SAGE
ENVIRONMENTAL

CONSTRUCTION DEWATERING AND GROUNDWATER MANAGEMENT PLAN

for

Cushing Village
102-104 Trapelo Road
Belmont, Massachusetts

Prepared for:

Belmont Residential, LLC
250 Gibraltar Road, 3 West
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Prepared by:

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SAGE Project No. R090

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1.0 INTRODUCTION

1.1 Purpose

This Project Site-specific Construction Dewatering and Groundwater Management Plan (CDGMP) has been prepared by SAGE Environmental, Inc. (SAGE) for the environmental- and construction-related activities planned for the proposed Cushing Village redevelopment (the Project). The proposed Cushing Village is comprised of several parcels, which are currently addressed as follows:

- 102-104 Trapelo Road
- 112 Trapelo Road
- 116 Trapelo Road
- 495 Common Street
- 505 Common Street
- 527 Common Street

This CDGMP was prepared with consideration to the following documents:

- *Draft Release Abatement Measure (RAM) Plan for Public Comment, Cushing Village, Common Street and Trapelo Road, Belmont Massachusetts RTN 3-23300, 3-20284, 3-26360, 3-20385 and 3-26566 prepared by CHA Companies*, dated August 14, 2014;
- *Section 312319 Dewatering, Cushing Village Belmont, MA* prepared by CHA Companies, Inc., dated May 2016;
- *NPDES Permits for Cushing Village, Belmont, MA,* prepared by CHA Companies, dated August 12, 2014;
- *Preliminary evaluation of dewatering effects on the distribution of dissolved phase contamination at Tops Cleaners upon Common Street Trust building at 102-104 Trapelo Road, Belmont, MA* prepared by LFR, dated October 20, 2006;
- *Immediate Response Action Completion Statement and Phase IV Remedial Implementation Plan Modification, 495 Common Street, Belmont MA*, prepared by Coler and Colantonio, Inc., dated March 5, 2012;
- *Geotechnical Engineering Report, Cushing Village, Belmont, Massachusetts*, prepared by CHA, dated June 5, 2014; and,
- *Design of Excavation-Shop Drawings*, stamped by Nauset Construction, dated 9/10/2016.

This CDGMP is for use by Belmont Residential, LLC, their General Contractor Nauset Construction

Inc., SAGE and relevant subcontractors (i.e., the Project Team).

This CDGMP presents the requirements and procedures to be undertaken to install and operate a dewatering system to continuously lower and control groundwater levels and hydrostatic pressures to maintain the stability of the proposed soil-nail slope stabilization system and maintain near-dry conditions for construction of the work as shown on the plans or specifications referenced herein. This CDGMP is applicable to the entire Site.

The Cushing Village project involves construction of three multi-story, mixed residential/commercial buildings on the Site. Each building will have underground parking beneath with finished floor elevation below existing grade.

- Building 1, The Winslow will be constructed on the 112 and 116 Trapelo Road parcels. Excavation will be conducted to a depth of between 11 feet and 14 feet below existing grade. Approximate depth to groundwater at this location ranges from 4.86 to 7.85 feet below grade.

- Building 2, The Pomona will be constructed on the 102-104 Trapelo Road and 495 Common Street Parcels. Excavation will be conducted to between 5 feet and 16 feet below grade. Depth to groundwater at this location ranges from approximately 6.60 to 7.92 feet below grade.

- Building 3, the Hyland will be constructed on the 505 and 529 Common Street parcels. Excavation will be conducted between 6 feet and 29 feet below grade and will involve removal of weathered bedrock and limited removal of competent bedrock. Depth to groundwater at this location ranges from approximately 11.90 to 24.10 feet below grade.

One of the Site parcels was the former location of the Tops Cleaners, a dry cleaning facility. The overall Site has been subject to several releases and/or threats of release of oil and/or hazardous material identified by the Massachusetts Department of Environmental Protection (MassDEP) as Disposal Sites and tracked under the following Release Tracking Numbers (RTNs): 3-0020284, 3-0020385, 3-0023300, 3-0023658, 3-0026360, 3-0026566, 3-0032540, 3-0023541, and 3-0023542. Collectively, these RTNs represent the Disposal Site, which includes portions of the Site being redeveloped. A Site Plan is included as **Figure 1**.

A release of chlorinated solvents has resulted in impacts to groundwater at the 495 Common Street property, which has migrated downgradient from the point of release. Volatile organic compounds (VOCs) are considered to be contaminants in the future dewatering effluent, which requires treatment prior to discharge to Wellington Brook via the Town of Belmont storm drain system. Catch basins discharging to this system are located at points on Common Street, Trapelo Road and Williston Road. The dewatering system will collect groundwater, which will be pumped into a treatment system prior to discharge. This discharge is approved under an existing Site-specific United States Environmental Protection Agency (USEPA) National Pollutant Discharge Elimination

System (NPDES) Remediation General Permit (RGP) (RGP Permit No. MAG910403) and requirements by the Town of Belmont. Effluent treatment will consist of settling to remove solids, filtration of fines, metal absorption via a green sand media and absorption of organic compounds via granular activated carbon (GAC).

The requirements and procedures for installing and operating the dewatering system include the following:

- Complying with this CDGWP, the Site-specific USEPA NPDES RGP and requirements by the Town of Belmont for effluent discharge;
- Coordination of this CDGMP with a Release Abatement Measure (RAM) Plan;
- Providing Public Notice and soliciting Public comment in accordance with the requirements of the Massachusetts Contingency Plan (MCP and the Site's Public Involvement Plan (PIP);
- Providing notice to owners/operators of underground utilities and obtaining required State and Local permits and approvals prior to performing subsurface work related to installation, startup and operation of the dewatering system;
- Retaining the services of a Grade 2 Wastewater Treatment System Operator (System Operator) to oversee installation, startup and operation and monitoring of the dewatering effluent treatment system. The System Operator will ensure that the required sampling and testing occurs, as required by the RGP;
- Requiring that activities are conducted in accordance with a Site-specific Health and Safety Plan (HASP) prepared by SAGE;
- Proper management and disposal of wastes generated by effluent treatment; and
- Proper removal of dewatering and treatment equipment, if applicable.

1.2 Responsibilities

A. General Contractor's (Nauset Construction's) Responsibilities:

1. Provide staging areas for dewatering effluent storage and treatment equipment and obtain permits for work within public streets or sidewalks associated with installation of dewatering wells, well points and dewatering effluent conveyance piping.
2. Prepare and acquire all documentation, permits, passes, and coupons required for off-Site disposal of non-hazardous waste materials, except those noted below as responsibility of the Environmental Consultant or Owner.
3. Provide continuous and uninterrupted electrical power adequate to operate

the dewatering pumping and treatment equipment.

B. Environmental Consultant's (SAGE) Responsibilities:

1. Review and consolidate previous site data and perform analytical and hydrogeological testing required to obtain data for design of the dewatering well network and effluent treatment system.

2. Design and install the dewatering well network, dewatering effluent collection system and effluent treatment system.

3. Obtain a Notice of Change (NOC) to re-activate the existing NPDES RGP.

4. Provide a Massachusetts-licensed Grade 2 Wastewater Treatment System Operator to oversee design, installation and operation of the effluent treatment system.

5. Dispose of spent treatment system absorption and filtering media.

6. Prepare material shipment bills of lading or manifests as required.

7. Prepare any documentation required by the MCP related to the installation and operation of the dewatering and treatment system, including the RAM Plan to which this CDGMP is appended.

C. Owner's (Belmont Residential, LLC or its Agent) Responsibilities

1. Act as generator for all contaminated material transported off-Site.

2. Sign all waste manifests and bills of lading as required for off-site transport and disposal of spent treatment system absorption and filtering media.

2.0 PRECONSTRUCTION REQUIREMENTS

The following must be completed prior to commencement of the installation of the dewatering well network and startup of the dewatering pumping and effluent treatment system:

National Pollution Discharge Elimination System (NPDES) Permits for Discharge of Dewatering Effluent and Local Permits: Due to the presence of VOCs in groundwater at the Site, discharge of dewatering effluent must be permitted under a RPG issued by the US Environmental Protection Agency (Permit MAG910000). A RGP (Permit No. MAG910403) was previously issued for discharge of groundwater from a sump located in the buildings at 102-104 Trapelo Road under the 2010 RGP. The NOC submission included changes in discharge volume, flow rate and the change in Site ownership. EPA Region 1 approved the NOC on February 28, 2017 which allows

for the continued discharge of up to 100 gallons per minute (GPM) of dewatering effluent. Since the 2010 RGP has expired and is being temporarily extended by EPA until the 2016 RGP is authorized, effluent limitations approved in the NOC meet those put forth in the Draft 2016 RGP. Local permits may be required to discharge to the storm drain system. Copies of the NOC and approval are included as **Appendix 1.**

- **Public Notification and Involvement Activities:** Public notification and Public Involvement activities must be undertaken and approved prior to commencing activities under the RAM Plan.

- **Underground Utility Notification and Clearance and Local Permits:** Underground utilities are present beneath Trapelo Road, Common Street, Williston Street, Horne Road and Belmont Street. Installation of dewatering wells will likely be in close proximity to these utilities. Dig Safe must be notified 72 hours prior to installation of wells or any other activity which may penetrate the ground surface. Work within the public sidewalks or roadways requires a street opening permit from the Town of Belmont and a permit from the Massachusetts Water Resources Authority (MWRA) specifically for work on Common Street.

- **Project Description:** Belmont Residential, LLC is redeveloping the Site, which included a former dry cleaning facility. Redevelopment plans include the demolition and removal of existing structures and construction of new ones. Construction involves installing excavation sidewall slope shoring system consisting of soil nails and soldier pilings and removal of soils and weathered bedrock at depths below the average groundwater table. No sheet pile supports are proposed. Installation of dewatering wells will be coordinated with the soil support system installation to ensure that the support system does not interfere with or damage the dewatering wells.

  A portion of the area (495 Common Street) is impacted with VOCs due to a former release of dry cleaning solvents. VOCs in groundwater are present at concentrations that exceed the MCP Method 1 groundwater standards.

  Work will be conducted pursuant to a RAM Plan, to which this CDGMP Plan is appended. All groundwater and surface water removed by the dewatering system will require treatment prior to discharge to a level that complies with the effluent discharge concentration limitations of the Draft 2016 RGP.

- **Owner Notification:** In emergency situations, Belmont Residential, LLC shall be notified before commencing activities. Also, Belmont Residential, LLC shall be notified immediately (within one hour) if unanticipated conditions are encountered including conditions that meet the criteria for a 2-hour or 72-hour release notification under the Massachusetts Contingency Plan (MCP).

- **Regulatory Review and Submittals:** A review of other federal, state, or local regulatory requirements (e.g., Town of Belmont demolition and building permits, MWRA Permit, RAM Plan, this Plan, etc.) shall be conducted before work commences depending on the location and type of planned activity.

- **Health and Safety Plan:** A Site-specific HASP has been prepared by SAGE to address the anticipated contaminants of concern using historic Site characterization data. Contractors subject to SAGE's HASP are solely responsible for conducting the work in a manner that is protective of workers and the public.

3.0 GROUNDWATER CHARACTERIZATION

SAGE reviewed historical analytic results at twenty-two (22) groundwater monitoring wells located within the area to be dewatered. Average concentrations of tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and trans-1,2-dichloroethene (trans-1,2-DCE), vinyl chloride and methyl tert-butyl ether (MTBE) were calculated and used in designing the treatment system. Review of this data also indicated that cyanide and petroleum constituents were present in groundwater samples at concentrations above their applicable MassDEP Method 1 groundwater standards. The cyanide and petroleum detections have been attributed to an upgradient off-Site source. Since they may be present in the dewatering effluent, they have been taken into consideration in the design of the treatment system.

A groundwater sample was collected from the monitoring well identified as ACT-01 on November 30, 2016 to better characterize levels of contamination that may be present in dewatering effluent. This well is located immediately downgradient from the portion of the 495 Common Street parcel impacted by a release of dry cleaning solvents. This sample was analyzed for effluent discharge monitoring parameters contained in the Draft 2016 RGP using the analytical methods specified by the Draft 2016 RGP. Several VOCs including TCE, PCE, cis-1,2-DCE, and vinyl chloride were detected in the groundwater sample. The compound 1,4-dioxane was not detected. In addition, some metals, including antimony, iron, lead, nickel and zinc were detected in the groundwater sample.

A copy of the laboratory analytical results from well ATC-01 is included in **Appendix 2.**

According to the CHA Geotechnical Engineering Report, average groundwater elevations within the excavation area are as follows:

- Proposed Winslow Building area: ranged between 145.94 feet to 141.55 feet from south to north (average depth to groundwater between 4.86 to 7.85 feet below grade surface (bgs));

- Proposed Pomona Building Area: ranged between 146.87 feet to 146.02 feet from south to north (average depth to groundwater between 6.60 and 7.92 feet bgs); and
- Proposed Hyland Building Are: ranged between 148.19 feet to 146.84 feet from south to north (average depth to groundwater between 11.90 and 29.10 feet bgs).

Analysis of vertical groundwater flow was evaluated in bedrock and overburden well couplets installed in the vicinity of the Site by SAGE. This analysis indicated that groundwater is flowing upward from the bedrock into the overburden. Under operational conditions, the dewatering system will likely induce horizontal and upward vertical groundwater flow into the excavation area and control migration of contaminants from the VOC source area.

Groundwater observations are presented in **Appendix 3.**

4.0 GEOLOGICAL CHARACTERIZATION

Boring logs generated at the Site are included in the Geotechnical Engineering Report, a copy of which is included as **Appendix 2.** These boring logs provide physical descriptions of soil and depth to bedrock at the Site. Portions of the Site in the vicinity of the intersection of Common Street and Trapelo Road (typical of boring log for boring B-306) and the intersection of Trapelo Road and Williston Road (typical of boring log for boring B-308) contain between 5 to 10 feet of urban fill containing brown to black silt with coarse sand and gravel, coal, brick, glass and coal ash. The fill is underlain by approximately 10 feet of dense silt and coarse gravel with some clay. Clayey silt and weathered bedrock was encountered between 20 and 25 feet bgs, whereas heavily fractured competent bedrock was encountered at approximately 25 feet bgs.

In the vicinity of Horne Road and Common Street, (typical of boring log for CHA-4), fill material is present to a depth of approximately 4 feet bgs, which is underlain by approximately 2 feet of peat. The peat is underlain by fine to medium sand with some silt and gravel (glacial till) to a depth of approximately 23 feet bgs. The till is underlain by hard clayey silt and weathered bedrock to a depth of approximately 40 feet bgs. In the vicinity of Belmont Street (former CVS parking lot, typical of boring log for monitoring well CC-302), fine to medium sand with some silt and gravel extends to approximately 10 feet bgs, dense fine/medium coarse sand with little silt and gravel (glacial till) extends to approximately 20 feet bgs where hard clayey silt and weathered bedrock is encountered. Weathered bedrock extended to the end of the boring at a depth of 52 feet bgs. Based on the data reviewed to date, it is likely that dewatering effluent will contain some level of sands and silts.

Bedrock underlying the Site is identified at the Cambridge Argillite, a highly fractured, fine-grained metamorphic rock composed of gray argillite and minor quartzite; rare sandstone and conglomerate. The strike of the foliation in the vicinity of the Site trends generally east to west,

and dips to the north at angles between 30 and 50 degrees. Rock core borings logs from the Site support the heavily fractured nature of the bedrock, with tight to loose fractures at angles ranging from 0° to 90° and fracture lengths ranging from ¼ inch to 13 inches. Fractures contain silt, clay and calco-pyrite with some cemented fractures. Pump test and packer tests have not been performed on the Site's bedrock. Given the frequency and size of the fractures, the bedrock aquifer is likely highly interconnected and may, in the aggregate, behave in an isotropic manner.

Borings logs, a site plan depicting boring and monitoring well locations and a geological cross sections of the Site are presented in **Appendix 3**.

5.0 HYDROGEOLOGICAL CHARACTERIZATION

Hydrogeology of soil and shallow bedrock at the Site will be characterized to provide the following parameters, which will be used to design the dewatering system well layout. This will include an evaluation of:

- Estimates of transmissivity and storage coefficient of the overburden aquifers based on comparison of observed physical characteristics to published data;
- Static water level;
- Depth and thickness of the aquifer; and,
- Sources of recharge to the aquifer.

6.0 DEWATERING DESIGN AND INSTALLATION

The design of the dewatering system will be based on hydrogeological data, geological data and the shoring plans contained in **Appendix 4**. Initial design calculations and layout of dewatering wells and sumps will be determined through known hydrogeological conditions, excavation sequencing, field observations, professional judgement and transmissivity estimates.

Dewatering wells will be placed outside the limits of excavation on the 116 Trapelo Road property (See **Figure 2**). Dewatering wells will be 1-1/2-inches in diameter placed 10 feet on center. The dewatering wells will be placed in 6-inch-diameter borings that will be augured to the surface of the competent bedrock. Groundwater will be extracted from overburden well points by self-priming vacuum-assisted pumps. All water removed from dewatering well points or sumps will be conveyed to the treatment system in a closed conduit.

Dewatering within the excavation will be by a series of sump pits and stone filled trenches that will be either pumped or graded to drain to a lined sump (location to be determined). Water from the sump will be pumped to frac tanks for settling, then pumped to the treatment system for treatment to meet Draft 2016 RGP effluent limitations prior to discharge.

7.0 TREATMENT OF DEWATERING EFFLUENT

Effluent generated during excavation dewatering, regardless of soil classification, will be treated on the Site and discharged to surface water (Wellington Brook) via the Town's storm drain system. Dewatering effluent will require treatment to meet the effluent discharge limits of the Draft 2016 RGP. The effluent treatment system design is based on the EPA-approved a discharge flow rate of 100 GPM.

The loading concentrations used to calculate the life of the GAC vessels in the dewatering effluent treatment system are based on the average of the most recent concentrations of vinyl chloride and all other chlorinated VOCs detected at twenty (20) monitoring wells located within the boundaries of the Site. The loading calculation used a flow rate of 100 GPM and the following VOC concentrations detected in these samples:

- cis-1,2-Dichloroethene 37 µg/L
- Tetrachloroethene 20 µg/L
- Trichloroethene 22.6 µg/L
- Vinyl chloride 5.0 µg/L
- Methyl tert-butyl ether 22 µg/L

The maximum allowable flow rate under the EPA approved NOC for the RGP is 100 GPM. The storm drain system that will receive discharge from the treatment system has a diameter of 24 inches and has a capacity, when full, of approximately 750 GPM.

The treatment system includes the following elements:

- Removal of gross fines through settling in two 21,000-gallon capacity baffled fractionation tanks equipped with high water detection/alarms;
- Effluent will be pumped from the fractionation tank to a treatment system equipped with the following treatment train:
  - 25-micron and 10-micron bag filters (in series) to remove fine sediment;
- Removal of inorganic contaminants (metals and cyanide) by Greensand Plus™ filtration;
- Removal of organic compounds by GAC filtration;
- Flow totalizer;
- Discharge to the Town storm drain system.

Organic vapors will be monitored in soil vapor generated by the dewatering system's vacuum-assisted pumps. Initially, it is presumed that concentrations of organic vapors will be below the MassDEP 100 pound per year threshold which requires treatment. Soil vapor discharging from the dewatering system pumps with be monitored for organic vapors with a portable gas

chromatograph. If the 100-pound limit appears likely to be exceeded, vapors will be treated by air-phase GAC to remove 99 percent of volatile components prior to discharge to the atmosphere. Removal efficiency will be determined by monitoring of influent and effluent vapors with a portable gas chromatograph

Pumps and auxiliary equipment associated with the operation of the dewatering and treatment system will be electrically powered. An emergency power source of sufficient capacity to provide system peak load power will be maintained on Site to provide, in the event of interruption of utility-provided power, continuous uninterrupted operation of the dewatering and treatment system during excavation and foundation construction.

All used filter materials and absorption media will be disposed of in compliance with federal, state and local laws and regulations.

8.0 STARTUP, OPERATION, MONITORING, REPORTING AND NOTIFICATIONS

A Massachusetts Grade 2 Wastewater Treatment Plant Operator will operate the treatment system.

8.1 Dewatering System Inspection and Monitoring

The dewatering and treatment system startup will take place prior to initiation of excavation activities to ensure that static groundwater levels are achieved and maintained at the required critical elevation of two (2) feet below the bottom elevation of the excavation. The critical point elevation varies with excavation depth and ranges from elevation 145 feet above mean sea level (MSL) near Belmont Street to 136 feet MSL in the vicinity of the intersection of Williston Street and Trapelo Road.

The system shall be kept in continuous operation to maintain groundwater at an elevation at least two (2) feet below the greatest proposed excavation depth. During operation of the dewatering system, groundwater levels will be monitored daily at a set of pre-selected overburden and bedrock monitoring wells placed within and adjacent to the limits of excavation. Detection of groundwater levels above the critical point elevation will be immediately reported to the Contractor and the Treatment System Operator who will initiate corrective actions to reduce groundwater levels so they are maintained at the required elevation.

If precipitation events require pumping at a rate greater than 100 GPM to maintain the critical elevation, water generated by pumping in excess of 100 GPM will be directed to a standby frac tank for storage and later treatment.

Settlement point bench marks will be established in the area adjacent to the dewatered excavation prior to commencing dewatering. These benchmarks shall be carefully inspected on a daily basis to detect any settlement. The Contractor shall be notified immediately of any signs of settlement. The Contractor shall take all precautions and perform any work necessary to protect the stability and integrity of adjacent lands, pavements, buildings and utilities from settlement or other movement that may be caused by the dewatering operations. The Contractor shall be solely responsible for any damage or injury to adjacent lands, pavements, buildings, or utilities caused by dewatering or other operations or failure to use corrective or preventive procedures or methods.

8.2 Treatment System Monitoring

Treatment system influent and effluent monitoring will be performed in accordance with the requirements of Part 4 of the Draft 2016 RGP. These include:

- Monitoring of untreated influent and treated effluent during system startup;
- Monthly monitoring of untreated influent and treated effluent after the startup period;
- Treatment system shutdown monitoring of untreated influent and treated effluent;
- Analysis methods and minimum levels and detection limits as specified in the Draft 2016 RGP.

Analytical parameters shall be those required by USEPA in their February 28, 2017 approval of the NOC.

8.3 Treatment System Record Keeping and Reporting

Record keeping shall conform to the requirements the RGP.

Assuming that the discharge of construction dewatering effluent will last less than 12 months, Discharge Monitoring Reports will follow the requirements the 2016 RGP and any conditions USEPA attaches to approval of the NOC or Notice of Intent (NOI).

8.4 Notification to EPA and MassDEP

In addition to notification requirements in the Standard Conditions of the 2016 RGP, all operators must notify USEPA and MassDEP as soon as they have reason to believe:

- That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not otherwise limited in the permit and is referenced in 40 CFR §401.15; or
- Any other notification level established in accordance with 40 CFR §122.44(f) and State regulations.

9.0 SYSTEM SHUTDOWN AND EQUIPMENT REMOVAL

When the dewatering system is no longer required as directed by the Contractor, the pumping rate will be gradually decreased until the water table resumes a static level such that the velocity of the returning groundwater will be low enough not remove fines from the backfill placed between the excavation sidewall and the foundation. A Notice of Termination will be submitted to USEPA prior to shutdown of the dewatering effluent treatment system.

All equipment (pumps, wiring and piping) will be removed from dewatering wells prior to closure. Selected dewatering wells will be converted to groundwater monitoring wells to evaluate post-construction groundwater conditions. Dewatering well points will be closed by pulling the well casings and screens from the ground and filling the borehole from the bottom of the well to two feet above the average water table depth with a slurry mixture of Portland cement and 2 to 8 percent bentonite. The slurry will be delivered via a tremie pipe and allowed to cure for 24 hours. The portion of the borehole from the top of water table to the ground surface will be filled with silty sand.

Dewatering wells completed in bedrock will be closed by removing all pumps, wires and piping, and filing the portion of the borehole within the bedrock with a slurry mixture of Portland cement/2 to 8 percent bentonite delivered via a tremie pipe. The slurry mixture will be allowed to cure for 48 hours after which time the borehole from top of bedrock to a depth 2 feet above average depth to water table will be filled with a Portland cement/8% bentonite mixture via a tremie pipe and the well casing pulled from the ground. The grout will be allowed to cure for 24 hours after which time the remainder of the borehole will be filled to the ground surface with silty sand.

10.0 POST-CONSTRUCTION GROUNDWATER MANAGEMENT

Design plans of the proposed basement parking area include installation of a single interconnected sub-slab dewatering system consisting of perforated 4-inch-diameter PCV piping set 8 feet on center in 18-inch-deep, crushed stone-filled trenches at a pitch of 1/8" per foot. The perforated 4-inch pipe drains discharge to 6-inch-diameter solid PVC collector pipes, which drain to a common collection point located in the northern portion of the building. The drainage trenches are covered

with 8 inches of crushed stone. A 5-inch-thick reinforced floor slab underlain by a waterproof membrane overlies the 8-inch layer of crushed stone.

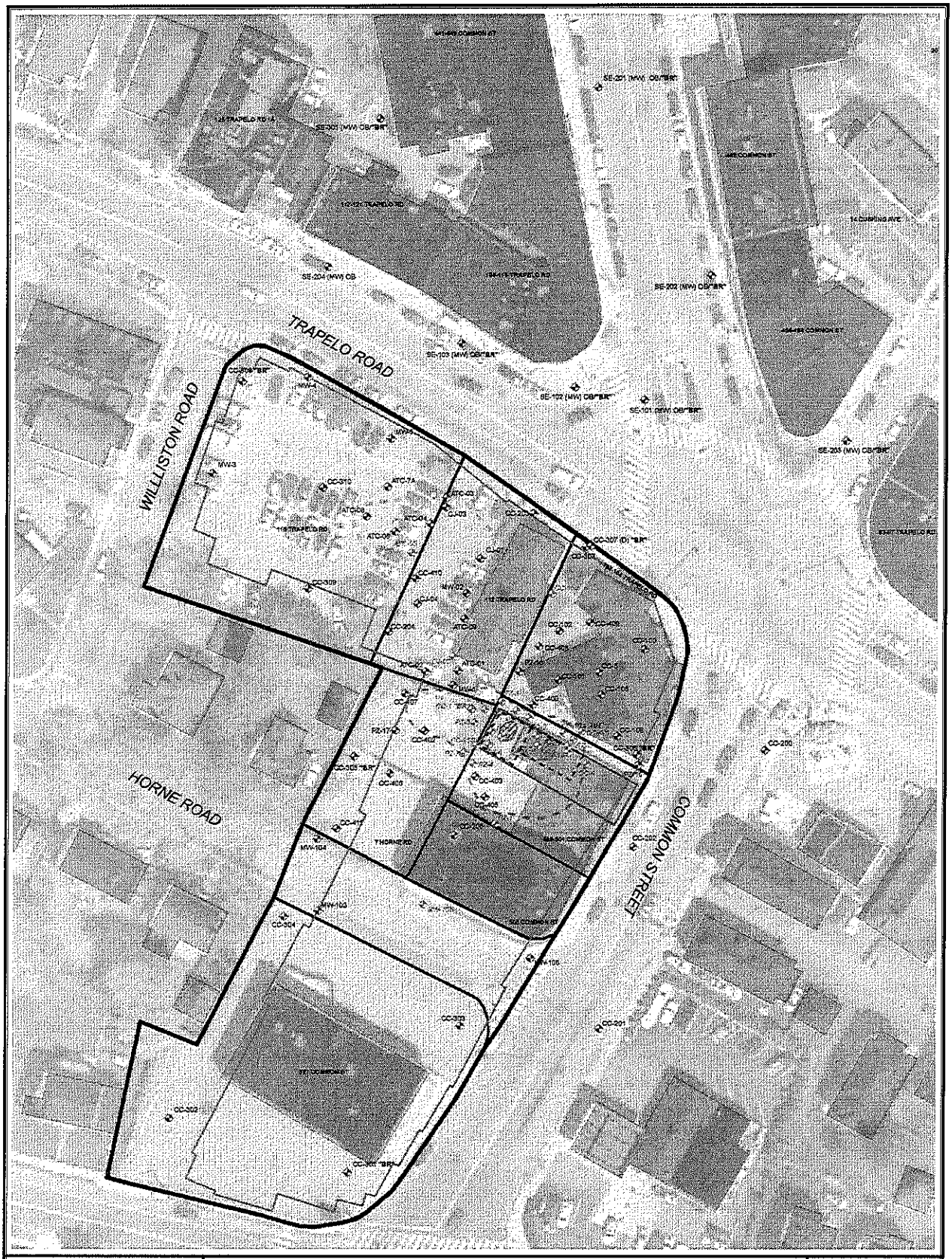
Groundwater discharging to the common collection point will be treated prior to discharge to the Town of Belmont storm drain system. The groundwater treatment system will include the following elements:

- 25-micron bag filters to remove fine sediment prior to treatment by chemical absorption;
- Removal of organic compounds by GAC filtration;
- Removal of metals and cyanide by Greensand Plus™;
- Flow totalizer.

Given that the post-construction sub-slab drainage system will likely be continually filled with groundwater, vapor sampling ports for soil vapor monitoring are currently not proposed for connection to the perforated piping or the crushed stone layer.

A NOI will be submitted to EPA for the continued discharge under the 2016 RGP. Treatment system startup and operational monitoring and recordkeeping will be performed in accordance with the 2016 RGP as described in Sections 9.2 and 9.3, respectively. Once concentrations of analytes detected in system influent samples are consistently equal to or below RGP effluent limitation levels, a NOC will be filed with USEPA to eliminate treatment and reduce or terminate effluent monitoring.

FIGURES



Comprehensive Site Plan

Cushing Village
Along Trapelo Road and Common Street
Belmont, Massachusetts

Figure 1

★ Site Location

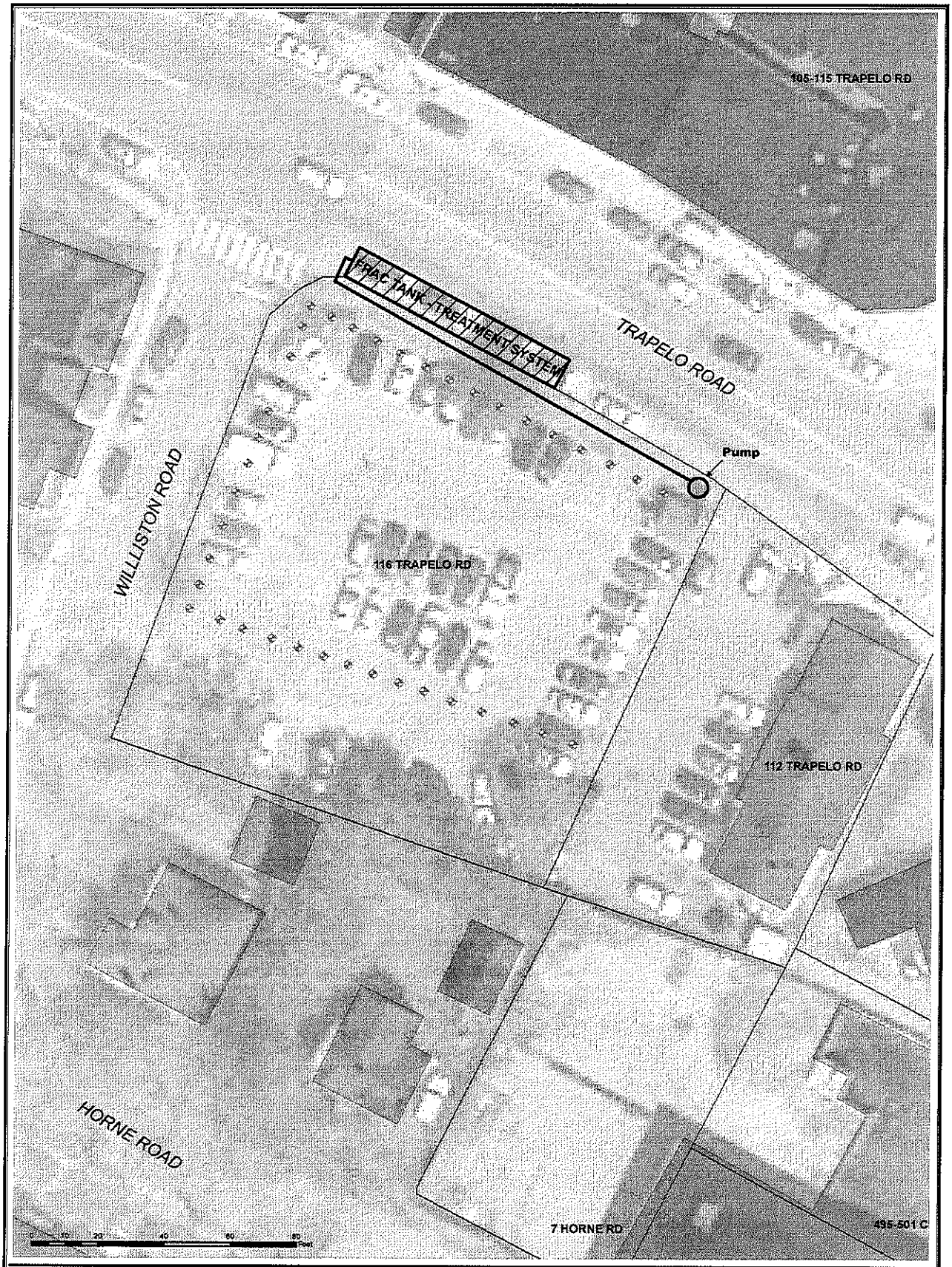
Date: 03/10/2017
Job #: R090
Created By: ALM

- Monitoring Well
- "BR" = Bedrock Well
- Destroyed Monitoring Well
- Approximate Extents of 2010 *in-situ* Chemical Oxidation Soil Blending
- Former Tops Cleaners Building Footprint
- SAGE Proposed Limits for Soil Blending
- Cushing Village
- Approximate Extent of petroleum impact (RTN: 3-20385)
- Approximate New Structure Footprint
- PCE Release Source Area

N W E S

SAGE ENVIRONMENTAL

Data Provided by MassGIS



Contruction Dewatering Plan

Cushing Village
Along Trapelo Road and Common Street
Belmont, Massachusetts

Figure 2

★ Site Location

Data Provided by MassGIS

Date: 03/09/2017
Job #: R090
Created By: ALM

0 10 20 40 Feet

◈ Proposed Dewatering Well Location

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