater in the landfill. Compounds detected on the property included VC (up to 790 µg/L) and 1,1-dichloroethene (up to 60 µg/L), as well as TCE, PCE and several other CVOCs below applicable standards.

RTN 3-2382, 480 Fresh Pond Parkway, is the location of a release of gasoline discovered during a UST replacement conducted in 1988. At the time of the UST removal, 1550 cubic yards of soil were excavated and removed from the Site, and soil and groundwater investigations were performed. Benzene, toluene, ethylbenzene and xylenes (BTEX) were detected in groundwater. NAPL was detected south of the UST location (away from the project area). A NAPL recovery system was installed in 1990 but is no longer in use. During monitoring activities conducted in 1994 and 1996, NAPL was not detected on Site, but BTEX and methyl tertiary butyl ether (MTBE) were still detected in several wells. In 2001, work in Sozio Circle was performed as a URAM by the City of Cambridge when petroleum contaminated soils were encountered in utility trenches. A Class C-2 RAO, indicating that a Temporary Solution was achieved for the Site, but that a condition of No Significant Risk had not yet been achieved, was filed in November 2012. Recent sampling results have indicated that petroleum compounds persist in Sozio Circle, possibly from a source other than RTN 3-2382. NAPL from the site is not expected to impact the project.

5.3 PRE-CONSTRUCTION SUBSURFACE INVESTIGATION-CONCORD LANE WORK AREA

5.3.1 Subsurface Investigation

Between July 28, 2014 and July 30, 2014, seven soil borings (B-351, B-352, B-353, B-354, B-355, B-356, and B-357) were advanced by Carr-Dee Corporation (Carr-Dee) of Medford, Massachusetts under supervision of Kleinfelder. Borings B-351 and B-352 were located within the Concord Lane ROW and the remaining five borings were located on the Fresh Pond Mall

property. Borings B-351, B-353, B-355, and B-357 were completed as observation wells to a depth of 15 feet below grade surface (bgs).

Soil was screened using a photoionization detector (PID) during subsurface investigations. PID readings ranged from non-detect to 23.0 parts per million by volume (ppmv) (at B-352). Fill, including brick fragments and ash, was identified in borings to depths ranging from 1.5 feet bgs to 8 feet bgs. A strong unspecified odor was noted from 4 - 6 feet bgs in boring B-355 and from 4 – 5.5 feet bgs in B-357A. Calcium hydroxide was noted in boring B-357 within the fill layer between 1.5 and approximately 8 feet. Refer to Figure 2 for boring locations.

On September 29, 2014, four soil borings (ENV-1 through ENV-4) were advanced by Carr-Dee under supervision of Kleinfelder. Soil was screened using a PID during subsurface investigations. PID readings ranged from non-detect to 84.7 ppmv (at ENV-2). Fill, including brick fragments and wood, was identified in borings to depths ranging from 3 feet bgs to 6 feet bgs. An asphalt odor was noted from 5 - 6 feet bgs in boring ENV-2. Refer to Figure 2 for boring locations.

On November 19, a test pit (TP-CL-2) was excavated in the area shown on Figure 2. Fill materials including ash, glass, brick, wood fragments, concrete, and clinker were encountered to depths ranging from 1 to approximately 5 feet bgs.

Soil samples were obtained from selected borings during the July 2014 and September 2014 events and submitted to Con-Test Analytical Laboratory of East Longmeadow, Massachusetts for analysis for RCRA 8 metals; VOCs by U.S. EPA Method 8260B; semi-volatile organic compounds (SVOCs) by U.S. EPA Method 8270D; PCBs by U.S. EPA Method 8082, conductivity by Method 9050A, pH, flashpoint, reactivity, and/or fingerprint by 8015C. Because of the high potential for RCRA toxicity characteristic, as encountered at nearby RTNs, samples from the November 19, 2014 event and additional samples from the July 2014 and September 2014 events were analyzed for total lead. TCLP analysis was performed for compounds which were detected above the RCRA “Rule of 20”. Soil sample results are tabulated in Table 1.

5.3.2 Soil Analytical Results

TPH was detected above reporting limits in all samples collected for TPH analysis. TPH was detected above the RCS-1 standard in samples ENV-2 1-8 and ENV-4 1-9. The TPH concentration in boring ENV-4 1-9 exceeds the reuse requirements for unlined Massachusetts

landfills presented in Table 1 of MassDEP Policy # COMM-97-001, but does meet the requirements for lined landfills.

SVOCs were detected above reporting limits in all samples collected for SVOC analysis. PAHs including acenaphthene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, 2-methylnaphthalene, naphthalene, and/or phenanthrene were detected above RCS-1 standards in samples B-351A 0.5-6, ENV-2 1-8, ENV-3 0.5-8, and ENV-4 1-9. The total SVOC concentrations detected in borings ENV-2 1-8 and ENV-4 1-9 exceed the reuse requirements for lined and unlined Massachusetts landfills presented in Table 1 of MassDEP Policy # COMM-97-001.

PCBs were not detected at or above reporting limits in in samples analyzed for PCBs with one exception. PCB 1260 was detected in sample ENV-2 1-8 at a concentration of 1.0 mg/kg, equal to the RCS-1 standard.

VOCs were not detected above reporting limits in two samples. Benzene was detected at a concentration of 0.002 mg/kg in B-351A 2-4, which is well below the RCS-1 standard of 2 mg/kg. Naphthalene was detected at 99 mg/kg in sample ENV-2 S3 5-5.9. In addition, several VOCs reporting limits were above RCS-1 standards in sample ENV-2 S3 5-5.9. Total VOC concentrations in sample ENV-2 S3 5-5.9 exceeds the reuse requirements for lined and unlined Massachusetts landfills presented in Table 1 of MassDEP Policy # COMM-97-001 and out of state disposal may be required.

The metals arsenic, barium, cadmium, chromium, and mercury were detected at concentrations above laboratory reporting limits but below RCS-1 standards in all samples analyzed for metals. Lead was detected in all samples analyzed above reporting limits and exceeded the RCS-1 criteria in four samples: B-351a 2-6, B352b 0.5-6, ENV-3 0.5-8, and TPCL-2. TCLP lead exceeded the toxicity characteristic limit for Samples B351 (2-6) and TPCL-2, indicating that the soil may be characteristically hazardous for lead.

5.3.3 Groundwater Analytical Results

On September 28, 2014, groundwater samples were obtained via low flow methodology from borings that had been completed as monitoring wells. Samples were referenced as MW-351, MW-353, MW-355, and MW-357 from corresponding borings B-351, B-353, B-355, and B-357.

An organic sheen was noted on groundwater purged from MW-355. Foam and a strong odor tentatively identified as hydrogen sulfide were noted in groundwater purged from MW-357.

Groundwater samples (MW-351, MW-353, MW-355, and MW-357) were submitted to Con-Test for analysis of VOCs by EPA Method 624, total and dissolved RCRA 8 metals, antimony, copper, iron, manganese, nickel and zinc, EPH fractions, VPH fractions, pH, cyanide, formaldehyde, and/or SVOCs. Refer to Table 2 for a summary of analytical data.

Analytical results for sample MW-351 were compared to MCP RCGW-1 standards since the well is located within the Zone A protection area surrounding Fresh Pond. Analytical results for monitoring wells MW-353, MW-355, and MW-357 were compared to MCP RCGW-2 standards since these wells are not located within a public drinking water supply protection area. During the September 2014 groundwater monitoring event, no compounds were detected above MWRA discharge limits in the monitoring wells sampled. However, the pH of samples MW-353 and MW-357 were measured at the MWRA upper discharge limit of 12. Lead was detected at a concentration of 33.1 ug/L in MW-353, which exceeds the RCGW-2 standard of 10 ug/L. However, dissolved lead was not detected in the same sample, suggesting that the total lead detected was associated with sediment in the sample and is not representative of dissolved concentrations in groundwater. Data collected on September 28, 2014 is summarized on Table 2.

5.4 PRE-CONSTRUCTION SUBSURFACE INVESTIGATION-NEW STREET WORK AREA

5.4.1 Subsurface Investigations

A Memorandum dated October 23, 1998 prepared by Kleinfelder (formerly S E A Consultants, Inc.) summarizes subsurface investigations (installation of soil borings B-1, B-2/MW-1, B-3/MW-3, B-4, and B-5) conducted in September and October 1998, as well as the collection of a New Street Pump Station effluent well sample. The memorandum documented that lead, petroleum hydrocarbons, SVOCs, and VOCs were detected in soil in excess of RCS-1 standards in 1998 in the New Street area. In addition, VOCs, SVOCs, and total metals were detected in groundwater above applicable MCP RC-GW-1 standards. The memorandum concluded that some soil displaced during construction would have to be disposed as hazardous waste due to lead concentrations and that the source of contamination was associated with the former landfill. Based on soil analytical data presented in the October 1998 memorandum, lead concentrations in borings B-1, B-2, and B-4 exceed the reuse requirements for lined and unlined

Massachusetts landfills presented in Table 1 of MassDEP Policy # COMM-97-001, and soil samples from B-1 and B-2 exceeded the TCLP limit of 5 mg/L. The October 1998 memorandum is included in Appendix B.

On September 26, 2014, five soil borings (NS-1 through NS-5) were advanced by Carr-Dee Corporation of Medford, Massachusetts under supervision of Kleinfelder. Borings NS-2 and NS-3 were completed as monitoring wells to depths of 12 feet below grade surface (bgs) and 15 feet bgs, respectively. Boring NS-1 was located within the parking lot of 22-48 New Street. Boring NS-2 was located near the abandoned pump station within a permeant easement. Borings NS-3, NS-4, and NS-5 were located within the New Street ROW. Soil was screened using a PID during subsurface investigations. Fill, including brick fragments, asphalt, and pieces of wood, was identified in boring NS-1 to a depth of 14 feet bgs. An asphalt odor was noted in boring NS-1 from 5 – 7 feet bgs and PID readings ranged from non-detect to 16.0 ppmv. Fill, including brick and asphalt fragments, was identified in boring NS-2 to a depth of 6.5 feet bgs. A petroleum odor was identified from 2.5 – 6.5 feet bgs in NS-2 and oil was noted in soil at a depth of 5 – 6.5 feet bgs. PID readings in boring NS-2 ranged from 1.0 ppmv to 474 ppmv. Fill, including brick and asphalt, was identified in boring NS-3, NS-4, and NS-5 to depths of 7 feet bgs, 6.5 feet bgs, and 12 feet bgs, respectively. PID readings ranged from 0.2 ppmv to 3.7 ppmv, non-detect to 6.5 ppmv, and 1.8 ppmv to 85 ppmv in borings NS-3, NS-4, and NS-5, respectively. Refer to Figure 3 for boring locations. Soil samples were generally not collected from borings for chemical analysis because extensive historical analytical data were available to document site conditions. Because of the potential for RCRA toxicity characteristic, as encountered at nearby sites and in the Project area, samples from borings NS-4 and NS-5 were analyzed for total lead.

On May 5, 2015 through May 11, 2015, test pits (TP-101 through TP-108, TP-110 through TP-123, and TP-125 through TP-134) were excavated within the project area in the New Street Right of Way and in Danehy Park by Cambridge DPW Contractor Mattuchio Construction and observed by Kleinfelder. The locations of the test pits were within the limits of waste material associated with the Old City Dump. The purpose of the work was to identify the cap construction materials and thickness to support preparation of the Landfill Modification Permit, and to assess waste disposal characteristics of the material to be excavated. Test pit locations and observations are provided in Appendix D.

Solid waste materials including plastic fragments and bottles, cardboard and paper, glass, brick, wood fragments, metal and ceramic fragments, concrete, and larger items, including a mattress and shopping cart, were encountered below the clay cap and below the New Street pavement.

Samples were collected and analyzed to assess the MCP reporting status and disposal options for excess excavated soil. Four composite soil samples were submitted to ConTest Analytical of East Longmeadow, MA for analysis for TPH by U.S. EPA Method 8100M; RCRA 8 metals; VOCs by U.S. EPA Method 8260B; SVOCs by U.S. EPA Method 8270D; PCBs by U.S. EPA Method 8082, conductivity by Method 9050A, pH, flashpoint, and reactivity. Samples New St TP-101/105 and New St TP-108/116 were collected as composite samples from the solid waste encountered within these test pit locations, while New St TP-114/117 and New St TP-102/132 represent clay cap materials collected above the solid waste. TCLP analysis was performed for compounds which were detected above the RCRA "Rule of 20". Test pit Soil sample results are tabulated in Table 3.

5.4.2 Soil Analytical Results

Samples from borings NS-4 and NS-5 were analyzed for total lead. Lead concentrations in the two samples were 76 mg/kg and 34 mg/L, respectively, well below the RCS-1 standards and the RCRA "Rule of 20".

Based on test pit data, VOCs were not detected at or above reporting limits consistent with MCP RCS-1 with the exception of sec-butylbenzene, for which no RCS-1 standard has been promulgated, in sample New St TP-108/116, and 1,4-dichlorobenzene in sample New St TP-102/132, at below RCS-1 limits.

PAHs including acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, 2-methylnaphthalene, naphthalene and/or pyrene were detected above laboratory reporting limits in all submitted samples. Benzo(a)pyrene was detected above RCS-1 in all samples analyzed, with additional PAHs detected above RCS-1 in sample NW ST TP 102/132. Additionally, bis(2-ethylhexyl)phthalate was detected in samples New St TP-108/116 and New St TP-102/132, and dibenzofuran was detected above laboratory reporting limits in samples New St TP-114/117 and New Street TP 102/132, but below RCS-1 Concentrations. Other SVOCs were not detected at

or above laboratory reporting limits; these reporting limits were elevated in samples New St TP-101/105 and New St TP-102/132.

TPH was detected in all samples submitted, ranging from 220 – 1800 mg/kg. TPH was detected in samples New St TP-101/105 and New St TP-102/132 at above RCS-1 criteria.

Aroclors 1242 and 1254 were detected in sample New St TP-108/116 at 1.0 mg/kg and 0.3 mg/kg respectively, with total PCBs detected above RCS-1 criteria (1.3 mg/kg).

The metals arsenic, barium, cadmium, chromium, mercury and/or silver were detected in the submitted samples at concentrations below MCP RCS-1 criteria. Lead was detected at greater than RCS-1 concentrations in samples New St TP-101/105 and New St TP-102/132. Based on the exceedance of the RCRA rule of 20, samples New St TP-101/105, New St TP-114/117 and New St TP-102/132 were analyzed for toxicity characteristic leaching procedure (TCLP). sample New St TP-101/105 had a concentration of 53 mg/l, exceeding the TCLP limit of 5 mg/L.

5.4.3 Groundwater Analytical Results

Kleinfelder reviewed the 2011 and 2012 landfill monitoring reports prepared by CDM-Smith and provided by the CDPW, particularly the results for the landfill perimeter monitoring well GW-2, located north of the Evolve Fitness Center (52 New Street). This well has been sampled and analyzed on a biannual basis since the early 1990s. The analytical data from this well show a pattern consistent with landfill leachate and indicate reducing conditions. Dissolved iron was present at concentrations above United States Environmental Protection Agency (USEPA) freshwater criteria while dissolved oxygen had been detected at concentrations below USEPA freshwater criteria. Total dissolved solids, dissolved manganese, and dissolved sodium were detected well above drinking water maximum contaminant limits (MCLs), however these constituents do not have freshwater criteria. Freshwater criteria would become applicable if groundwater similar to that encountered in GW-2 enters the storm drain system. Secondary effects include toxicity to freshwater life, formation of iron floc when exposed to the atmosphere, and effects of floc formation on aquatic plant life.

Following pumping operation on February 1, 2013, a water sample was collected from the abandoned pump station and analyzed for MWRA discharge permit parameters and additional inorganics. The data indicates that the water profile is very similar to groundwater from the landfill perimeter monitoring well GW-2. While the water meets MWRA sewer discharge permit

limits for organic and inorganic concentrations, the data and observations of sludge in the former New Street Pump Station indicate that the iron levels may result in turbidity that may be unacceptable for discharge to MWRA sewers. Refer to Appendix C for data collected on January 5, 2012, June 1, 2012, and December 13, 2012 from GW-2 and data collected in February 2013 from the abandoned pump station.

5.4.4 Landfill Gas

On July 17, 2014, MWH was inspecting catch basins in the immediate vicinity of the New Street Stormwater Pump Station. Elevated readings of 9 ppm hydrogen sulfide and 14% LEL were measured in catch basins D38CBN1517 (the abandoned pump station) and D38CBN1519 near the New Street Pump Station located at 22-48 New Street (catch basins are locations are provided in Appendix E). The findings were attributed to gas migration from the Old City Dump and reported to MassDEP in October 2014; however a separate RTN was not assigned. On October 22, 2014, CDM monitored the five catch basins and one manhole in the immediate vicinity of the New Street Stormwater Pump Station. No gases were detected during the October 22, 2014 event. Further monitoring will be conducted under the guidelines of the DEP Solid Waste Division.

5.5 SUMMARY OF ENVIRONMENTAL ASSESSMENT OF URAM AREA

Both Concord Lane and New Street project areas have a similar history of filling, both of clay pits and low-lying areas. The materials released or disposed of were not documented, but based on observations made during multiple MCP site investigations, a variety of waste materials were encountered and can be expected in any area of the project during the subsurface portion of the work. Soil or groundwater impacted by or containing these materials may be identified as potentially RCRA listed or characteristic wastes, requiring additional limits on transport and storage. Soil or groundwater may also be impacted by petroleum releases. Landfill gas has been documented in subsurface structures at levels exceeding the 10% lower explosive limit in the project area in New Street and in the permanent easement.

6. OBJECTIVES

The objectives of this URAM are to:

- Conduct the utility installations in a manner that will be protective of worker and public health;
- Manage OHM-impacted soils excavated to allow for utility construction and installation;
- Manage surplus soils in accordance with MassDEP and other applicable regulations and policies; and
- Manage OHM-impacted groundwater encountered during excavation, if required.

7. URAM PLAN

This URAM Plan has been prepared in accordance with 310 CMR 40.0460 to serve as written notification to MassDEP that the City of Cambridge, Massachusetts intends to implement a URAM. Work at the site will be performed in accordance with all applicable federal, state, and local regulations, including, but not limited to the MCP, local ordinances, and Occupational Safety and Health Administration regulations (including, but not limited to, 29 CFR 1910.1000, 29 CFR 1926, and CFR 1910.120), and other applicable state and federal regulations regarding health and safety.

7.1 SOIL MANAGEMENT

Soil will be excavated to limits as required to install or replace piping or roadway materials in the project area. The Contractor shall reuse, recycle or dispose of all excess soil resulting from excavation activities in accordance with federal, state and local regulations. Contaminated soil and groundwater are anticipated to be encountered primarily during subsurface work rather than surface work.

On-Site Soil Reuse

In general, untreated excavated soil from the Project area will be reused on site as backfill on the project in the area from which it came to the extent that it is geotechnically suitable and consistent with Project plans.

Off-Site Soil Disposal

Excess soil that is not potential RCRA characteristic waste or listed waste will be tested and reused or recycled in state or out of state facilities in conformance with the regulations of Massachusetts and of the receiving facility's state.

Soil Stabilization

Based on the reported results from Kleinfelder's investigations, nearby MCP sites, and the history of uncontrolled filling of clay pits in the area, ash or debris deposits may be encountered that have the potential for having the RCRA hazardous characteristic for lead or other metals. Such conditions may be encountered anywhere within the Project.

Soil that cannot be reused in its source location may be precharacterized in situ and stabilized in situ, if it is found to be characteristically hazardous for lead or other metals.

Alternatively, soil that cannot be reused in its source location may be kept within the limits of the area of contamination in a secure area pending soil characterization. Soils shall be placed on an impervious liner, bermed and covered. One or more samples representing the soil will be collected and characterized for disposal.

Excess soil that exceeds TCLP limits will be stabilized on-site to render the material characteristically non-hazardous avoid generating RCRA hazardous waste. Stabilization will consist of mixing the soil with a stabilization chemical that immobilizes the lead. Various stabilization chemicals are available. The stabilization chemical and quantity used will be determined based on treatability testing of the soil.

Stabilization will occur within the limits of the area of contamination, considered to be the project area. Soil that has been found to be characteristically hazardous will not be removed from the area of contamination until it has been tested and verified that the characteristic has been removed. Representative soil samples will be collected for laboratory chemical analysis for TCLP lead and/or other applicable metals following application and mixing of the stabilization product. Stabilization and sampling will be repeated, if needed, until sample analyses indicate that the soil is no longer a RCRA characteristic waste. Treated soils will then be removed and managed as non-hazardous waste as described below.

Treated soil will be reused as cover material at in-state lined landfills to the extent possible. Soil that exceeds the in-state limit for cover material at lined landfills will be transported to an out of state landfill for disposal.

RCRA Hazardous Waste Management-Solvents

Soil removed from the permanent easement within 22-48 New Street and containing detectable concentrations of CVOCs may be a RCRA listed or characteristic waste and will be managed as described below.

CVOC-impacted soil, if encountered in the permanent easement is likely related to solvent releases from the MCP-listed site at 23 Bay State Road and will be subject to disposal as RCRA F-listed hazardous waste. The contamination would be considered a listed waste, based on the documented detection of chlorobenzenes, PCE and TCE during site investigations at the site in the late 1990s and known source as spent solvents used in degreasing. Project soils with detectable concentrations of listed wastes will become generated listed wastes, once removed from the limits of the area of contamination, and may not be temporarily stored off-site in a non-RCRA facility or replaced in the excavation.

For soil with concentrations of solvents below MCP Method 1 S-1/GW-1 criteria, a “contained-in determination” may be performed in accordance with DEP guidance to document that such soil and/or groundwater are not classified as a listed RCRA Waste. Following DEP approval, these soils may be managed as nonhazardous soils.

Based on concentrations of VC detected in soils from the site, there is a potential that excavated soils could also be characteristically toxic hazardous wastes, once removed from the limits of the area of contamination. As with listed wastes, they may not be temporarily stored off-site in a non-RCRA facility or replaced in the excavation unless the toxicity characteristic is removed through treatment.

Depending on the volume of excess soil to be generated, listed or characteristic waste soils may be transported and disposed of as a RCRA hazardous waste. Soils that have been determined to be RCRA F-listed wastes or untreated characteristic wastes will be transported under a RCRA Hazardous Waste Manifest to a RCRA Waste Disposal Facility.

7.2 GROUNDWATER MANAGEMENT

Wherever possible, groundwater will be managed on site by recharge into the excavation. A settling or fractionation tank may be used to hold collected groundwater for slow recharge at its approximate point of origin if the infiltration rate does not allow direct infiltration. Groundwater may also be treated and released in accordance with an MWRA discharge permit, in which case a groundwater sample will be collected and analyzed prior to permit application by the Contractor..

CVOC-impacted groundwater, associated with the MCP-listed site at 23 Bay State Road, may be present in the permanent easement. Direct infiltration without use of a container must be performed within the boundaries of the disposal site. Water that is tested and found to have detectable concentrations of CVOCs that are listed wastes, or have detections of VC that exceed the toxicity characteristic, will be considered generated once they are placed into a container or fractionation tank and will require either on-site treatment prior to infiltration or discharge, or off-site treatment and disposal as a hazardous waste.

8. HEALTH AND SAFETY PLAN

The Contractor will prepare a Health and Safety Plan (HASP), and dust, vapor, and odor control plan documenting methods to protect workers and the public during construction activities at the site. This section of the URAM Plan outlines Contractor general requirements. All on-site personnel will be made aware of the potential hazards.

An air monitoring program will be implemented protect worker safety and public health from the potential generation of vapors and dust or explosive conditions during excavation and soil management. Air monitoring will be conducted within the breathing zone and at the limits of the exclusion zone.

Water or additives such as calcium chloride will be used to control the potential for airborne dust. The soil will be adequately wetted to control dust generation during excavation and before being either backfilled into the excavation(s) or loaded into roll-off containers or trucks. The containers/trucks will be covered and decontaminated prior to leaving the site. Nuisance odors, potentially explosive vapors, and/or elevated PID readings will be addressed utilizing foam vapor suppression.

At the conclusion of each working day stockpiled soil that is contaminated or observed to be impacted will be securely covered with polyethylene sheeting; open trenches will be securely covered with steel plates to minimize the potential for off-hours release of vapors and/or disturbance of soils.

9. IMPLEMENTATION SCHEDULE & REPORTING

Excavation and soil management work associated with the Project will begin in June 2015 and is anticipated to continue through approximately September 2015.

The first URAM status report will be submitted within 120 days of the initiation of URAM activities. Status reports will be submitted every six months thereafter until a URAM completion report is submitted.

A URAM Completion Report will be prepared and submitted to MassDEP within 60 days of completion of URAM activities. The report will document activities at the site and will include:

- A succinct summary of information and data pertaining to the discovery, location and evaluation of encountered contamination, and of all response actions undertaken;
- Documentation on the management of Remediation Waste, Remedial Additives and/or Remedial Wastewater managed at the site; and
- Details on any proposed or ongoing active or passive remedial systems that will remain in place at the site.

10. PERMITS

The Project work is being performed under City of Cambridge Excavation Permits.

Based on preliminary plans including street reconstruction, the disturbed area may exceed 1 acre. If so, the Contractor will prepare a Stormwater Pollution Prevention Plan and will apply for a National Pollutant Discharge Elimination System Construction General Permit for stormwater discharges. If dewatering and off-site discharge are required, the Contractor will obtain an MWRA permit for groundwater discharges.

A portion of the New Street surface work will be conducted within the historical limits of the Old City Dump, and will comply with a Landfill Modification Permit (application currently being prepared) and any conditions imposed by MassDEP Bureau of Waste Prevention in its approval.

11. PUBLIC NOTIFICATION

Utility workers entering the trenches and/or excavations within the area associated with the presence of CVOCs may use Level B or C personal protective equipment. In accordance with the requirements of 310 CMR 40.1403, at least three days prior to start of work in the area, notification shall be provided to the Board of Health and the Chief Municipal Officer of the intended use of respirators.

12. LIMITATIONS

This work was performed in a manner consistent with the level of care and skill of environmental practice generally accepted in the State of Massachusetts and ordinarily exercised by other members of the profession under similar conditions, at the date these services are provided. Our conclusions, opinions, and recommendations are based on a limited number of observations and data. It is possible that conditions could vary between or beyond the data evaluated. Kleinfelder makes no other representation, guarantee, or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

Figures

Legend

- ★ Methane detected in catch basin above 10% LEL
- ⋯ Location of potential environmental concern
- ⊞ Approximate limits of Old City Dump
- ▭ Limit of Work



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

Figure 1
Concord Lane - New Street

URAM LOCATION PLAN



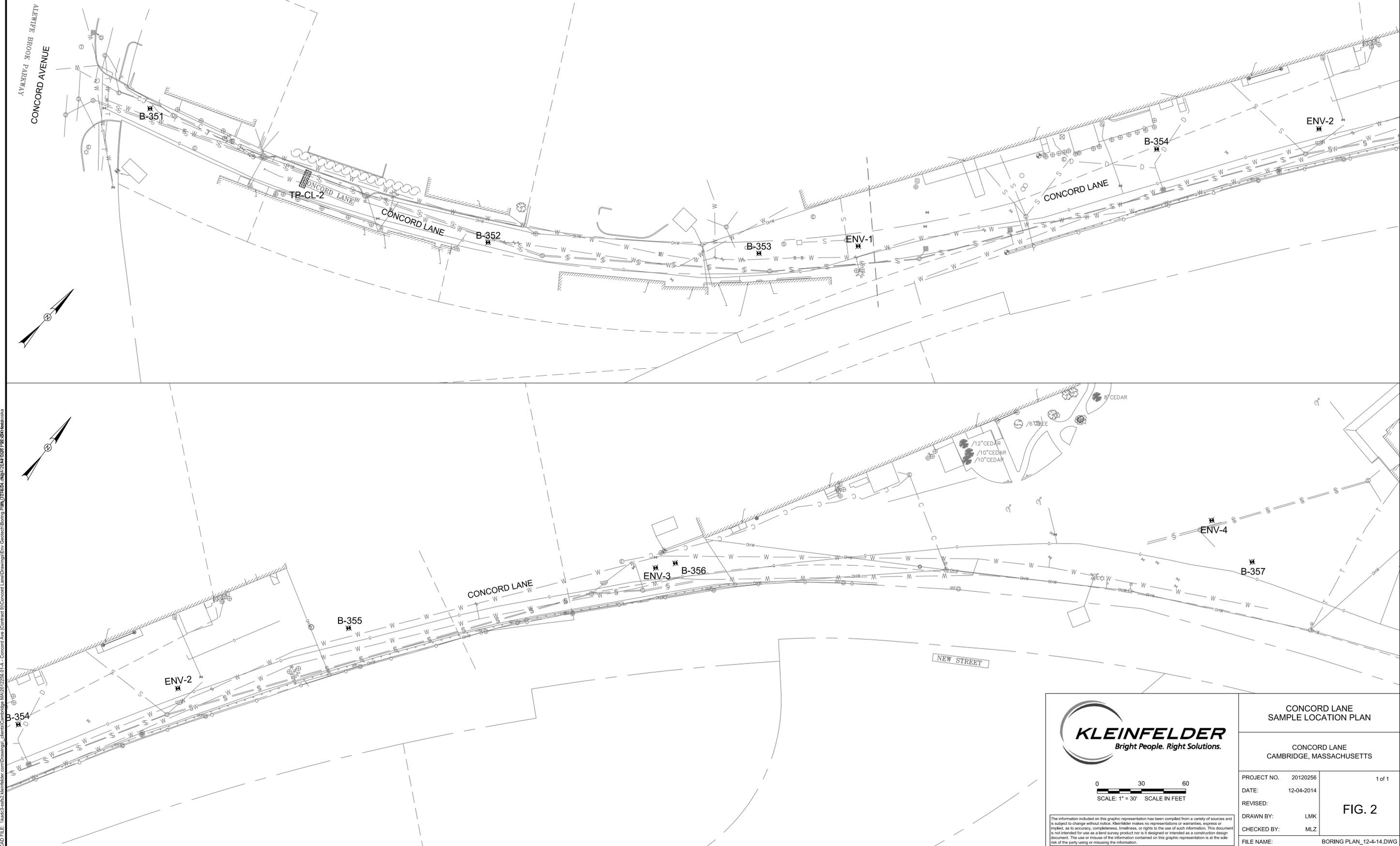
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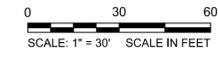
2/9/2015

LEGEND

✕ TEST BORING LOCATION



CAD FILE: \\s02\k1\k1\Drawings\12-4-14\Concord Ave (Contract 9)\Concord Lane\Drawings\Env\Concord Boring PLAN.DWG, R18/01/14/0387 P80-BWA/Andreas



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CONCORD LANE SAMPLE LOCATION PLAN

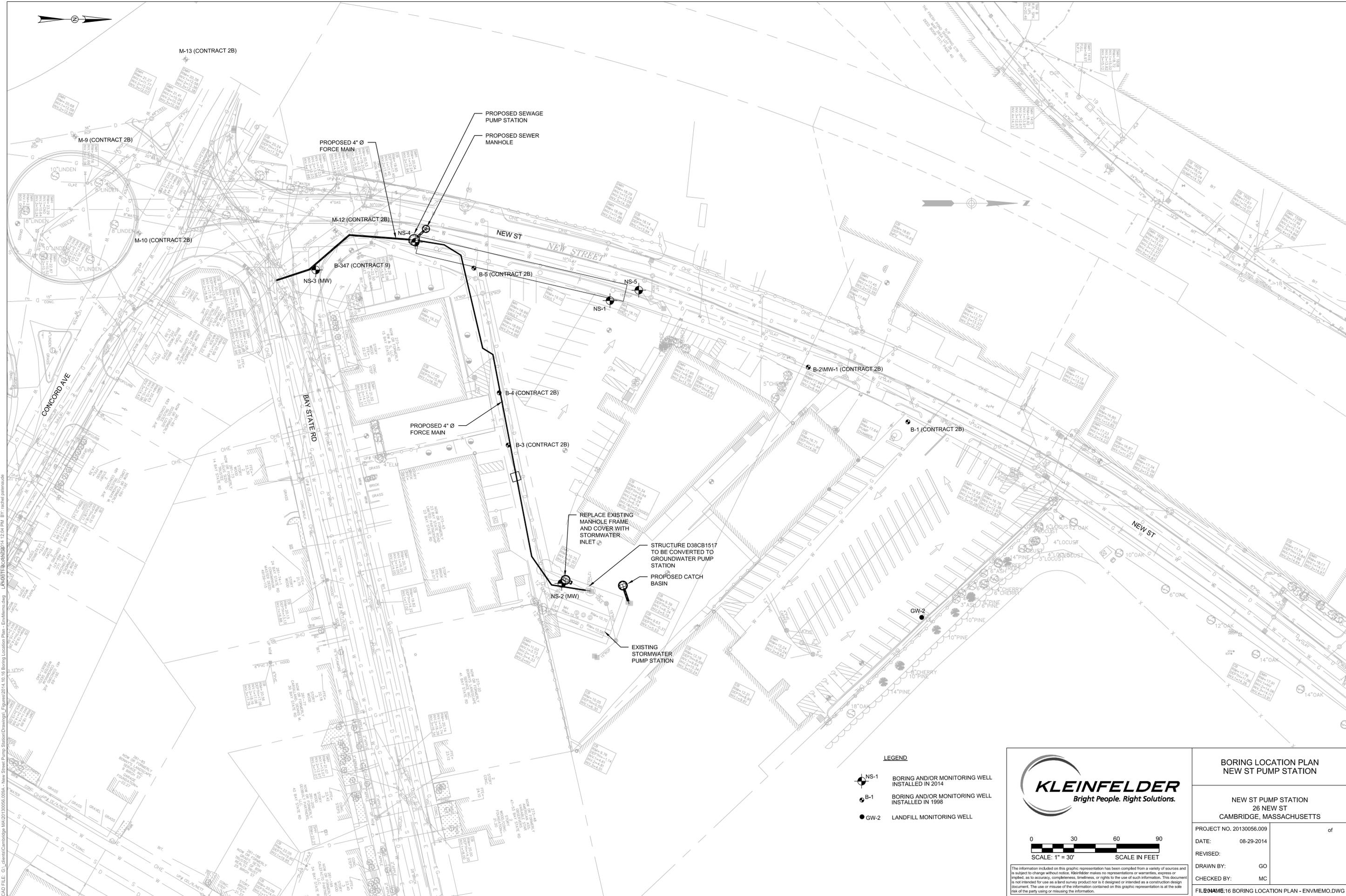
CONCORD LANE CAMBRIDGE, MASSACHUSETTS

PROJECT NO. 20120256
 DATE: 12-04-2014
 REVISED:
 DRAWN BY: LMK
 CHECKED BY: MLZ

1 of 1

FIG. 2

FILE NAME: BORING_PLAN_12-4-14.DWG



CAD FILE: G:_client\Cambridge_MA\20130505_000A - New Street Pump Station Drawings - Figures\2014_10_16 Boring Location Plan - EnvMemo.dwg
 L:\PROJECTS\2014\10_16 Boring Location Plan - EnvMemo.dwg
 12:04 PM, BY: rcedel.patananda

- LEGEND**
- NS-1 BORING AND/OR MONITORING WELL INSTALLED IN 2014
 - B-1 BORING AND/OR MONITORING WELL INSTALLED IN 1998
 - GW-2 LANDFILL MONITORING WELL

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Bright People. Right Solutions.

SCALE: 1" = 30'

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BORING LOCATION PLAN NEW ST PUMP STATION	
NEW ST PUMP STATION 26 NEW ST CAMBRIDGE, MASSACHUSETTS	
PROJECT NO. 20130056.009	of
DATE: 08-29-2014	
REVISED:	
DRAWN BY: GO	
CHECKED BY: MC	
FILE NAME: 16 BORING LOCATION PLAN - ENVMEMO.DWG	

Tables

Table 1
Soil Analytical Data
Concord Lane
Cambridge, MA

Parameter	Reportable Concentrations (RCs)		SAMPLING LOCATION									
	RCS-1	RCS-2	B-351a 0.5-6	B-351a 2-4	B-351 (2-6ft)	B-352b 0.5-7	B-352b 4-6	B-352 (0.5-6ft)	ENV-1 1-7	ENV-1 4-5	ENV-1 (1-7ft)	ENV-2 1-8
Sampling Date			7/30/2014 8:20:00 AM	7/30/2014 8:15:00 AM	11/19/2014 10:00:00 AM	7/30/2014 11:20:00 AM	7/30/2014 11:15:00 AM	11/19/2014 10:00:00 AM	9/29/2014 11:00:00 AM	9/29/2014 11:00:00 AM	11/19/2014 10:00:00 AM	9/29/2014 9:00:00 AM
Sample Depth			0.5-6 Feet	2-4 Feet	2-6 Feet	0.5-7 Feet	4-6 Feet	0.5-6 Feet	1-7 Feet	4-5 Feet	1-7 Feet	1-8 Feet
SM 2540G (% Wt)												
% Solids	~	~	90.0	NT	86.6	89.3	NT	84.2	83.4	83.4	84.6	86.3
SM18-20 2510B (µmhos/cm)												
SPECIFIC CONDUCTANCE	~	~	22	NT	NT	14	NT	NT	NT	NT	NT	NT
SW-846 1010 (°F)												
FLASHPOINT	~	~	> 212 °F	NT	NT	> 212 °F	NT	NT	> 212 °F	NT	NT	> 212 °F
SW-846 6010C (mg/Kg dry) Metals Digestion												
ARSENIC	20	20	13	NT	NT	3.2	NT	NT	5.3	NT	NT	5.6
BARIUM	1000	3000	60	NT	NT	49	NT	NT	70	NT	NT	94
CADMIUM	70	100	0.58	NT	NT	0.38	NT	NT	0.36	NT	NT	0.83
CHROMIUM	100	200	17	NT	NT	15	NT	NT	5.7	NT	NT	12
LEAD	200	600	140	NT	1600	120	NT	220	110	NT	76	57
SELENIUM	400	700	ND (5.3)	NT	NT	ND (5.5)	NT	NT	ND (6.0)	NT	NT	ND (5.9)
SILVER	100	200	ND (0.53)	NT	NT	ND (0.55)	NT	NT	ND (0.60)	NT	NT	ND (0.59)
TCLP Lead	~	~	0.11	NT	5.7	0.31	NT	1.3	1.1	NT	NT	NT
SW-846 7471B (mg/Kg dry) Metals Digestion												
MERCURY	20	30	0.19	NT	NT	0.094	NT	NT	0.059	NT	NT	0.12
SW-846 8015C (mg/Kg dry)												
TPH	1000	3000	590	NT	NT	660	NT	NT	470	NT	NT	1200
SW-846 8082A (mg/Kg dry)												
All PCBs were ND except as noted below												
PCB 1260	1	4	ND (0.11)	NT	NT	ND (0.11)	NT	NT	ND (0.12)	NT	NT	1.0
SW-846 8260C (mg/Kg wet)												
All VOCs were ND except as noted below												
BENZENE	2	200	NT	0.0020	NT	NT	ND (0.0012)	NT	NT	ND (0.0021)	NT	NT
NAPHTHALENE	4	20	NT	ND (0.0093)	NT	NT	ND (0.0059)	NT	NT	ND (0.011)	NT	NT
SW-846 8270D (mg/Kg dry)												
All SVOCs were ND except as noted below												
ACENAPHTHENE	4	3000	0.55	NT	NT	ND (0.38)	NT	NT	ND (0.20)	NT	NT	3.8
ANTHRACENE	1000	3000	0.88	NT	NT	0.39	NT	NT	0.31	NT	NT	8.2
BENZO(A)ANTHRACENE	7	40	3.2	NT	NT	1.7	NT	NT	1.5	NT	NT	11
BENZO(A)PYRENE	2	7	3.0	NT	NT	1.7	NT	NT	1.5	NT	NT	9.9
BENZO(B)FLUORANTHENE	7	40	3.4	NT	NT	2.0	NT	NT	1.8	NT	NT	11
BENZO(G,H,I)PERYLENE	1000	3000	1.9	NT	NT	0.92	NT	NT	0.70	NT	NT	7.2
BENZO(K)FLUORANTHENE	70	400	1.3	NT	NT	0.80	NT	NT	0.66	NT	NT	4.0
BIS(2-ETHYLHEXYL)PHTHALATE	90	600	ND (0.75)	NT	NT	ND (0.75)	NT	NT	ND (0.40)	NT	NT	0.47
CHRYSENE	70	400	3.2	NT	NT	1.7	NT	NT	1.7	NT	NT	10
DIBENZ(A,H)ANTHRACENE	0.7	4	0.61	NT	NT	ND (0.38)	NT	NT	ND (0.20)	NT	NT	1.2
DIBENZOFURAN	100	1000	ND (0.75)	NT	NT	ND (0.75)	NT	NT	ND (0.40)	NT	NT	7.2
FLUORANTHENE	1000	3000	4.6	NT	NT	2.6	NT	NT	2.8	NT	NT	30
FLUORENE	1000	3000	0.49	NT	NT	ND (0.38)	NT	NT	ND (0.20)	NT	NT	6.5
INDENO(1,2,3-CD)PYRENE	7	40	2.1	NT	NT	1.0	NT	NT	0.72	NT	NT	6.5
2-METHYLNAPHTHALENE	0.7	80	ND (0.38)	NT	NT	ND (0.38)	NT	NT	ND (0.20)	NT	NT	5.4
NAPHTHALENE	4	20	0.56	NT	NT	ND (0.38)	NT	NT	0.26	NT	NT	18
PHENANTHRENE	10	1000	3.2	NT	NT	1.3	NT	NT	1.3	NT	NT	41
PYRENE	1000	3000	5.2	NT	NT	2.4	NT	NT	3.4	NT	NT	30
SW-846 9014 (mg/Kg)												
REACTIVE CYANIDE	~	~	ND (3.9)	NT	NT	ND (4.0)	NT	NT	ND (4.0)	NT	NT	ND (3.9)
SW-846 9030A (mg/Kg)												
REACTIVE SULFIDE	~	~	ND (19)	NT	NT	ND (20)	NT	NT	ND (20)	NT	NT	ND (20)
SW-846 9045C (pH Units)												
PH	~	~	8.1	NT	NT	8.6	NT	NT	8.1	NT	NT	8.7
NOTES:												
1. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.												
2. ND = Not detected above the lab reporting limits shown in parenthesis.												
3. NT = Not tested.												
4. ~ = No Method 1 Standard or UCL available												
5. Shaded and bolded values meet or exceed the MCP Reportable Concentrations (RCs).												
6. Italicized values exceed the Toxicity Characteristic standard.												

Table 1
Soil Analytical Data
Concord Lane
Cambridge, MA

Parameter	Reportable Concentrations (RCs)		Reportable Concentrations (RCs)								
	RCS-1	RCS-2	ENV-2 S2 2.5-4.5	ENV-2 S3 5-5.9	ENV-2 (1-6ft)	ENV-3 0.5-8	ENV-3 S-2 2.5-4.5	ENV-3 (0.5-6.5ft)	ENV-4 1-9	ENV-4 (0.5-6ft)	TP-CL-2 (1-4ft)
Sampling Date			9/29/2014 9:00:00 AM	9/29/2014 9:00:00 AM	11/19/2014 10:00:00 AM	9/29/2014 8:30:00 AM	9/29/2014 8:00:00 AM	11/19/2014 10:00:00 AM	9/29/2014 12:00:00 PM	11/19/2014 10:00:00 AM	11/19/2014 10:00:00 AM
Sample Depth			2.5-4.5 Feet	5-5.9 Feet	1-6 Feet	0.5-8 Feet	2.5-4.5 Feet	0.5-6.5 Feet	1-9 Feet	0.5-6 Feet	1-4 Feet
SM 2540G (% Wt)											
% Solids	~	~	86.3	86.3	88.6	84.8	84.8	87.4	80.4	69.9	77.8
SM18-20 2510B (µmhos/cm)											
SPECIFIC CONDUCTANCE	~	~	NT	NT		NT	NT	NT	NT	NT	NT
SW-846 1010 (°F)											
FLASHPOINT	~	~	NT	NT	NT	> 212 °F	NT	NT	> 212 °F	NT	NT
SW-846 6010C (mg/Kg dry) Metals Digestion											
ARSENIC	20	20	NT	NT	NT	5.7	NT	NT	ND (3.3)	NT	NT
BARIUM	1000	3000	NT	NT	NT	51	NT	NT	77	NT	NT
CADMIUM	70	100	NT	NT	NT	0.48	NT	NT	0.69	NT	NT
CHROMIUM	100	200	NT	NT	NT	15	NT	NT	15	NT	NT
LEAD	200	600	NT	NT	91	270	NT	11	36	51	630
SELENIUM	400	700	NT	NT	NT	ND (5.6)	NT	NT	ND (6.6)	NT	NT
SILVER	100	200	NT	NT	NT	ND (0.56)	NT	NT	ND (0.66)	NT	NT
TCLP Lead	~	~	NT	NT	NT	0.0547	NT	NT	NT	NT	6.2
SW-846 7471B (mg/Kg dry) Metals Digestion											
MERCURY	20	30	NT	NT	NT	0.065	NT	NT	0.091	NT	NT
SW-846 8015C (mg/Kg dry)											
TPH	1000	3000	NT	NT	NT	780	NT	NT	3500	NT	NT
SW-846 8082A (mg/Kg dry)											
All PCBs were ND except as noted below											
PCB 1260	1	4	NT	NT	NT	ND (0.12)	NT	NT	ND (0.12)	NT	NT
SW-846 8260C (mg/Kg wet)											
All VOCs were ND except as noted below											
BENZENE	2	200	ND (0.0024)	ND (2.9) *	NT	NT	ND (0.0023)	NT	NT	NT	NT
NAPHTHALENE	4	20	ND (0.012)	99	NT	NT	ND (0.011)	NT	NT	NT	NT
SW-846 8270D (mg/Kg dry)											
All SVOCs were ND except as noted below											
ACENAPHTHENE	4	3000	NT	NT	NT	0.92	NT	NT	4.8	NT	NT
ANTHRACENE	1000	3000	NT	NT	NT	3.4	NT	NT	4.9	NT	NT
BENZO(A)ANTHRACENE	7	40	NT	NT	NT	7.7	NT	NT	9.3	NT	NT
BENZO(A)PYRENE	2	7	NT	NT	NT	6.7	NT	NT	7.1	NT	NT
BENZO(B)FLUORANTHENE	7	40	NT	NT	NT	7.4	NT	NT	9.1	NT	NT
BENZO(G,H,I)PERYLENE	1000	3000	NT	NT	NT	3.7	NT	NT	5.2	NT	NT
BENZO(K)FLUORANTHENE	70	400	NT	NT	NT	3.2	NT	NT	4.2	NT	NT
BIS(2-ETHYLHEXYL)PHTHALATE	90	600	NT	NT	NT	0.80	NT	NT	0.63	NT	NT
CHRYSENE	70	400	NT	NT	NT	7.6	NT	NT	9.4	NT	NT
DIBENZ(A,H)ANTHRACENE	0.7	4	NT	NT	NT	0.97	NT	NT	1.2	NT	NT
DIBENZOFURAN	100	1000	NT	NT	NT	0.43	NT	NT	2.2	NT	NT
FLUORANTHENE	1000	3000	NT	NT	NT	14	NT	NT	21	NT	NT
FLUORENE	1000	3000	NT	NT	NT	0.92	NT	NT	4.3	NT	NT
INDENO(1,2,3-CD)PYRENE	7	40	NT	NT	NT	3.7	NT	NT	4.8	NT	NT
2-METHYLNAPHTHALENE	0.7	80	NT	NT	NT	0.20	NT	NT	1.9	NT	NT
NAPHTHALENE	4	20	NT	NT	NT	0.28	NT	NT	3.1	NT	NT
PHENANTHRENE	10	1000	NT	NT	NT	8.1	NT	NT	27	NT	NT
PYRENE	1000	3000	NT	NT	NT	17	NT	NT	19	NT	NT
SW-846 9014 (mg/Kg)											
REACTIVE CYANIDE	~	~	NT	NT	NT	ND (3.9)	NT	NT	ND (4.0)	NT	NT
SW-846 9030A (mg/Kg)											
REACTIVE SULFIDE	~	~	NT	NT	NT	ND (20)	NT	NT	ND (20)	NT	NT
SW-846 9045C (pH Units)											
PH	~	~	NT	NT	NT	8.9	NT	NT	12	NT	NT
NOTES:											
1. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exce											
2. ND = Not detected above the lab reporting limits shown in parenthesis.											
3. NT = Not tested.											
4. ~ = No Method 1 Standard or UCL available											
5. Shaded and bolded values meet or exceed the MCP Reportable Concentrations (RCs).											
6. Italicized values exceed the Toxicity Characteristic standard.											

Table 2
Groundwater Analytical Data
Concord Lane
Cambridge, MA

Parameter	Reportable Concentrations (RCs)		MWRA DISCHARGE LIMITS	National Recommended Water Quality Criteria http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm	SAMPLING LOCATION				
	RCGW-1	RCGW-2			**	Aquatic Life Criteria (Chronic except as noted)	MW-351	MW-353	MW-355
Sampling Date					9/28/2014 8:15:00 AM	9/28/2014 9:15:00 AM	9/28/2014 10:30:00 AM	9/28/2014 11:50:00 AM	9/28/2014
Applicable RCs					RCGW-1	RCGW-2	RCGW-2	RCGW-2	--
EPA 624 VOCs (µg/L)			Each less than 1000, exc. as noted						
					ND	ND	ND	ND	ND
MADEP-EPH-04-1.1 (µg/L)									
C9-C18 ALIPHATICS	700	5000			ND (100)	ND (95)	ND (100)	ND (100)	NT
C19-C36 ALIPHATICS	14000	50000			ND (100)	ND (95)	ND (100)	ND (100)	NT
UNADJUSTED C11-C22 AROMATICS	-	-			ND (100)	320	110	170	NT
C11-C22 AROMATICS	200	5000			ND (100)	280	ND (100)	150	NT
MADEP-VPH-04-1.1 (µg/L)									
UNADJUSTED C5-C8 ALIPHATICS	-	-			ND (100)	ND (200)	ND (100)	ND (500)	NT
C5-C8 ALIPHATICS	300	3000			ND (100)	ND (200)	ND (100)	ND (500) *	NT
UNADJUSTED C9-C12 ALIPHATICS	-	-			ND (100)	ND (200)	ND (100)	ND (500)	NT
C9-C12 ALIPHATICS	700	5000			ND (100)	ND (200)	ND (100)	ND (500)	NT
C9-C10 AROMATICS	200	4000			ND (100)	ND (200)	ND (100)	ND (500) *	NT
SM18-20 4500 H B (pH Units)									
PH	-	-	5.5-12	6.5-9	7.6	12	7.4	12	NT
SW-846 6010C (ug/L) Metals Digestion									
Dissolved									
ANTIMONY	6	8000	10000		0.16	0.59	0.23	0.13	NT
ARSENIC	10	900	500	150	2.1	6.1	34.1	11.5	NT
BARIUM	2000	50000			305	700	222	118	NT
CADMIUM	4	4	100	0.25	<1.0	<1.0	<1.0	<1.0	NT
CHROMIUM	100	300	1000	74	0.58	0.64	0.43	1.1	NT
COPPER	10000	100000	1000		5.5	2.6	2.9	3.8	NT
IRON	-	-		1000	1.3	0.22	0.85	ND (0.050)	NT
LEAD	10	10	200	2.5	<1.0	<1.0	1.4	0.47	NT
MANGANESE	-	-	*		229	9.7	1720	55.8	NT
NICKEL	100	200	1000	52	4.4	25.6	10.3	41.4	NT
SELENIUM	50	100	5000	5	1.3	2.2	1.4	2.1	NT
SILVER	7	7	2000	3.2 (acute)	<1.0	<1.0	<1.0	<1.0	NT
ZINC	900	900	1000	120	4	1.7	3.3	1.5	NT
Total									
ANTIMONY	6	8000	10000		0.47	0.74	0.22	0.37	NT
ARSENIC	10	900	500	150	2.1	7.6	34.7	18.3	NT
BARIUM	2000	50000			421	811	245	97.2	NT
CADMIUM	4	4	100	0.25	<1.0	0.19	0.094	0.072	NT
CHROMIUM	100	300	1000	74	0.62	4.7	4.5	5.1	NT
COPPER	10000	100000	1000		6.1	9.6	8.9	8.2	NT
IRON	-	-		1000	3.2	2.6	3.1	2.2	NT
LEAD	10	10	200	2.5	1.1	33.1	4.5	2.8	NT
MANGANESE	-	-	*		250	61.5	2350	30.7	NT
NICKEL	100	200	1000	52	6.8	36.3	13.6	50.3	NT
SELENIUM	50	100	5000	5	0.56	1.8	0.66	2	NT
SILVER	7	7	2000	3.2 (acute)	<1.0	0.083	0.019	0.015	NT
ZINC	900	900	1000	120	6.3	21.3	12.6	9.6	NT
SW-846 7470A (mg/L) Metals Digestion									
MERCURY (total)	0.002	0.02	0.001	0.77	ND (0.00010)	0.00043	ND (0.00010)	ND (0.00010)	NT
MERCURY (dissolved)	0.002	0.02		0.77	ND (0.00010)	0.00043	ND (0.00010)	ND (0.00010)	NT
SW-846 8270D SOVCs(1) (µg/L)			Each less than 1000, exc. as noted						
All ND					NT	NT	ND	NT	NT
SW-846 8270D SVOCs (2) (µg/L)			Each less than 1000, exc. as noted						
PHENANTHRENE	40	10000	1		NT	NT	2.1	NT	NT
SW-846 8315A (µg/L)									
Formaldehyde	-	-	9000		NT	NT	ND (50)	NT	NT
SW-846 9014 (mg/L)									
CYANIDE	0.03	0.03	0.5	0.0052	NT	NT	ND (0.010)	NT	NT
NOTES:									
1. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.									
2. ND = Not detected above the lab reporting limits shown in parenthesis.									
3. NT = Not tested.									
4. - = No Method 1 Standard or UCL available									
5. Shaded values exceed the MCP Reportable Concentrations (RCs).									
6. Con-Test Laboratory is not responsible for the regulatory content, data comparisons with regulations, or decisions made based on data comparisons shown in this deliverable. Please notify us should you be aware of any regulatory information that may not be correct or that has changed.									
7. MWRA discharge limit for total EPH and VPH concentrations is 300,000 ug/L									
* No Substance causing noticeable turbidity or discoloration									
** prohibited: Groundwater, stormwater, surface water, roof or surface runoff,....subsurface drainage except as permitted									

Table 3 - Soil Analytical Results
New Street, Cambridge MA

Parameter	Reportable Concentrations (RCs)	SAMPLING LOCATION			
		RCS-1	NEW ST TP 101/105	NEW ST TP 108/116	NEW ST TP 114/117
Sampling Date		5/4/2015	5/8/2015	5/4/2015	5/11/2015
Soil material		Solid Waste	Solid Waste	Clay Cap	Clay Cap
SM 2540G (% Wt)					
% Solids	~	74.7	78.3	87.3	84.5
SM21-22 2510B Modified (µmhos/cm)					
SPECIFIC CONDUCTANCE	~	62	54	14	21
SW-846 1010 (°F)					
FLASHPOINT	~	> 212 °F	> 212 °F	> 212 °F	> 212 °F
SW-846 6010C (mg/Kg dry) Metals Digestion					
ARSENIC	20	6.9	9.5	ND (2.8)	ND (2.9)
BARIUM	1000	260	79	35	61
CADMIUM	70	1.4	1.5	ND (0.28)	0.48
CHROMIUM	100	18	27	20	16
LEAD	200	1900	150	24	220
SELENIUM	400	ND (6.2)	ND (6.5)	ND (5.6)	ND (5.8)
SILVER	100	2.7	ND (0.65)	ND (0.56)	ND (0.58)
SW-846 7471B (mg/Kg dry) Metals Digestion					
MERCURY	20	0.47	0.13	0.03	0.26
SW-846 6010C (mg/L) 1311 TCLP EXT					
LEAD		53	0.071	NT	0.98
SW-846 8082A (mg/Kg dry)					
PCB 1242	1	ND (0.13)	1.00	ND (0.11)	ND (0.11)
PCB 1254	1	ND (0.13)	0.33	ND (0.11)	ND (0.11)
SW-846 8100 Modified (mg/Kg dry)					
TPH	1000	1800	410	220	1500
SW-846 8260C (mg/Kg dry)					
SEC-BUTYLBENZENE	~	ND (0.0038)	0.0013	ND (0.0019)	ND (0.0023)
1,4-DICHLOROBENZENE	0.7	ND (0.0038)	ND (0.00093)	ND (0.0019)	0.0023
SW-846 8270D (mg/Kg dry)					
ACENAPHTHENE	4	0.97	0.48	0.92	2.2
ANTHRACENE	1000	1.3	1.1	2.4	4.2
BENZO(A)ANTHRACENE	7	3.1	2.4	3.9	7.7
BENZO(A)PYRENE	2	2.3	2.1	3.9	6.9
BENZO(B)FLUORANTHENE	7	3.5	2.5	4	9
BENZO(G,H,I)PERYLENE	1000	1	0.69	1.2	4.1
BENZO(K)FLUORANTHENE	70	1.3	1.2	1.7	3.5
BIS(2-ETHYLHEXYL)PHTHALATE	90	ND (1.8)	1.4	ND (0.39)	0.52
CHRYSENE	70	2.9	2.4	3.5	7.5
DIBENZ(A,H)ANTHRACENE	0.7	ND (0.91) *	ND (0.22)	0.23	1.1
DIBENZOFURAN	100	ND (1.8)	ND (0.43)	0.7	1.5
FLUORANTHENE	1000	7.3	4.7	8.7	17
FLUORENE	1000	1.1	0.54	0.59	2.4
INDENO(1,2,3-CD)PYRENE	7	0.96	0.72	1.2	4.2
2-METHYLNAPHTHALENE	0.7	ND (0.91) *	ND (0.22)	ND (0.19)	0.59
NAPHTHALENE	4	ND (0.91)	0.33	0.22	15
PHENANTHRENE	10	6.1	5	6.8	15
PYRENE	1000	8.5	6.5	9.5	15
SW-846 9014 (mg/Kg)					
REACTIVE CYANIDE	~	ND (4.0)	ND (3.9)	ND (3.9)	ND (3.9)
SW-846 9030A (mg/Kg)					
REACTIVE SULFIDE	~	ND (20)	ND (20)	ND (20)	ND (19)
SW-846 9045C (pH Units)					
PH	~	7.7	8.0	9.0	7.7
NOTES:					
1. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.					
2. ND = Not detected above the lab reporting limits shown in parenthesis.					
3. NT = Not tested.					
4. ~ = No Method 1 Standard Available					
5. Shaded values exceed the MCP Reportable Concentrations (RCs).					

Appendix A – BWSC Form 119



Massachusetts Department of Environmental Protection

eDEP Transaction Copy

Here is the file you requested for your records.

To retain a copy of this file you must save and/or print.

Username: **MARTHAZIRBEL**

Transaction ID: **755427**

Document: **BWSC119 URAM Transmittal Form**

Size of File: **163.61K**

Status of Transaction: **In Process**

Date and Time Created: **7/6/2015:11:06:41 AM**

Note: This file only includes forms that were part of your transaction as of the date and time indicated above. If you need a more current copy of your transaction, return to eDEP and select to "Download a Copy" from the Current Submittals page.



UTILITY-RELATED ABATEMENT MEASURE (URAM)
TRANSMITTAL FORM

Release Tracking Number

Pursuant to 310 CMR 40.0462 - 0465 (Subpart D)

3 - 32992

A. SITE LOCATION:

1. Site Name/Location Aid:

2. Street Address:

3. City/Town:

4. ZIP Code:

5. Check here if the disposal site that is the source of the release is Tier Classified. Check the current Tier Classification Category.

a. Tier I

b. Tier ID

c. Tier II

B. THIS FORM IS BEING USED TO: (check all that apply)

1. Provide an **Initial Utility-related Abatement Measure (URAM) Notification or Confirmation of an Oral URAM Notification.**
(Sections D & E are not required)

a. Check here if a URAM Notification was already made orally to DEP.

b. List Date of Oral Notification:
(mm/dd/yyyy)

Is the URAM limited to the excavation and/or handling of not more than 100 cubic yards of soil contaminated by Oil, or not more than 20 cubic yards of soil contaminated either by a Hazardous Material or a mixture of a Hazardous Material and Oil?

c. Yes d. No If No, provide LSP Name and License Number: i. LSP #:

ii. First Name:

iii. Last Name:

2. Submit a **URAM Status Report.**

3. Submit a **Remedial Monitoring Report**, as Form BWSC119A. (This report can only be submitted through eDEP, concurrent with a URAM Status Report.)

a. Type of Report: (check one) i. Initial Report ii. Interim Report iii. Final Report

b. Number of Remedial Systems and/or Monitoring Programs:

A separate BWSC119A, URAM Remedial Monitoring Report, must be filled out for each Remedial System and/or Monitoring Program addressed by this transmittal form.

4. Submit a **URAM Completion Statement.**

Is the URAM limited to the excavation and/or handling of not more than 100 cubic yards of soil contaminated by Oil, or not more than 20 cubic yards of soil contaminated either by a Hazardous Material or a mixture of a Hazardous Material and Oil?

a. Yes, Section E is not required b. No



UTILITY-RELATED ABATEMENT MEASURE (URAM)
TRANSMITTAL FORM

Release Tracking Number

Pursuant to 310 CMR 40.0462 - 0465 (Subpart D)

3 - 32992

B. THIS FORM IS BEING USED TO: (cont.)

- 5. Submit a **Revised URAM Completion Statement.**

Is the URAM limited to the excavation and/or handling of not more than 100 cubic yards of soil contaminated by Oil, or not more than 20 cubic yards of soil contaminated either by a Hazardous Material or a mixture of a Hazardous Material and Oil?

- a. Yes, Section E is not required b. No

(All sections of this transmittal form must be filled out unless otherwise noted above)

C. RELEASE OR THREAT OF RELEASE CONDITIONS THAT WARRANT URAM:

1. Identify Location Type: (check all that apply) a. Public Right of Way b. Utility Easement c. Private Property

2. Identify Utility Type: (check all that apply) a. Drainage b. Electric c. Natural Gas

- d. Sanitary/Combined Sewerage e. Steam Lines f. Telecommunications g. Telephone

- h. Water i. Other Specify:

3. Source of the Release or TOR: (check all that apply) a. Transformer b. Fuel Tank c. Pipe

- d. OHM Delivery e. AST f. Drums g. Tanker Truck h. Hose i. Line

- j. UST Describe: k. Vehicle l. Boat/Vessel

- m. Unknown n. Other:

4. Identify Oils and Hazardous Materials Released: (check all that apply)

- a. Oils b. Chlorinated Solvents c. Heavy Metals

- d. Others Specify:

D. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply, for volumes list cumulative amounts)

- | | |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <input type="checkbox"/> 1. Assessment and/or Monitoring Only | <input type="checkbox"/> 2. Temporary Covers or Caps |
| <input type="checkbox"/> 3. Deployment of Absorbent or Containment Materials | <input type="checkbox"/> 4. Temporary Water Supplies |
| <input type="checkbox"/> 5. Structure Venting System | <input type="checkbox"/> 6. Temporary Evacuation or Relocation of Residents |
| <input type="checkbox"/> 7. Product or NAPL Recovery | <input type="checkbox"/> 8. Fencing and Sign Posting |
| <input type="checkbox"/> 9. Groundwater Treatment Systems | <input type="checkbox"/> 10. Soil Vapor Extraction |
| <input type="checkbox"/> 11. Bioremediation | <input type="checkbox"/> 12. Air Sparging |



UTILITY-RELATED ABATEMENT MEASURE (URAM)
TRANSMITTAL FORM

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Pursuant to 310 CMR 40.0462 - 0465 (Subpart D)

3 - 32992

D. DESCRIPTION OF RESPONSE ACTIONS (cont.): (check all that apply, for volumes list cumulative amounts)

13. Excavation of Contaminated Soils

a. Re-use, Recycling or Treatment

i. On Site

Estimated volume in cubic yards

ii. Off Site

Estimated volume in cubic yards

ii. Receiving Facility:

Town:

State:

iib. Receiving Facility:

Town:

State:

iii. Describe:

b. Store

i. On Site

Estimated volume in cubic yards

ii. Off Site

Estimated volume in cubic yards

ii. Receiving Facility:

Town:

State:

iib. Receiving Facility:

Town:

State:

c. Landfill

i. Cover

Estimated volume in cubic yards

Receiving Facility:

Town:

State:

ii. Disposal

Estimated volume in cubic yards

Receiving Facility:

Town:

State:

14. Removal of Drums, Tanks or Containers:

a. Describe Quantity and Amount:

b. Receiving Facility:

Town:

State:

c. Receiving Facility:

Town:

State:

15. Removal of Other Contaminated Media:

a. Specify Type and Volume:

b. Receiving Facility:

Town:

State:

c. Receiving Facility:

Town:

State:

16. Other Response Actions:

Describe:

17. Use of Innovative Technologies:

Describe:



UTILITY-RELATED ABATEMENT MEASURE (URAM)
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3 - 32992

E. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR 4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> if Section B of this form indicates that a **Utility-Related Abatement Measure Status Report** and/or a **Remedial Monitoring Report** is being submitted, the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B of this form indicates that a **Utility-Related Abatement Measure Completion Statement** is being submitted, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply (ies) with the identified provisions of all orders, permits, and approvals identified in this submittal.

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP #:

2. First Name:

3. Last Name:

4. Telephone:

5. Ext.:

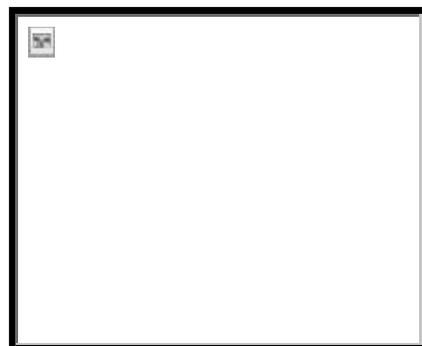
6. Email:

7. Signature:

8. Date:

(mm/dd/yyyy)

9. LSP Stamp:





UTILITY-RELATED ABATEMENT MEASURE (URAM)
TRANSMITTAL FORM

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F. PERSON UNDERTAKING URAM:

1. Check all that apply: a. change in contact name b. change of address c. change in the person undertaking response actions

2. Name of Organization: CITY OF CAMBRIDGE

3. Contact First Name: KATHERINE 4. Last Name: WATKINS

5. Street: 147 HAMPSHIRE ST 6. Title: CITY ENGINEER

7. City/Town: CAMBRIDGE 8. State: MA 9. ZIP Code: 021390000

10. Telephone: 617-349-4800 11. Ext.: 12. Email:

G. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON UNDERTAKING URAM:

Check here to change relationship

1. RP or PRP a. Owner b. Operator c. Generator d. Transporter

e. Other RP or PRP Specify:

2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

4. Any Other Person Undertaking URAM Specify Relationship: MUNICIPAL UTILITY

H. REQUIRED ATTACHMENT AND SUBMITTALS:

1. Check here if any Remediation Waste, generated as a result of this URAM, will be stored, treated, managed, recycled or reused at the site following submission of the URAM Completion Statement. If this box is checked, you must submit one of the following plans, along with the appropriate transmittal form.

a. A Release Abatement Measure (RAM) Plan (BWSC106) b. Phase IV Remedy Implementation Plan (BWSC108)

2. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

3. Check here if the property owner was NOT contacted prior to initiation of the URAM. If this is the case, you must attach an explanation of why the owner was not contacted, including the date and time when contact ultimately occurred.

4. Check here if this URAM will occur in connection with the construction of new public utilities. If this is the case, document the nature and extent of encountered contamination, the scope and expense of necessary mitigation and the benefits and limitations of project alternatives.

5. Check here if any non-updatable information provided on this form is incorrect, e.g. Release Address/Location Aid. Send corrections to BWSC.eDEP@state.ma.us.

6. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.



UTILITY-RELATED ABATEMENT MEASURE (URAM)
TRANSMITTAL FORM

Release Tracking Number

Pursuant to 310 CMR 40.0462 - 0465 (Subpart D)

3 - 32992

I. CERTIFICATION OF PERSON UNDERTAKING URAM:

1. I, , attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By:
Signature

3. Title:

4. For:
(Name of person or entity recorded in Section F)

5. Date:
(mm/dd/yyyy)

6. Check here if the address of the person providing certification is different from address recorded in Section F.

7. Street:

8. City/Town: 9. State: 10. ZIP Code:

11. Telephone: 12. Ext.: 13. Email:

YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

Date Stamp (DEP USE ONLY:)



Appendix B – 1998 Environmental Review Memo-New Street



MEMORANDUM

DATE: OCTOBER 23, 1998
TO: JOHN STRUZZIERY, SEA CONSULTANTS
FROM: MICHAEL FLYNN; JENNIFER KEHOE; JOY LAPOINTE
CC: PAUL MILLET; VINCE SPADA
SUBJECT: REVIEW OF DATABASE SEARCH AND
MADEP FILE REVIEW; SITE RECONNAISSANCE AND
SUBSURFACE INVESTIGATION
NEW STREET AREA

S E A REF. NO. 98400.23A

INTRODUCTION

As part of Preliminary Design Activities for the installation of a precast concrete vault and a precast concrete pump station structure to replace the existing pump station located along New Street, S E A evaluated the proposed site for potential oil and hazardous material impacts. The evaluation included site reconnaissance and a limited subsurface investigation program as well as a review of the database search and Massachusetts Department of Environmental Protection (MADEP) file review associated with Contract 2.

FINDINGS

Database Search and MADEP File Review

According to the database search the landfill located to the northwestern side of New Street is listed as a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) Site, a State Site, and a Solid Waste Landfill. A review of the associated MADEP files described the landfill, the Old City Dump, as having been an actively mined clay pit between 1847 and 1953 and then utilized as an unlined landfill between 1946 and 1971. Hazardous Substance List Compounds have been detected in groundwater samples obtained from monitoring wells around the site.

Site Reconnaissance

S E A field engineer Joy LaPointe conducted a site reconnaissance of the New Street Area on 25 and 28 September 1998. Ms. LaPointe observed that the properties along New Street were primarily commercial and retail facilities. The Boston and Maine Railroad runs parallel to the



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street on the western side and a capped landfill is located on the northeastern side of New Street. The grass cover on the landfill appeared to be in good condition; there was no evidence of exposed solid waste material; several persons were utilizing the athletic facilities located on the top of the landfill. The grassy area located between New Street and the landfill also appeared to be in good condition; with no evidence of distressed vegetation. During the site reconnaissance, Ms. LaPointe located several automotive repair shops and an electrical transformer yard in the area. No overt indications of gross contamination, improperly stored hazardous materials, or evidence of on-going releases were observed; however, a faint oil/gasoline odor was detected by Ms. LaPointe in the area of the existing Pump Station.

Subsurface Investigation

Subsurface explorations along New Street consisted of five (5) test borings, designated B-1 through B-5, and the installation of two (2) groundwater monitoring wells, performed by New Hampshire Boring, Inc. of Londonderry, New Hampshire. The monitoring wells, identified as MW-1 and MW-2, were installed in borings B-2 and B-3 respectively. The location of the test borings are shown on the attached Site Plan. Boring logs prepared by New Hampshire Boring are also attached.

An Organic Vapor Analyzer (OVA) was used to screen the headspace of all the soil samples collected. The headspace readings ranged from 0.0 to 147.2 parts per million. Typically, the soil samples with the highest headspace readings were submitted for laboratory analysis.

Soil samples were submitted to Alpha Analytical Laboratories, Inc. of Westborough, Massachusetts. The samples were analyzed for Extractable Petroleum Hydrocarbons (EPH), Volatile Petroleum Hydrocarbons (VPH), Polychlorinated Biphenyls (PCBs), Semi-volatile Organic Compounds (SVOCs), Priority Pollutant 13 Metals (PP13), and total solids. Total Lead results which exceeded 100 milligrams per Kilogram were analyzed by the Toxicity Characteristic Leaching Procedure (TCLP). Analytical results were compared to the Massachusetts Contingency Plan (MCP) S-1 reportable concentrations and the TCLP Lead results were compared to the Threshold Limit according to the Code of Federal Registry, 40 CFR 261. Constituents which exceeded the MCP Reportable Concentrations (RCS-1) included Petroleum Hydrocarbons, Polyaromatic Hydrocarbons (PAHs), Semi-volatile Organic Compounds (SVOCs), and Lead. A summary of the laboratory results is presented in Attachment 4.

The groundwater monitoring wells, MW-1 and MW-2, were sampled on 9 October 1998 by an S E A field engineer. The samples were submitted to Alpha Analytical Laboratories, Inc. and analyzed for Semi-volatile Organic Compounds (SVOCs), Total Petroleum Hydrocarbons (TPH),



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Total Metals, and Volatile Organic Compounds (VOCs). A duplicate sample was also submitted from MW-1 and analyzed for Total Metals. Analytical results were compared to the Massachusetts Contingency Plan (MCP) GW-1 reportable concentrations and to the Massachusetts Water Resources Authority (MWRA) discharge limits. Constituents which exceeded the MCP Reportable Concentrations (RC-GW1) included Semi-volatile Organic Compounds (SVOCs), Volatile Petroleum Hydrocarbons (VPH) and Metals. Semi-volatile Organic Compounds (SVOCs) and various Metals were reported above MWRA limits. A summary of the results are located in the attached table. It is important to note that the groundwater samples collected were analyzed for Total metals as opposed to dissolved metals. The groundwater samples were reported to contain appreciable quantities of silt and therefore may not represent a reportable release condition under the MCP.

One (1) sample was collected 25 September 1998 from the pump station effluent well. The sample was collected as representative of the groundwater which enters the existing pump station. The sample was collected and analyzed by Alpha Analytical Laboratories, Inc. The analysis parameters included Semi-volatile Organic Compounds (SVOCs), Total Petroleum Hydrocarbons (TPH), and Volatile Organic Compounds (VOCs).

The sample results of the effluent discharge were used as representative of existing discharge conditions and representative of probable discharge conditions following completion of the new pump station. A previously collected sample from the pump station well has also been included in the evaluation of effluent water quality. Based on the results, the effluent water quality does not exceed MWRA discharge limitations (Refer to the attached summary table). Assuming that the current effluent water quality is not adversely effected by construction activities or new design features then pretreatment of the effluent is not expected. MWRA should be consulted for the applicability of a discharge permit to the effluent and to determine what if any routine monitoring the MWRA may impose upon the discharge.

CONCLUSIONS

Based on the findings presented above;

- Hazardous materials (i.e. lead, petroleum hydrocarbons, semi-volatile organic compounds, volatile organic compounds, and polyaromatic hydrocarbons) have been detected in the soil in the New Street Area. Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOCs), Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, and Zinc were reported in the groundwater above the applicable MCP reportable concentration (RC-GW1) however due to appreciable quantities of silt in the sample the results may not be



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representative of actual groundwater conditions (i.e. the contaminants are adsorbed onto the silt and not present in the dissolved phase of the groundwater). Phenanthrene, Copper, Lead, Mercury, and Zinc were detected in the groundwater monitoring wells above MWRA discharge limits. The effluent sample did not contain any exceedences of MWRA discharge limitations. The source of the contamination appears to be associated with the former landfill.

- As a result of the ground water sampling results, pretreatment of construction dewatering wastes will be required during construction activities; however based on the results of the effluent sample results and assuming that the new pump station will perform substantially similar to the existing pump station (in regards to groundwater collection and discharge) then effluent treatment does not appear to be warranted.
- Analytical results indicate that some of the soil which is displaced during construction activities will have to be disposed as Hazardous waste due to lead toxicity.
- Several potential sources of Oil and Hazardous materials have been identified in the New Street Area, including automotive repair garages and the adjacent landfill, which may impact construction activities.

RECOMMENDATIONS

S E A recommends incorporating soil and groundwater management specifications into the Contract specifications appropriate to address the contamination encountered. A URAM plan prepared in accordance with the MCP needs to be drafted and submitted to the DEP, prior to initiating construction activities in this area.

Since construction dewatering wastes may need to be discharged to an MWRA storm collection system or sewer, an MWRA Temporary Construction Dewatering Permit is required. Based on the analytical results pretreatment of the discharge will be required. SEA recommends preparing the permit application as soon as practical, whereas the MWRA may take up to 90 days to review and issue the permit. SEA recommends incorporating particulate filter and granular activated carbon treatment units to the construction design specifications. SEA recommends carrying approximately \$50,000 in the design budget and an additional \$10,000 for analytical test requirements. Actual costs may vary significantly depending upon the extent of dewatering required during construction.

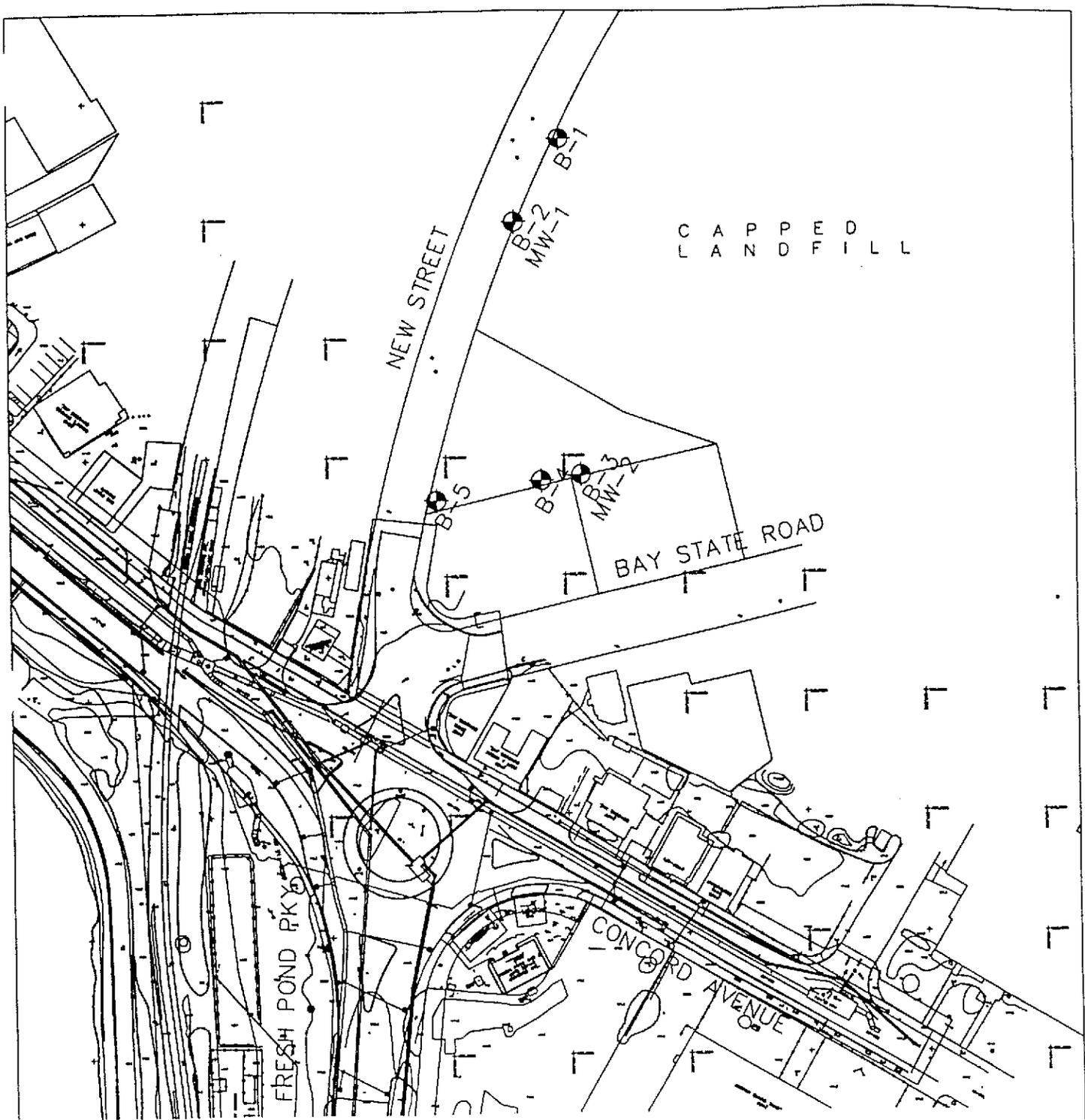


MEMORANDUM

SEA recommends carrying an additional 10% of Design and construction costs to address OHM or assume that soil which is displaced by the pipe plus 10% of volume excavated will need to be disposed as RCRA Hazardous waste due to lead toxicity. Excavation and disposal costs may vary but typically will range between \$200 - \$400/ton, depending upon the volume of material, soil density, contaminants present in the soil and other considerations. The excavation and disposal cost presented above does not include LSP services or oversight during construction.

ATTACHMENT 1

Site Map



C A P P E D
L A N D F I L L

NEW STREET

BAY STATE ROAD

FRESH POND PKY

CONCORD AVENUE

SEWER AND DRAINAGE
IMPROVEMENTS NEW STREET

 SEA Consultants, Inc.
Scientists/Engineers/Architects

ATTACHMENT 2

**Boring Logs
Monitoring Well Installation Logs
Cross-section View of Borings**

NEW HAMPSHIRE BORING INC.
P.O. BOX 165
DERRY NH 03038

TEL: -603-437-1610

Boring #: B-1 Project: CAMBRIDGE SEWER Project # :
Project Address: NEW STREET City: CAMBRIDGE State: MA Zip:
Date Start: 09/25/98 Date End: 09/25/98 Location: See Plan

Casing Sampler Casing Sampler
TYPE : H-S-A S/S SIZE: 4 1/4 in. I.D. 1 3/8 in. I.D.
HAMMER: 140 lbs. FALL: 30 in.

GROUNDWATER OBSERVATION
DATE DEPTH CASING STABILIZATION PER.
09/25/98 10' OUT Upon Completion

DP.	S./#	DEPTH	PEN	REC	BLOWS/6"	ST/CH	SAMPLE DESCRIPTION
-	S-1	0' -2'	24"	24"	4-27-54-	40	S-1: 3" TOPSOIL
-	S-2	2' -4'	24"	14"	22-24		3" Brown, poorly graded medium sand with gravel.
-					24-40		18" dark brown medium dense, poorly graded fine medium sand with gravel, little silt, dry.
5'	S-3	4' -6'	24"	20"	41-18		S-2: Dark brown-black dense, poorly graded fine medium sand, some coarse sand, some coarse gravel, trace coal, brick.
-					10-19		S-3: Similar to above, trace coal, glass. -FILL-
-	S-4	6' -8'	24"	8"	14-18		S-4: Black, dense, poorly graded, fine medium sand, some glass, brick, moist.
-					10-19		S-5: Similar to previous, loose, wet, strong petroleum odor.
-	S-5	8' -10'	24"	6"	14-23		S-6: Black, loose poorly graded fine medium sand, wet petroleum odor, sheen on water.
-					18-16		S-7: 3" black, dense poorly graded medium sand, brick wet.
-							13" wood.
15'	S-6	15' -17'	24"	1"	6-6		S-8: Wood, medium dense, wet.
-					5-6		S-9: Black, medium dense, poorly graded fine medium sand, ash, brick, wet.
-							Terminated boring at 32'.
20'	S-7	20' -22'	24"	16"	15-31		
-					21-20		
-							
25'	S-8	25' -27'	24"	6"	4-6		
-					11-18		
-							
30'	S-9	30' -32'	24"	12"	10-7		
-					9-18		

DRILLER: G. TWOMBLY HELPER: S. COOLEY INSPECTOR: J. LAPOINTE

MARKS:

S/#: SAMPLE # PEN: PENETRATION REC: RECOVERY ST/CH: STRATA CHANGE

NEW HAMPSHIRE BORING INC.
P.O. BOX 165
DERRY NH 03038

TEL:-603-437-1610

Boring #: B-2 Project: CAMBRIDGE SEWER Project # :
Project Address: NEW STREET City: CAMBRIDGE State: MA Zip:
Date Start: 09/25/98 Date End: 09/25/98 Location: See Plan

Casing Sampler Casing Sampler
TYPE : H-S-A S/S SIZE: 4 1/4 in. I.D. 1 3/8 in. I.D.
HAMMER: 140 lbs. FALL: 30 in.

GROUNDWATER OBSERVATION
DATE 09/25/98 DEPTH 8' CASING OUT STABILIZATION PER. Upon Completion

DP.	S./#	DEPTH	PEN	REC	BLOWS/6"	ST/CH	SAMPLE DESCRIPTION
-	S-1	0' -2'	24"	20"	4-12-19-	38	S-1: 4" topsoil
-	S-2	2' -4'	24"	14"	37-46		4" brown, poorly graded clean medium sand.
-	S-3	4' -6'	24"	20"	50-72		12" black, medium dense, graded fine coarse sand, gravel, little silt, dry.
-	S-4	6' -8'	24"	12"	33-56		S-2: Black, very dense, poorly graded fine medium sand with silt and gravel, trace brick
-	S-5	8' -8'	0"	0"	50/0"		S-3: Black, very dense, well graded, fine coarse sand, ash, brick, moist.
-	S-6	10' -12'	24"	10"	5-7		S-4: Similar to pervious, moist.
-	S-7	12' -14'	24"	10"	5-7		S-5: No recovery, augers grinding.
-	S-8	15' -17'	24"	16"	5-8		S-6: 4" grey clay, with brick
15'	S-8	15' -17'	24"	16"	11-15		2" wood
-	S-9	20' -22'	24"	8"	29-36		4" black, medium dense poorly graded, fine medium sand and brick wood, wet.
20'	S-9	20' -22'	24"	8"	26-22		S-7: Black medium dense, well graded sand, brick wet.
-	S-10	25' -27'	24"	13"	4-4		S-8: Similar to previous, wet.
-	S-10	25' -27'	24"	13"	8-4		S-9: Black, very dense, well graded sand with gravel, brick, wet. FILL
25'	S-10	25' -27'	24"	13"	8-4		23' -24' difficult drilling
-	S-11	30' -32'	24"	24"	4-6		S-10: Dark black, grey medium dense poorly graded fine medum sand with silt, organic wood, moist.
30'	S-11	30' -32'	24"	24"	7-7		S-11: Grey, stiff silty clay, plastic, moist.
-							Terminated boring at 32'

DRILLER: G. TWOMBLY HELPER: S. MATHERS INSPECTOR: J. LAPOINTE

MARKS: Installed well at 28'
10' screen, 8' riser pipe, 1 road box.

S/#: SAMPLE # PEN: PENETRATION REC: RECOVERY ST/CH: STRATA CHANGE

NEW HAMPSHIRE BORING INC.
P.O. BOX 165
DERRY NH 03038

TEL: -603-437-1610

Boring #: B-3 Project: CAMBRIDGE SEWER Project # :
Project Address: NEW STREET City: CAMBRIDGE State: MA Zip:
Date Start: 09/28/98 Date End: 09/28/98 Location: See Plan

Casing TYPE: H-S-A Sampler S/S Casing SIZE: 4 1/4 in. I.D. Sampler 1 3/8 in. I.D.
HAMMER: 140 lbs. FALL: 30 in.

GROUNDWATER OBSERVATION

DATE: 09/28/98 DEPTH: 4' CASING OUT STABILIZATION PER. Upon Completion

DP.	S./#	DEPTH	PEN	REC	BLOWS/6"	ST/CH	SAMPLE DESCRIPTION
-	S-1	0'-2'	8"	4"	21-50/2"		3" ASPHALT
-	S-2	2'-4'	24"	6"	19-93		S-1: Fine to coarse sand and gravel, some brick and cobbles.
-					23-19		S-2: Fine to coarse sand, some gravel, trace of glass.
-	S-3	4'-6'	24"	3"	5-4		S-3: Fine to medium sand, some coarse sand and gravel, trace of silt.
5'					2-7		
-							
-	S-4	10'-12'	24"	13"	3-4		S-4: Fine to coarse sand with gravel, trace of silt, brick and ash.
-					7-14		
-							
15'	S-5	15'-17'	24"	16"	43-49		S-5: Silty clay.
-					54-3		
-							
20'	S-6	20'-22'	24"	24"	10-2		S-6: Clay
-					2-2		
-							
25'	S-7	25'-27'	24"	24"	WOR-2		S-7: Clay
-					2-2		
-						27'	Terminated boring at 27'
-							
30'							

DRILLER: S.Clavette HELPER: S.Mathers INSPECTOR: J.LaPointe

MARKS:

S/#: SAMPLE # PEN: PENETRATION REC: RECOVERY ST/CH: STRATA CHANGE

NEW HAMPSHIRE BORING INC.
P.O. BOX 165
DERRY NH 03038

TEL: -603-437-1610

Boring #: B-4 Project: CAMBRIDGE SEWER Project # :
Project Address: NEW STREET City: CAMBRIDGE State: MA Zip:
Date Start: 09/28/98 Date End: 09/28/98 Location: See Plan

Casing TYPE : H-S-A Hammer: Sampler S/S 140 lbs. Casing SIZE: 4 1/4 in. I.D. FALL: Sampler 1 3/8 in. I.D. 30 in.

GROUNDWATER OBSERVATION
DATE 09/28/98 DEPTH 4' CASING OUT STABILIZATION PER. Upon Completion

DP.	S./#	DEPTH	PEN	REC	BLOWS/6"	ST/CH	SAMPLE DESCRIPTION
-	S-1	0' -2'	24"	14"	12-31 39-42		3" ASPHALT S-1: Fine to coarse sand, some gravel.
-	S-2	4' -6'	24"	12"	4-2 2-3		S-2: Fine to coarse sand, some gravel and brick.
-	S-3	10' -12'	24"	10"	5-3 3-4		S-3: Fine to coarse sand, some brick and ash.
15'	S-4	15' -17'	24"	8"	3-3 9-4		S-4: Fine to coarse sand with brick.
20'	S-5	20' -22'	24"	18"	7-4 3-3		S-5: Silt and clay.
25'	S-6	25' -27'	24"	24"	1-1 2-2		S-6: Clay.
-						27'	Terminated boring at 27'

DRILLER: S.Clavette HELPER: S. Mathers INSPECTOR: J.LaPointe

MARKS:

S/#: SAMPLE # PEN: PENETRATION REC: RECOVERY ST/CH: STRATA CHANGE

NEW HAMPSHIRE BORING INC.
P.O. BOX 165
DERRY NH 03038

TEL: -603-437-1510

Boring #: B-5 Project: CAMBRIDGE SEWER Project # :
Project Address: NEW STREET City: CAMBRIDGE State: MA Zip:
Date Start: 09/28/98 Date End: 09/28/98 Location: See Plan

Casing Sampler Casing Sampler
TYPE : H-S-A S/S SIZE: 4 1/4 in. I.D. 1 3/8 in. I.D.
HAMMER: 140 lbs. FALL: 30 in.

GROUNDWATER OBSERVATION

DATE 09/28/98 DEPTH 9' CASING OUT STABILIZATION PER. Upon Completion

DP.	S./#	DEPTH	PEN	REC	BLOWS/6"	ST/CH	SAMPLE DESCRIPTION
-	S-1	3"-2'3"	24"	12"	10-6-6-8		3" ASPHALT
-	S-2	2'-4'	24"	12"	10-10		S-1: Black, medium dense, poorly graded medium sand with silt, gravel, moist.
-					8-9		S-2: Similar to previous with brick, trace wood, moist.
5'	S-3	5'-7'	24"	12"	4-4		S-3: Similar to previous, loose moist. -FILL-
-					3-6		
-	S-4	10'-12'	24"	16"	3-2		S-4: 6": Dark gray, poorly graded fine sand, trace brick, wet.
-					6-5		4": Grey, poorly graded fine sand with silt, trace organics.
-							6": Grey, silty clay, trace organics, plastic, wet.
15'	S-5	15'-17'	24"	24"	2-2		S-5: Grey, medium stiff, silty clay, plastic, wet.
-					3-3		
-	S-6	20'-22'	24"	24"	20-22		S-6: Similar to previous, wet.
20'						22'	Terminated boring at 22'.
-							
-							
25'							
-							
-							
30'							
-							

DRILLER: S. CLAVETTE HELPER: S. MATHERS INSPECTOR: J. LAPOINTE

MARKS:

S/#: SAMPLE # PEN: PENETRATION REC: RECOVERY ST/CH: STRATA CHANGE



SEA Consultants Inc.
Engineers / Architects

Cambridge, MA. Glastonbury, CT. Londonderry, NH.

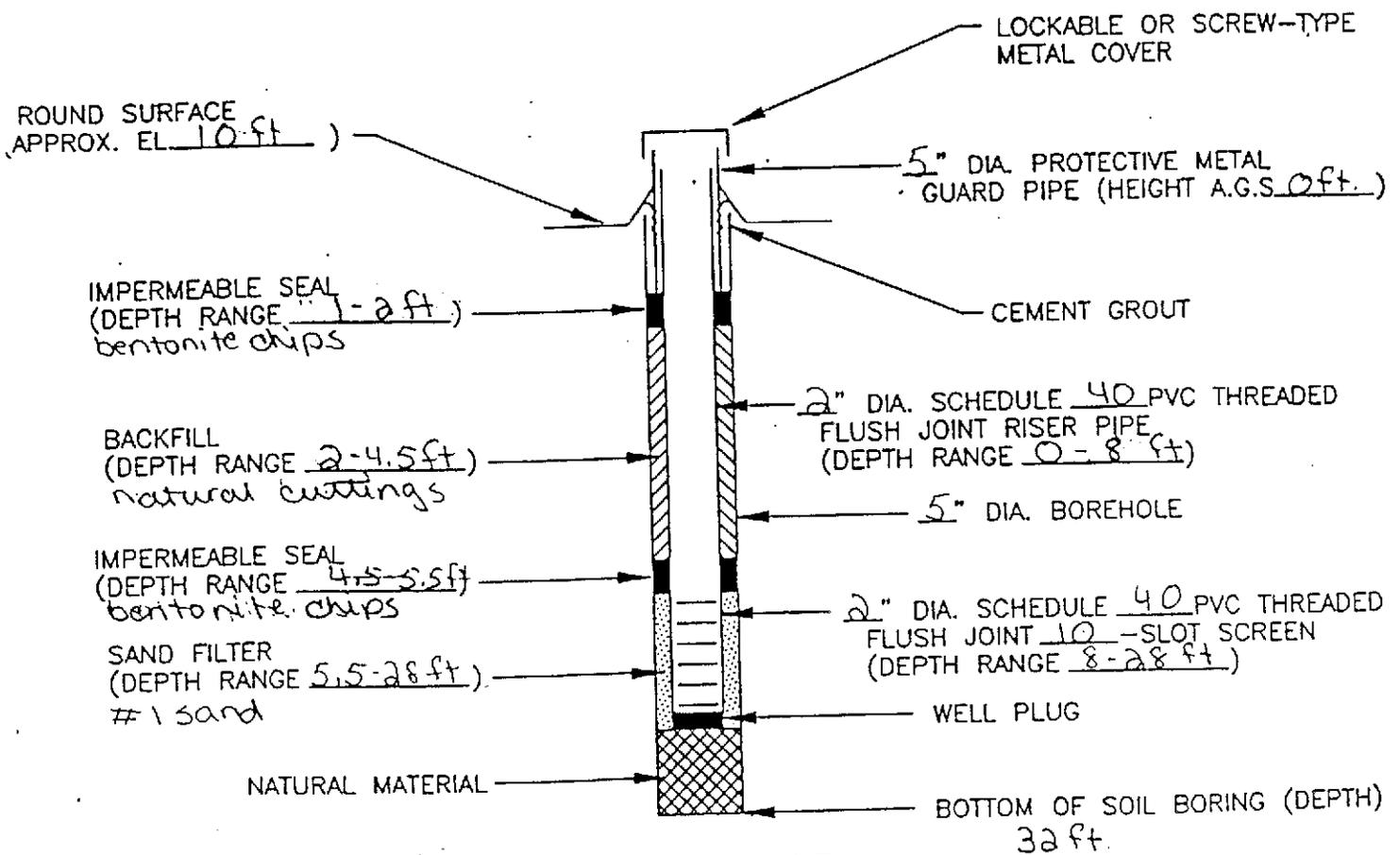
DRILLING CONTRACTOR: New Hampshire Boring
FOREMAN: Gary Trombly
METHOD: Hollow Stem Auger

SEA GEOLOGIST/ENGINEER: Joy LaPointe

GROUNDWATER LEVEL: 10 ft.
DATE: 9-25-98
TIME: 0930
FEET: 10 ft.
METHOD: probe
DATUM: 0 ft. (approximate)

MONITORING WELL NO: MW-1 (B-2)
JOB NO: 98400.23A CLIENT: Cambridge
LOCATION: New Street Cambridge
DATE:
START: 9-25-98 FINISH: 9-25-98

SOIL SAMPLES TAKEN:
YES X NO _____
EQUIPMENT CLEANING:
YES X NO _____
METHOD: steam
MATERIAL TO FACILITATE DRILLING:
YES _____ NO X
TYPE: not applicable



MONITORING WELL
CROSS SECTION SCHEMATIC



SEA Consultants Inc.
Engineers / Architects

Cambridge, MA. Glastonbury, CT. Londonderry, NH.

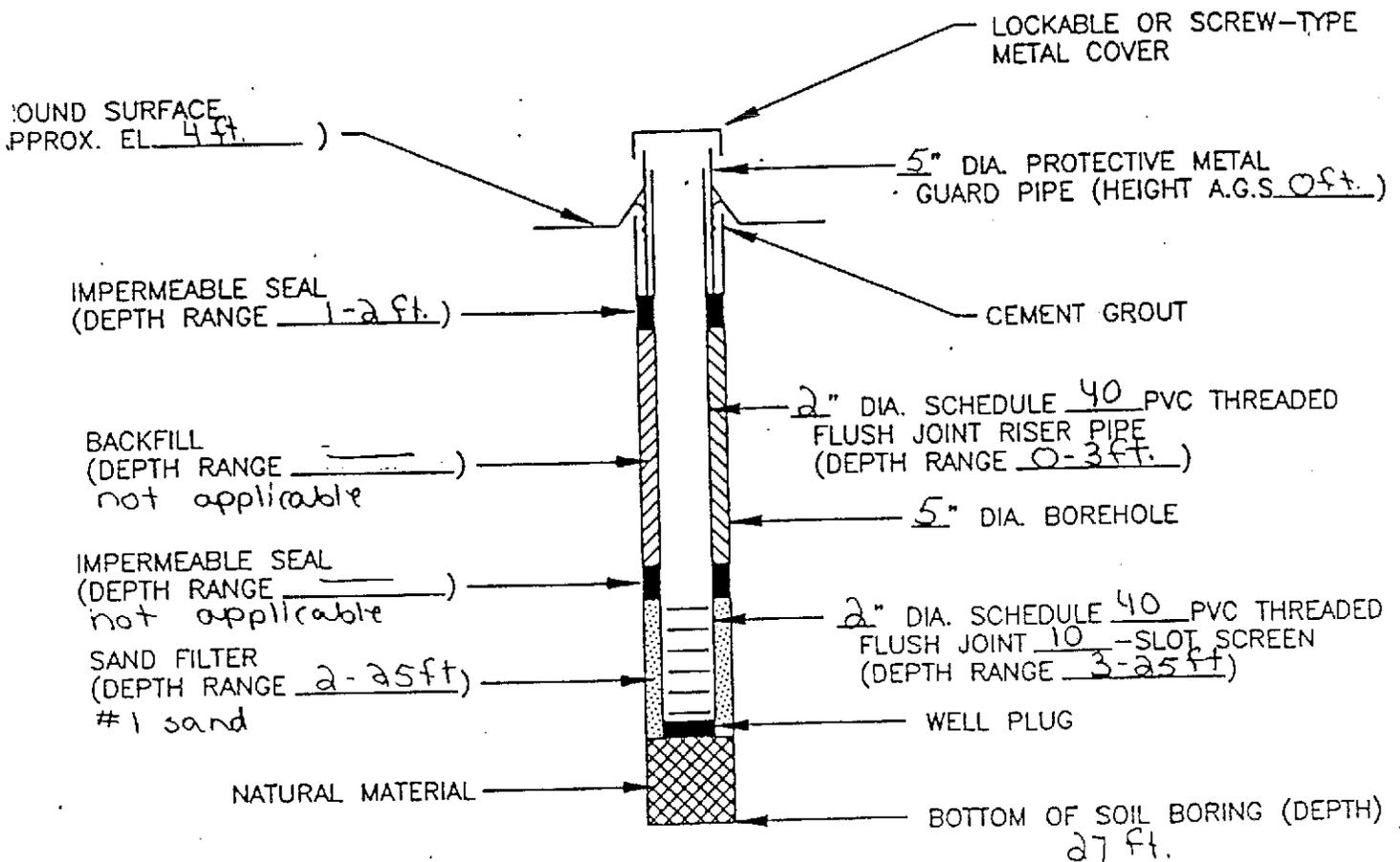
DRILLING CONTRACTOR: New Hampshire Boring
FOREMAN: Steve Clouette
METHOD: Hollow Stem Auger

SEA GEOLOGIST/ENGINEER: Joy LaPointe

GROUNDWATER LEVEL: 4 ft.
DATE: 9-28-98
TIME: 1015
FEET: 4 ft.
METHOD: probe
DATUM: 0 ft. (approximate)

MONITORING WELL NO: MW-2(B-3)
JOB NO: 98400.23A CLIENT: Cambridge
LOCATION: New Street Cambridge
DATE: _____
START: 9-28-98 FINISH: 9-28-98

SOIL SAMPLES TAKEN:
YES X NO _____
EQUIPMENT CLEANING:
YES X NO _____
METHOD: steam
MATERIAL TO FACILITATE DRILLING:
YES _____ NO X
TYPE: not applicable

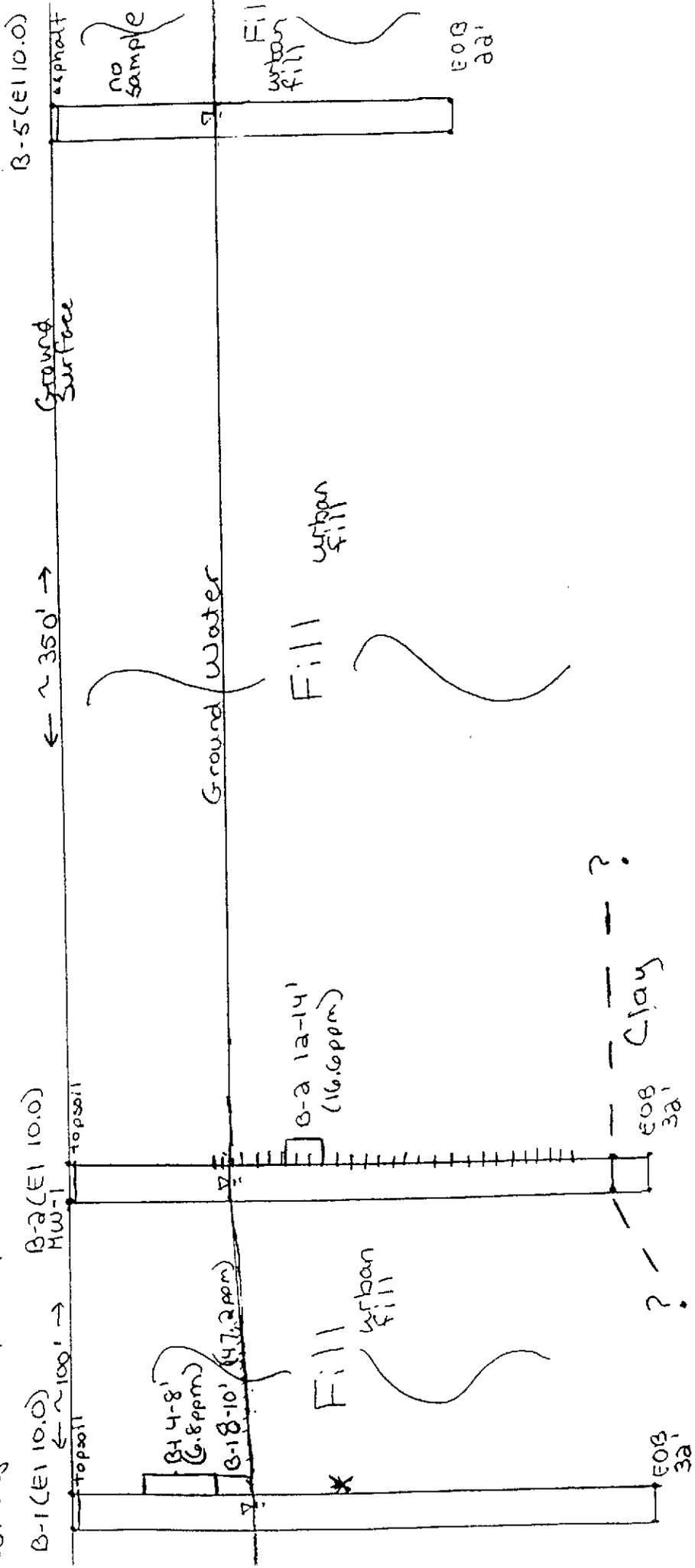


MONITORING WELL
CROSS SECTION SCHEMATIC

New Bedford
Cambridge, MA

Cross-Section

Borings 15-1, B-2, B-5



Key:

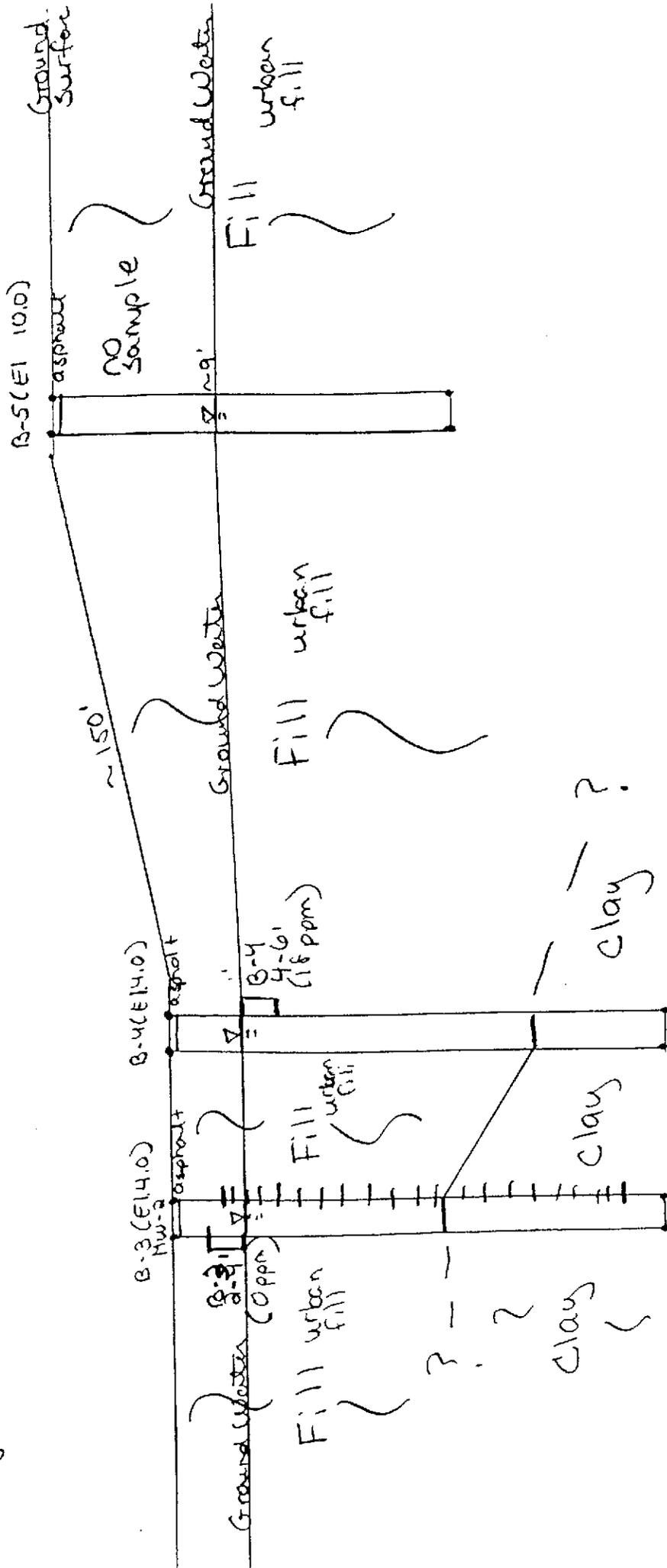
* Petro Odor (PID Readings)

expressed in parts per million volume
hexene equivalent (normal)

1 of 2
not to scale

New ^{11/02} WEEK
Cambridge, MA

Cross-Section
Borings B-3; B-4; B-5



Key:
* Petro Odor
(PID Readings)

expressed in parts per million volume
benzene equivalent ppmV

2 of 2
not to scale

ATTACHMENT 3

Groundwater Field Sample Logs



S E A CONSULTANTS INC.

GROUNDWATER FIELD SAMPLE DATA RECORD

PROJECT: Cambridge Sewer
CHARGE NO. 98400.22A
LOCATION: New St.
SAMPLE ID: MW-1 New SAMPLER(s): J. Kehoe
COLLECTION DATE: Oct. 9, 1998 COLLECTION TIME: 1300
WEATHER: Rainy
TEMPERATURE: 60s

WELL PURGE DATA:

Top of Riser to Top of Casing: 0.25 feet Start Time: 1200
Initial GWL: 8.8 feet below top of riser casing End Time: 1300
Well Depth: 25 feet below top of riser casing Total Vol Purged 8.1 gallons
Water Column Hgt. 16.2 Purge Method: PVC bailer
Well Diameter: 2 inches
One well volume = 264 gallons (2" = 0.163 g/ft, 4" = 0.653 g/ft)

STABILIZATION DOCUMENTATION

Table with 7 columns: Volume #, Initial, Vol #1, Vol #2, Vol #3, Vol #4, Vol #5. Rows include Time, Volume (Gal), pH, Spec. Conduc. (µmhos), Temperature (C), Visual Description, PID Ambient (ppm), and PID Casing (ppm).

ANALYTE(S):

see chain of custody

COMMENTS:

duplicate collected for metals analysis



SE&A CONSULTANTS INC.

GROUNDWATER FIELD SAMPLE DATA RECORD

PROJECT: Cambridge Sewer
CHARGE NO. 98400.23A
LOCATION: New St.
SAMPLE ID: MW-2 New SAMPLER(s): J. Kehoe
COLLECTION DATE: Oct. 9, 1998 COLLECTION TIME: 1400
WEATHER: Rainy
TEMPERATURE: 60s

WELL PURGE DATA:

Top of Riser to Top of Casing: 0.25 feet Start Time: 1300
Initial GWL: 2.8 feet below top of riser (casing) End Time: 1400
Well Depth: 22 feet below top of riser (casing) Total Vol Purged 9.6 gallons
Water Column Hgt. 19.2 Purge Method: PVC bailer
Well Diameter: 2 inches
One well volume = 3.13 gallons (2" = 0.163 g/ft, 4" = 0.653 g/ft)

STABILIZATION DOCUMENTATION

Table with 7 columns: Volume #, Initial, Vol #1, Vol #2, Vol #3, Vol #4, Vol #5. Rows include Time, Volume (Gal), pH, Spec. Conduc. (µmhos), Temperature (C), Visual Description, PID Ambient (ppm), and PID Casing (ppm).

ANALYTE(S):

COMMENTS:

see chain of custody

ATTACHMENT 4

Analytical Data

NEW STREET PUMP STATION PROJECT-
SUMMARY OF SOIL SAMPLE ANALYTICAL DATA

CLIENT SAMPLE I.D.:		MCP Reportable	B-1	B-1	B-2
LAB SAMPLE I.D.:		Concentrations	L9807590-01	L9807590-03	L9807590-02
SAMPLING DATE:		S-1	9/25/98	9/25/98	9/25/98
SAMPLE DEPTH:		5/18/98	4-8'	8-10'	12-14'
PARAMETERS*	UNITS		6.8 ppm **	147.2 ppm**	16.6 ppm**
Extractable Petroleum Hydrocarbons					
Aliphatics C9-C18	mg/Kg	1000	209	--	53.2
Aliphatics C19-C36	mg/Kg	2500	1470	--	755
Aromatics C11-C22	mg/Kg	200	1180	--	1840
Total EPH Concentration	mg/Kg		2860	--	2550
Volatile Petroleum Hydrocarbons					
Aliphatics C5-C8	mg/Kg	100	1.26	ND	24.7
Aliphatics C9-C12	mg/Kg	1000	1.26	ND	309
Aromatics C9-C10	mg/Kg	100	1.26	ND	129
Total VPH Concentration	mg/Kg	200	1.26	ND	463
Polyaromatic Hydrocarbons					
Fluoranthene	mg/Kg	1000	21	--	56
Acenaphthylene	mg/Kg	100	0.25	--	0.4
Dibenzo(a,h)anthracene	mg/Kg	0.7	0.75	--	2.2
1-Methylnaphthalene	mg/Kg	NP	0.42	--	1.6
2-Methylnaphthalene	mg/Kg	4	0.65	--	1.6
Volatile Organic Compounds					
p/m-Xylene	mg/Kg	500	0.0058	ND	0.12
Naphthalene	mg/Kg	4	0.034	ND	15
Semi-Volatile Organic Compounds					
Acenaphthene	mg/Kg	20	2.1	--	9.5
Fluoranthene	mg/Kg	1000	19	--	55
Naphthalene	mg/Kg	4	1.3	ND	3.3
Bis (2-ethylexyl) phthalate	mg/Kg	100	2.8	--	6.2
Benzo (a) anthracene	mg/Kg	0.7	9	--	27
Benzo (a) pyrene	mg/Kg	0.7	7	--	20
Benzo (b) fluoranthene	mg/Kg	0.7	6.3	--	17
Benzo (k) fluoranthene	mg/Kg	7	6	--	16
Chrysene	mg/Kg	7	9.5	--	27
Anthracene	mg/Kg	1000	4.2	--	16
Benzo (ghi) perylene	mg/Kg	1000	3.8	--	9.7
Fluorene	mg/Kg	400	2.5	--	10
Phenanthrene	mg/Kg	100	17	--	67
Indeno (1,2,3-cd) pyrene	mg/Kg	0.7	4.7	--	13
Pyrene	mg/Kg	700	16	--	50
Dibenzofuran	mg/Kg	100	1.4	--	4.4
Carbazole	mg/Kg	NP	1.6	--	3.6
Metals					
Antimony	mg/Kg	10	20	--	2.5
Arsenic	mg/Kg	30	12	--	11
Beryllium	mg/Kg	0.7	0.25	ND	0.36
Cadmium	mg/Kg	30	0.25	ND	1.8
Chromium	mg/Kg	1000	24	--	22
Copper	mg/Kg	1000	96	--	380
Lead	mg/Kg	300	10000	--	2200
Mercury	mg/Kg	20	1.2	--	2.5
Nickel	mg/Kg	300	13	--	20
Selenium	mg/Kg	400	0.64	--	0.94
Silver	mg/Kg	100	0.53	--	88
Zinc	mg/Kg	2500	310	--	1500

NOTES:

*Only the compounds detected in at least one sample collected per class of analytes are summarized above.

** Jar headspace reading measured in parts per million on a volume basis of equivalent benzene units.

"ND" = Not detected at the specified detection limit

"NP" = Not promulgated

-- = Parameter not measured

mg/Kg = milligrams/Kilogram, equivalent to ppm

BOLDDED values = exceedance of applicable regulatory standard

NOTE: CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE INFORMATION ABOVE BY REVIEWING THE ANALYTICAL REPORTS PROVIDED.

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**NEW STREET PUMP STATION PROJECT-
SUMMARY OF SOIL SAMPLE ANALYTICAL DATA**

CLIENT SAMPLE I.D.:		MCP Reportable Concentrations S-1 5/18/98	B-3 L9807649-01 9/28/98 2-4' 0 ppm **		B-4 L9807649-02 9/28/98 4-6' 18 ppm**	
LAB SAMPLE I.D.:	PARAMETERS*		UNITS			
Extractable Petroleum Hydrocarbons						
	Aliphatics C9-C18	mg/Kg	1000	23.8		40.5
	Aliphatics C19-C36	mg/Kg	2500	305		297
	Aromatics C11-C22	mg/Kg	200	124		258
	Total EPH Concentration	mg/Kg		454		595
Polyaromatic Hydrocarbons						
	Acenaphthene	mg/Kg	20	0.3		0.32
	Fluoranthene	mg/Kg	1000	4.9		1.5
	Naphthalene	mg/Kg	4	0.22	ND	0.4
	Benzo (a) anthracene	mg/Kg	0.7	2.3		1.2
	Anthracene	mg/Kg	1000	0.6		0.36
	Fluorene	mg/Kg	400	0.25		0.57
	Dibenzo (a,h) anthracene	mg/Kg	0.7	0.37		0.32
	Pyrene	mg/Kg	700	4.2		1.4
	1-Methylnaphthalene	mg/Kg	NP	0.22	ND	0.49
	2-Methylnaphthalene	mg/Kg	4	0.22	ND	0.76
Volatile Organic Compounds						
	Naphthalene	mg/Kg	4	--		0.076
Semi-Volatile Organic Compounds						
	Benzo (a) pyrene	mg/Kg	0.7	3.1		2
	Benzo (b) fluoranthene	mg/Kg	0.7	2.8		1.8
	Benzo (k) fluoranthene	mg/Kg	7	2.4		1.6
	Chrysene	mg/Kg	7	2.8		1.6
	Benzo (ghi) perylene	mg/Kg	1000	1.9		1.6
	Phenanthrene	mg/Kg	100	2.2		1.9
	Indeno (1,2,3-cd) pyrene	mg/Kg	0.7	2.6		1.7
Metals						
	Arsenic	mg/Kg	30	4.2		5.6
	Cadmium	mg/Kg	30	0.22	ND	0.54
	Chromium	mg/Kg	1000	8.7		9.1
	Copper	mg/Kg	1000	22		110
	Lead	mg/Kg	300	43		2400
	Mercury	mg/Kg	20	0.27	ND	1.1
	Nickel	mg/Kg	300	6.5		8.4
	Zinc	mg/Kg	2500	44		480

NOTES:

*Only the compounds detected in at least one sample collected per class of analytes are summarized above.

** Jar headspace reading measured in parts per million on a volume basis of equivalent benzene units.

"ND" = Not detected at the specified detection limit

"NP" = Not promulgated

-- = Parameter not measured

mg/Kg = milligrams/Kilogram, equivalent to ppm

BOLDED values = exceedance of applicable regulatory standard

NOTE: CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE INFORMATION ABOVE BY REVIEWING THE ANALYTICAL REPORTS PROVIDED.

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NEW STREET PUMP STATION PROJECT-
SUMMARY OF SOIL SAMPLE ANALYTICAL DATA

CLIENT SAMPLE I.D.:	RCRA	B-1	B-2	B-4
LAB SAMPLE I.D.:	Hazardous Waste Threshold Limit 40 CFR 261	L-9808117-01	L-9808117-02	L-9808117-03
SAMPLING DATE:		9/25/98	9/25/98	9/28/98
SAMPLE DEPTH:		4-8'	12-14'	4-6'
PARAMETERS*		10000 mg/Kg**	2200 mg/Kg**	2400 mg/Kg**
TCLP		100	6.0	0.50
Lead	5.0			ND

NOTES:

*Only the compounds detected in at least one sample collected per class of analytes are summarized above.

** Total Lead concentration

"ND" = Not detected at the specified detection limit

mg/L = milligrams/Liter, equivalent to ppm

BOLDED values = exceedance of applicable regulatory standard

NOTE: CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE INFORMATION ABOVE BY REVIEWING THE ANALYTICAL REPORTS PROVIDED.

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**NEW STREET PUMP STATION PROJECT-
SUMMARY OF GROUNDWATER ANALYTICAL DATA**

CLIENT SAMPLE I.D.:		MCP Reportable Concentrations	MW-1 New**	MW-2 New**	MW-10 New**
LAB SAMPLE I.D.:		GW-1	L9808010-02	L9808010-03	L9808010-05
SAMPLING DATE:		5/18/98	10/9/98	10/9/98	10/9/98
PARAMETERS*	UNITS				MW-1 Dup
Semi-Volatile Organic Compounds					
Fluoranthene	mg/L	0.2	0.02	0.018	--
Benzo(a)pyrene	mg/L	0.0002	0.01	0.01	--
Chrysene	mg/L	0.002	0.01	0.01	--
Phenanthrene	mg/L	0.05	0.029	0.011	--
Pyrene	mg/L	0.2	0.02	0.017	--
Sulfates					
Sulfates	mg/L		10	22	--
Volatile Organic Compounds					
Vinyl Chloride	mg/L	0.002	0.002	0.0053	--
Trichloroethene	mg/L	0.005	0.001	0.01	--
Total Petroleum Hydrocarbons					
Hydrocarbons	mg/L		9.4	36	--
Metals					
Arsenic	mg/L	0.05	0.100	0.339	0.077
Cadmium	mg/L	0.005	0.005	0.032	0.005 ND
Chromium	mg/L	0.1	0.28	0.87	0.21
Copper	mg/L	10	0.860	5.55	0.658
Lead	mg/L	0.02	6.43	11.5	4.94
Mercury	mg/L	0.001	0.0205	0.0377	0.0184
Nickel	mg/L	0.08	0.191	0.759	0.145
Zinc	mg/L	0.9	2.8	34	2.2

NOTES:

- *Only the compounds detected in at least one sample collected per class of analytes are summarized above.
- "ND" = Not detected at the specified detection limit
- = Parameter not measured
- mg/L = milligrams/Liter, equivalent to ppm
- BOLDED values = exceedance of applicable regulatory standard
- ** Groundwater samples collected appeared gray to black due to appreciable amounts of silt.
- Due to the amount of silt the results presented above may not be representative of the dissolved phase constituents.

**CONTRACTOR IS RESPONSIBLE FOR VERIFYING INFORMATION ABOVE
BY REVIEWING ANALYTICAL REPORTS PROVIDED**

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**NEW STREET PUMP STATION PROJECT-
SUMMARY OF GROUNDWATER ANALYTICAL DATA**

CLIENT SAMPLE I.D.:		MWRA Discharge	MW-1 New**	MW-2 New**	MW-10 New**
LAB SAMPLE I.D.:		Limitations	L9808010-02	L9808010-03	L9808010-05
SAMPLING DATE:			10/9/98	10/9/98	10/9/98
PARAMETERS*	UNITS				MW-1 Dup
Semi-Volatile Organic Compounds					
Fluoranthene	mg/L	1.5	0.02	0.018	--
Benzo(a)pyrene	mg/L	1.0	0.01	0.01	--
Chrysene	mg/L	1.0	0.01	0.01	--
Phenanthrene	mg/L	Prohibited	0.029	0.011	--
Pyrene	mg/L	1.0	0.02	0.017	--
Sulfates					
Sulfates	mg/L		10	22	--
Volatile Organic Compounds					
Vinyl Chloride	mg/L	1.000	0.002	0.0053	--
Trichloroethene	mg/L	0.070	0.001	0.01	--
Total Petroleum Hydrocarbons					
Hydrocarbons	mg/L		9.4	36	--
Metals					
Arsenic	mg/L	0.5	0.100	0.339	0.077
Cadmium	mg/L	0.1	0.005	0.032	0.005 ND
Chromium	mg/L	1.0	0.28	0.87	0.21
Copper	mg/L	1.5	0.860	5.55	0.658
Lead	mg/L	0.2	6.43	11.5	4.94
Mercury	mg/L	Prohibited	0.0205	0.0377	0.0184
Nickel	mg/L	1.0	0.191	0.759	0.145
Zinc	mg/L	1.0	2.8	34	2.2

NOTES:

*Only the compounds detected in at least one sample collected per class of analytes are summarized above.

"ND" = Not detected at the specified detection limit

-- = Parameter not measured

mg/L = milligrams/Liter, equivalent to ppm

BOLDED values = exceedance of applicable regulatory standard

** Groundwater samples collected appeared gray to black due to appreciable amounts of silt.

Due to the amount of silt the results presented above may not be representative of the dissolved phase constituents.

**CONTRACTOR IS RESPONSIBLE FOR VERIFYING INFORMATION ABOVE
BY REVIEWING ANALYTICAL REPORTS PROVIDED**

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**New Street Pump Station
Summary of Pump Station Effluent Analytical Data**

CLIENT SAMPLE I.D.:		MCP Reportable Concentrations	Pump Station Effluent
LAB SAMPLE I.D.:		GW-2	10/9/98
SAMPLING DATE:		5/18/98	L9807548-01
PARAMETERS*	UNITS		
Volatile Organic Compounds GC/MS 624			
Chlorobenzene	mg/L	1.50	0.004
Semi-Volatile Organic Compounds GC/MS 625			
None were detected			
Standard Parameters			
pH	su	--	7.3
PCB/Pesticides			
None were detected			
Metals			
Copper	mg/L	100	0.014

CLIENT SAMPLE I.D.:		MWRA Discharge Limitations	Pump Station Effluent
LAB SAMPLE I.D.:			10/9/98
SAMPLING DATE:			L9807548-01
PARAMETERS*	UNITS		
Volatile Organic Compounds GC/MS 624			
Chlorobenzene	mg/L	<1	0.004
Semi-Volatile Organic Compounds GC/MS 625			
None were detected			
Standard Parameters			
pH	su	bet. 5.5-10.5	7.3
PCB/Pesticides			
None were detected			
Metals			
Copper	mg/L	1.5	0.014

NOTES:

*Only the compounds detected are summarized above.
For complete analyte list, refer to complete analytical report appended to this report.
mg/L = milligrams/liter, equivalent to ppm

**CONTRACTOR IS RESPONSIBLE FOR VERIFYING INFORMATION ABOVE
BY REVIEWING ANALYTICAL REPORTS PROVIDED**

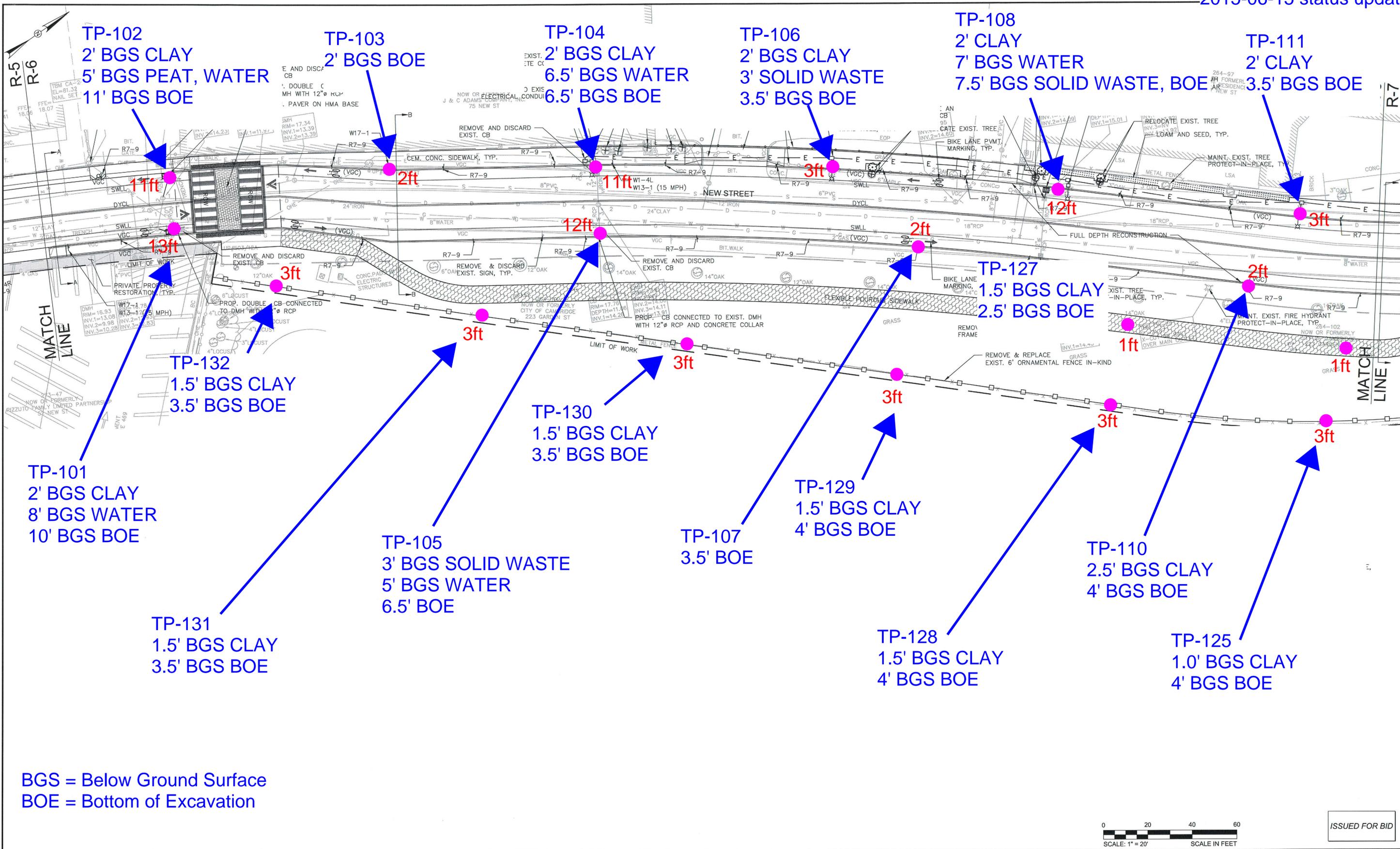
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Appendix C – Groundwater Analytical Results-New Street

Table 1
Groundwater Results
New Street, Cambridge

Parameter	SAMPLING LOCATION			MWRA DISCHARGE LIMITS	National Recommended Water Quality Criteria http://water.epa.gov/sitedocs/criteria/current/index.cfm
	New St.	New St. -FF (Field Filtered, .45 micron)	GW-2 (Danehy Park-CDM)		
Sampling Date	2/1/2013 8:30:00 AM	2/1/2013 8:30:00 AM	1/5/2012		
ASTM D516-90, O2 (mg/L)					
SULFATE	ND (2.0)	ND (2.0)	ND(10)		
Silica Gel Treated HEM (SGT-HEM)-TPH	ND (1.6)	NT	NT	300 (FOG)	
Turbidity	NT	29	NT	*	
EPA 200.7 (mg/L) Metals Digestion					
ANTIMONY	ND (0.050) *	ND (0.050) *	NT	10	
Arsenic	ND (0.010)	ND (0.010)	0.005	0.5	0.15
Barium	NT	NT	1.95		
Cadmium	0.0054	ND (0.0010)	ND(.005)	0.1	0.00025
Calcium	200	150	170		
Chromium	0.11	ND (0.0070)	ND(.010)	1	0.074
COPPER	0.60	0.0051	ND(.010)	1	
Iron	74	32	36	*	1
LEAD	0.84	ND (0.0050)	ND(.010)	0.2	0.0025
MAGNESIUM	57	43	NT		
MANGANESE	0.73	0.16	0.638	*	
Nickel	0.078	ND (0.0050)	NT	1	0.052
POTASSIUM	42	37	NT		
Selenium	ND (0.050)	ND (0.050)	ND(.010)	5	0.005
Silver	ND (0.010) *	ND (0.010) *	ND(.007)	2	.0032 (acute)
Sodium	220	200	170		0.12
Zinc	1.9	ND (0.010)	ND(.050)	1	0.00077
Mercury	0.0015	ND (0.00010)	ND(.0002)	0.001	
EPA 608(1) (µg/L)-PCBs	All ND	NT	NT	any detected	0.000014
EPA 608(2) (µg/L)-Pesticides		NT	NT	any detected	
BETA-BHC	0.16	NT		any detected	
EPA 624 (µg/L)-VOCs		NT		Each less than 1000, exc. as noted	
ACROLEIN	ND (10)	NT	NT	150	3
BENZENE	ND (1.0)	NT	ND	300	
1,1-DICHLOROETHYLENE (Vinylidene Chloride)	ND (2.0)	NT	ND	300	
MTBE	9.9	NT	ND	1000	
VINYL CHLORIDE	ND (2.0)	NT	ND	20	
EPA 625 (µg/L)-SVOCs	All ND	NT	NT	Each less than 1000, exc. as noted	
HEXACHLOROBUTADIENE	ND (10) *	NT	NT	any detected	
Total Toxic Organics (VOCs + SVOCs)	9.9	NT	1.7	5000	
EPA 8315 (µg/L)					
Formaldehyde	ND (53)	NT	NT	9000	
MADEP-EPH-04-1.1 (µg/L)	All ND	NT		300,000	
SM 18-20 4500 NO2 B (mg/L)					
NITRITE	ND (0.010)	ND (0.010)	NT		
SM 18-20 4500 NO3 F (mg/L)					
NITRATE	ND (0.050)	ND (0.050)	ND(0.10)		
SM 18-20 4500 P E (mg/L)					
Phosphorus, Total	0.26	0.23	NT		
EPA/APHA/SW-8					
Silica (SiO2)	35.1	47.7			
SM 5310B (mg/L)					
SM 5310B (mg/L)-Total Organic Carbon	19	24	NT		
SM18-20 2320B (mg/L)					
Alkalinity	800	NT	710		20
SM18-20 2540D (mg/L)					
Total Suspended Solids	Table	***	NT		
Total Dissolved Solids			1000		
SM18-20 3500 Fe D (mg/L)					
Ferrous Iron	31	31	NT		
Ferrous Iron	31	31			
SM18-20 4500 CL B (mg/L)					
Chloride	290	290	200		230
SM18-20 4500 CN E (mg/L)					
CYANIDE	ND (0.010)	NT	ND(.005)	0.5	0.0052
SM18-20 4500 H B (pH Units)					
pH	6.9	NT	6.07	5.5-12	6.5-9
Sp. Conductivity (umho/cm)	NT	NT	1793		
D.O., mg/L	NT	NT	1.12		
COD, mg/L	NT	NT	54		
NOTES:					
1. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.					
2. ND = Not detected above the lab reporting limits shown in parenthesis.					
3. NT = Not tested.					
*No substance causing noticeable turbidity or discoloration					
** prohibited: Groundwater, stormwater, surface water, roof or surface runoff, ...subsurface drainage except as permitted					
hibited: fire or explosion hazards, gases, filter backwash					
*** measured value to 70 mg/L not meaningful value because .45 micron field filter smaller than 2 micron filter used for TSS method					

Appendix D – 2015 Test Pit Locations and Observations-New Street



BGS = Below Ground Surface
BOE = Bottom of Excavation

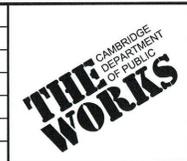


ISSUED FOR BID

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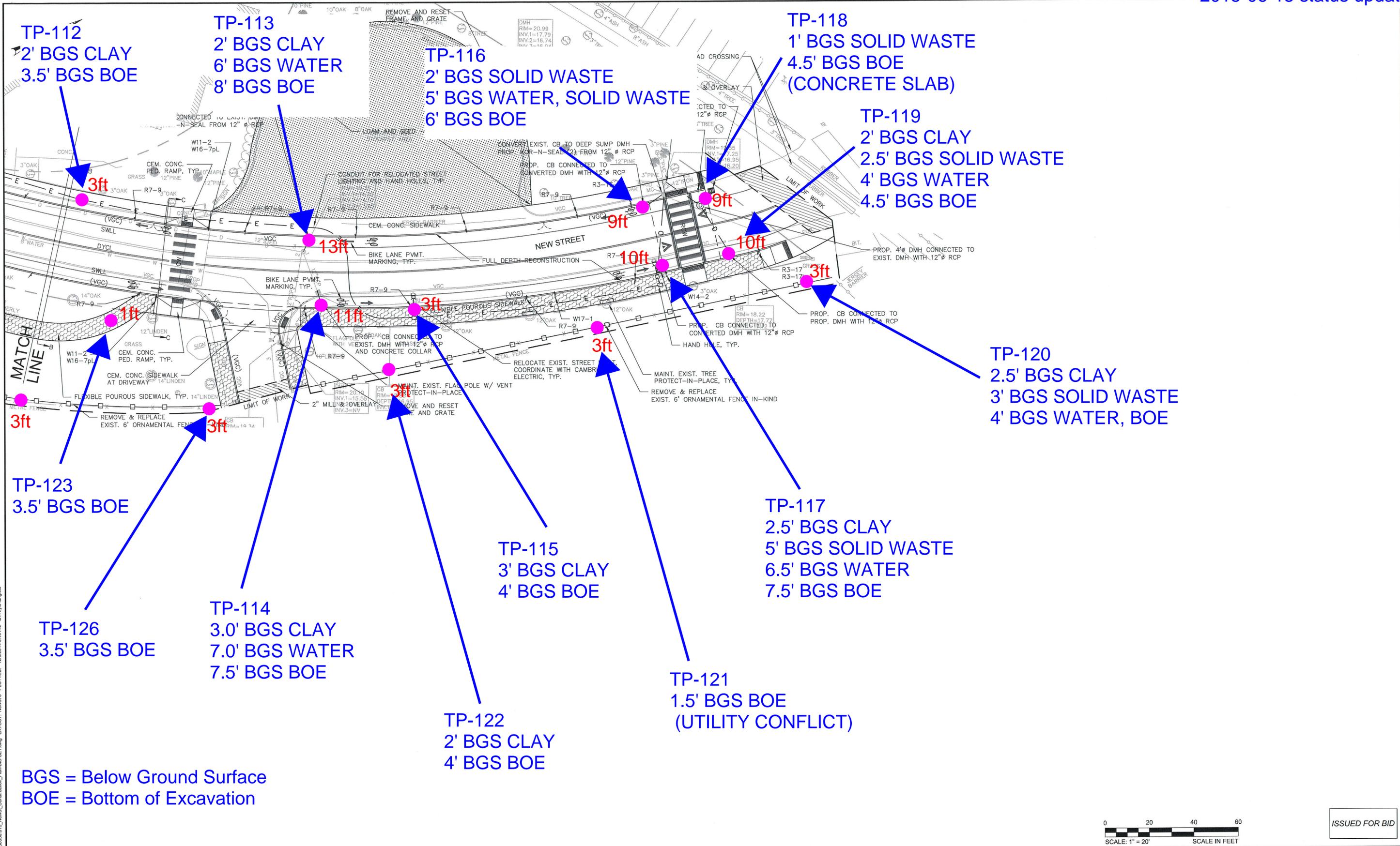


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Job No.	20130056.013A		
Designed by	KJL		
Drawn by	KJL		
Checked by	BJM	No.	Description
Approved by	BJM		REVISIONS



Client	CITY OF CAMBRIDGE, MASSACHUSETTS
Project	CONCORD LANE AND NEW STREET SEWER AND PUMP STATION IMPROVEMENTS PROJECT
Drawing	ROADWAY - CONSTRUCTION PLAN NEW STREET STA ##### TO #####

Sheet	R-6
File No.	6676



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ISSUED FOR BID

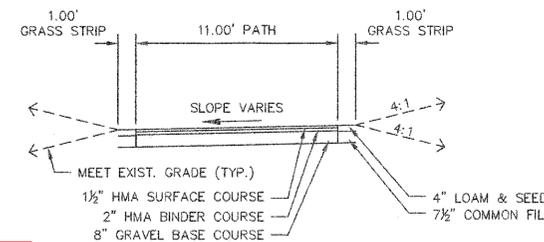


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Drawn by	KJL		
Checked by	BJM	No.	Description
Approved by	BJM		REVISIONS



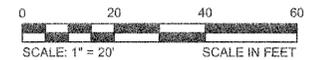
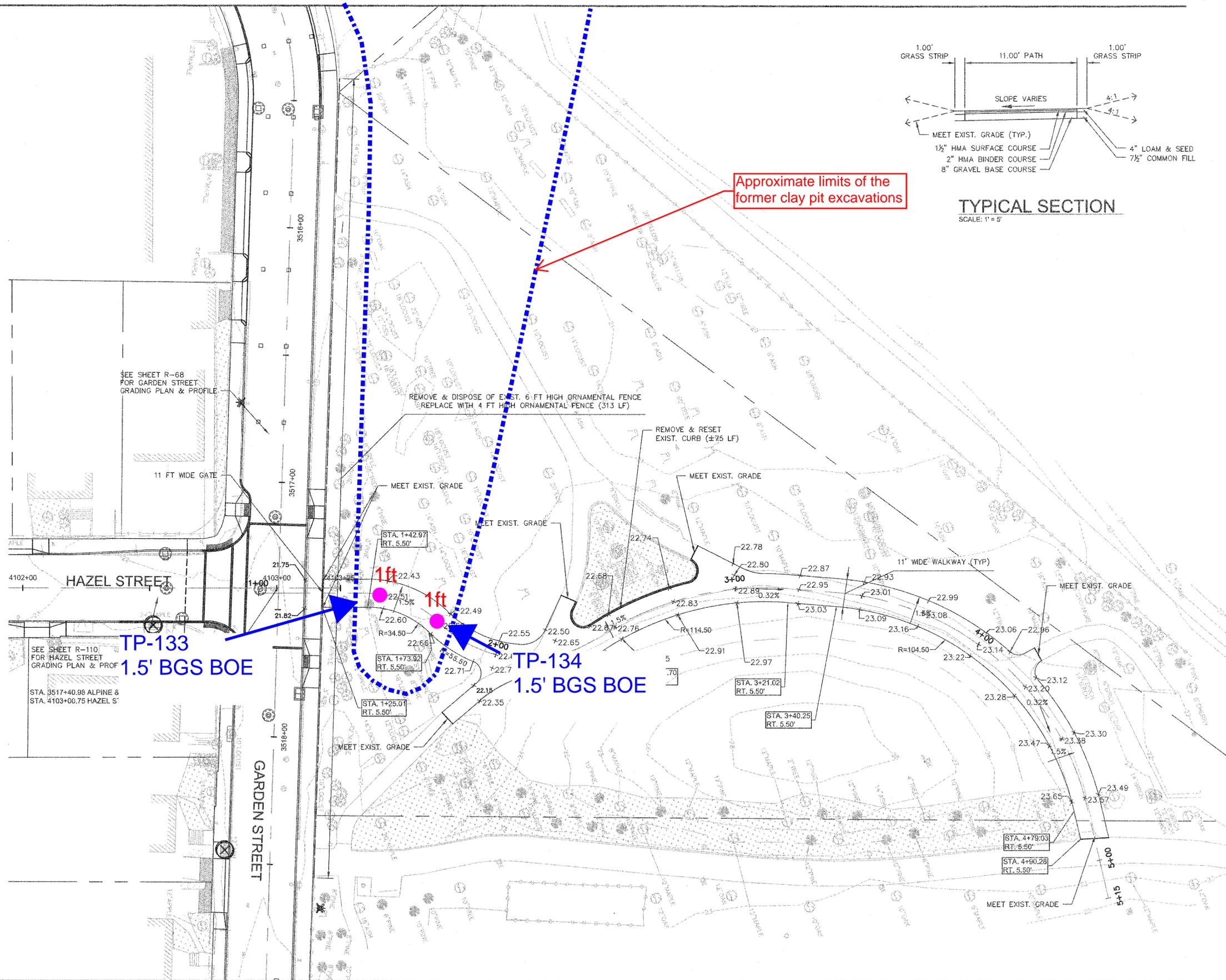
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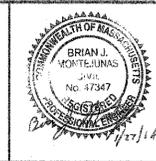
TYPICAL SECTION
SCALE: 1" = 5'

Approximate limits of the former clay pit excavations



CONFORMED SET

CAD FILE: G:\clients\cambridge\MA2012256\01-1-A - Concord Ave (Contract 9)\Drawings\Civil\Production Drawings\Grading\Grading_DanahyPark.dwg LAYOUT: Grading - Danahy Park PLOTTED: 2/12/2014 8:44 AM BY: Kyle Langhals



Scale	AS NOTED		
Date	FEBRUARY 2014		
Job No.	20120256.001A		
Designed by	TAL/URB/FMM		
Drawn by	KJ/DRM/BMS/DRB		
Checked by	CMC/TJR	No.	Description
Approved by	BJM		REVISIONS



Client	CITY OF CAMBRIDGE, MASSACHUSETTS
Project	CONCORD (CONTRACT 9) SEWER SEPARATION AND SURFACE IMPROVEMENTS PROJECT
Drawing	ROADWAY - GRADING & LAYOUT PLAN DANEHY PARK

Sheet	R-115
File No.	6228

**Appendix E
Locations**

New Street Site Investigations Plan-Catch Basin

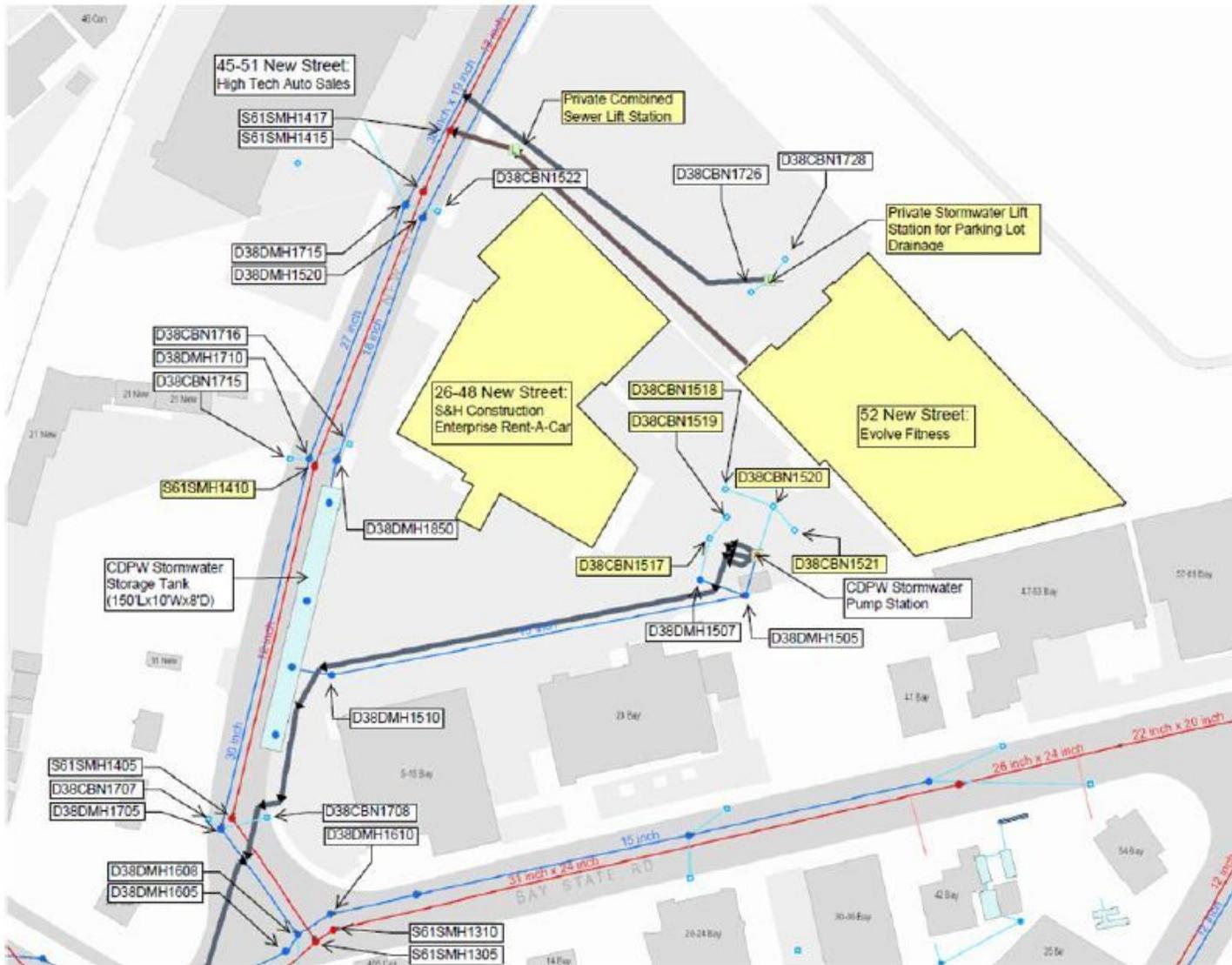


Figure 4: New Street Site Investigations Plan