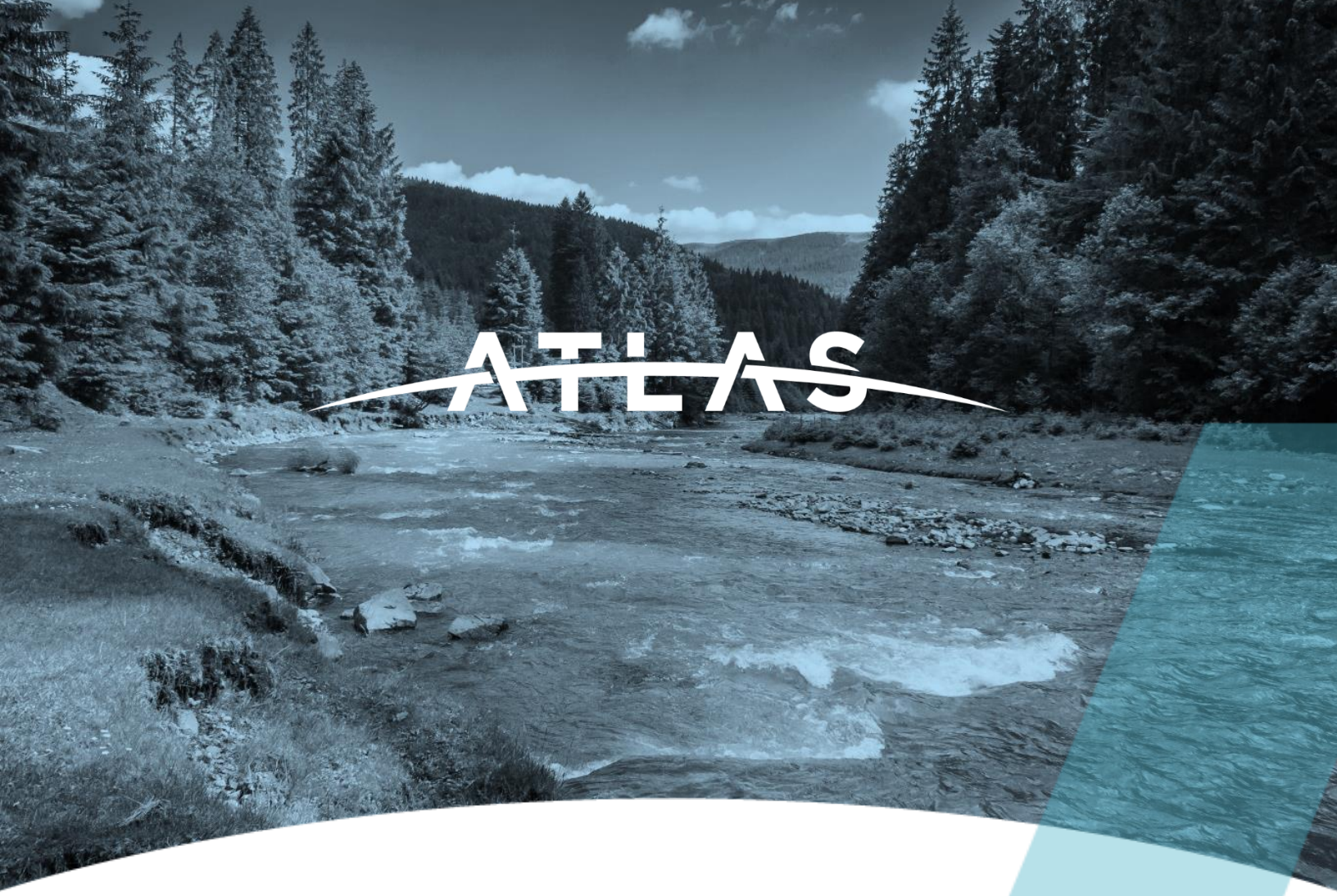

CORRECTIVE ACTION PLAN

ELMWOOD AVENUE RIGHT OF WAY

Burlington, Vermont 05401

VTDEC Site #2017-4734

PREPARED FOR:

Vermont Department of Environmental Conservation
Waste Management & Prevention Division
Davis Building - 1st Floor
One National Life Drive
Montpelier, VT 05620-3704

PREPARED BY:

Atlas Technical Consultants LLC
51 Knight Lane
Williston, VT 05495

May 17, 2022

May 17, 2022

KIM CALDWELL & MICHAEL NAHMIAS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WASTE MANAGEMENT & PREVENTION DIVISION
DAVIS BUILDING - 1ST FLOOR
ONE NATIONAL LIFE DRIVE
MONTPELIER, VT 05620-3704

Subject: **Corrective Action Plan**
Elmwood Avenue Right of Way
Burlington, Vermont 05401
VTDEC Site #2017-4734

Dear Ms. Caldwell and Mr. Nahmias,

Atlas Technical Consultants, LLC (formerly ATC Group Services, LLC) is pleased to provide the Vermont Department of Environmental Conservation this *Corrective Action Plan* for the Elmwood Avenue Right of Way in Burlington, Vermont.

If you have any questions, please call us at (802) 862-1980.

Respectfully submitted,
Atlas Technical Consultants LLC

Erik Urch
Senior Project Manager

Joseph J. Hayes, CPG, PG
Vermont Operations Manager

Attachment: Corrective Action Plan

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APPENDICES

1. INTRODUCTION

Atlas Technical Consultants, LLC (Atlas), formerly doing business as ATC Group Services, LLC (ATC), on behalf of the Vermont Department of Environmental Conservation (VTDEC), presents this Corrective Action Plan for the Elmwood Avenue Right of Way (ROW). This CAP includes the removal and replacement of a section of sewer pipe that has been contaminated by historical discharges from a former drycleaner at 222 Elmwood Avenue (Site #2017-4734). Replacement of the pipe media is intended to remediate elevated soil vapor contamination that is off-gassing from the pipe and impacting nearby residential buildings. This CAP will not address contamination that has been identified on the 222 Elmwood Ave property, and a future CAP for that source area will needed after additional investigation. This document was prepared at VTDEC's request in accordance with the VTDEC *Investigation and Remediation of Contaminated Properties Rule* (IRule, July 2019). ATC completed prior soil, soil vapor and sewer pipe sampling/replacement within the ROW, which culminated in an Evaluation of Corrective Action Alternatives (ECAA) Report dated March 17, 2021, which forms the basis of design for this CAP. Refer to **Figure 1** for a Vicinity Map, **Figure 2** for an Area Map, and **Figure 3** for a Site Plan.

2. CONCEPTUAL SITE MODEL

2.1 Site Description and History

Elmwood Avenue is a City road in the Old North End of Burlington, VT that is generally flat. The road is covered with asphalt which forms an impervious surface that limits stormwater infiltration and soil vapor exfiltration. A catch basin is located on the east side of the road in front of 222 Elmwood Avenue and conveys stormwater runoff from the road to the sanitary sewer system located beneath the middle portion of Elmwood Avenue via a combined sewer/stormwater system.

Buildings along the road are mainly residential with some current commercial operations, the closest of which is Gadue's Dry Cleaning located at 222 Elmwood Avenue (Site #2017-4734). This facility is not currently used for drycleaning, but for storage and wet cleaning. Wastewater from this facility and all other buildings up to 167 Elmwood Avenue is discharged to the sanitary sewer system via lateral connections. The sewer main consists of 10-12 inch vitrified clay pipe (VCP) positioned between 11-12 feet below ground surface (fbgs) and conveys flows to the north.

In September 2018, the City of Burlington completed a camera survey of the sewer main that revealed an approximately 40-ft section of defects (root penetrations, water level sags, and joint offsets) in front of the property at 230 Elmwood Avenue. This section of the pipe was removed, sampled and replaced in November 2020, details of which are provided later. Other underground utilities include water and gas mains and connections.

2.2 Site Geology and Hydrogeology

According to the Agency of Natural Resources (ANR) Natural Resources Atlas (NRA), native surficial soils at the Site include pebbly marine sand. Soil boring observations generally indicate road subbase and fill materials to five fbgs following by cross-bedded deltaic sands ranging from fine to coarse-grained to a maximum explored depth of 30 fbgs. Bedrock geology consists of Dunham Dolostone, which is a buff- and pink-mottled and massive, or light-gray, pinkish-gray-weathering, and massive to poorly bedded dolostone. Depth to bedrock is reported to be >75 feet in the project area. Groundwater was not encountered and is likely >75 fbgs.

2.3 Source(s), Release(s), Fate & Transport

Previous investigations conducted by ATC and others indicate that tetrachloroethene or perchloroethene (PCE), which is a common dry cleaning solvent and dense non-aqueous phase liquid (DNAPL), has been detected in sewer pipe media, soil, soil vapor, subslab soil vapor, and indoor air in and around the Elmwood Avenue ROW. Trichloroethene (TCE), which is likely a degradation product of the PCE, and other volatile organic compounds (VOCs), have also been detected to a lesser extent.

Site data and history indicate that the contamination appears to originate from 222 Elmwood Avenue (Site #2017-4734), which has operated as a dry cleaner with documented PCE usage since the 1950s, until 1991. It is likely that spent PCE waste materials historically entered the sewer system from 222 Elmwood Avenue and were directed north through the pipe. The presence of PCE in samples of the sewer pipe, up to concentrations of 768,000 micrograms per kilogram (µg/kg), suggests the VCP pipe media has adsorbed PCE, which is off-gassing to soil vapors. Actual secondary release(s) of PCE from the pipe into subsurface soils is less apparent from the dataset; however, cannot be ruled out due to soil conditions outlined later.

The horizontal extent of shallow soil vapor contamination (generally 2-3 fbgs) along the Elmwood Avenue ROW is well known from the existing dataset. Refer to **Figure 2** which illustrates the known extent of the shallow vapor plume and buildings that are known to have been impacted. The vertical profile is less known as deeper soil vapor (≥5 fbgs) has only been assessed immediately adjacent to the sewer line defect area (ATC-3 and ATC-4). However, the limited vertical soil vapor data indicates that soil vapor contamination extends into the deeper soil profiles at lower concentrations to a maximum assessed depth of 30 fbgs and that differential pressures may be driving advective flow upward from deeper horizons.

The highest PCE/TCE concentrations in soil have been detected under the slab at 222 Elmwood Avenue (up to 120,000 µg/kg). Significantly lower concentrations (up to 75.6 µg/kg) have been detected in soils within the ROW with the highest concentrations at 2-3 fbgs which appears to be the result of adsorption from vapor accumulation beneath the impervious road surface. Fraction organic carbon (FOC) is generally low in subsurface soils indicating that contaminant adsorption from release(s) from the sewer pipe may be limited to discrete finer-grained horizons, which can result in difficulties in pinpointing residual mass areas in this geologic setting.

2.4 Sensitive Receptors and Exposure Pathways

The primary sensitive receptor of the sewer line-related contamination is indoor air via the vapor intrusion pathway. To date, VTDEC has identified 17 residential properties where indoor air concentrations of PCE exceed applicable standards (see **Figure 2**). Other properties in the vicinity have the potential to be impacted but have not yet been tested. Mitigation has been completed for some impacted residences and design and implementation is in progress for several others. Underground utilities and worker exposure during utility upgrades are also a concern and can provide preferential pathways for contaminant migration. It is unknown if groundwater is impacted as no groundwater sampling has been conducted to date; however, the area is served by municipal water services, so there is likely a low probability of exposure to the contamination via ingestion. It should be noted that two private wells are depicted on the Natural Resources Atlas (NRA) to the west of the project area; however, these appear to be miss-located as the well completion reports indicate "Burlington Electric Department", which appears to refer to the generation plant at the Intervale located approximately ½ mile to the northeast.

Refer to **Appendix A** for historic soil and soil vapor data tables and figures.

3. PUBLIC NOTICE

A public notice is required under this CAP. The public notice form that is required to be filled out and sent to all abutting property owners following VTDEC approval of the CAP is provided in **Appendix B**, along with a list of properties that will receive the notice, and an updated fact sheet. VTDEC will be handling the notification mailings.

3.1 Additional Public Outreach

The Environmental Professional (EP) shall notify the City of Burlington Department of Public Works (DPW) at least 14 days prior to implementation of the CAP and the City shall notify the public on Elmwood Avenue via their standard public outreach program. The EP will coordinate with DPW Water Resources Division whenever a water service connection is disrupted with the assumption that the City prefers to avoid service disruption. If this avoidance cannot be maintained, 72 hours of advance notice is preferred by the City and the interruption should be coordinated directly with DPW Water Resources.

4. PERFORMANCE STANDARDS

The objective of the corrective action is to reduce or eliminate vapor phase contamination stemming from the sewer line that is currently impacting offsite residential buildings in the area. This will be attempted by removing contaminated sewer pipe that appears to be a source of vapor phase contamination in the area. The extent of sewer pipe that is targeted for removal is estimated based on the results of the prior sewer line removal coupled with prior soil vapor studies with the assumption that the correlation between contaminated sections of the sewer pipe and adjacent elevated soil vapors represents causation. PCE concentrations along this section of sewer line were observed to be greater than 10,000 µg/m^3 and the southern end of the sewer line section is based on where the sewer lateral from 222 Elmwood Ave enters the main (except for the space between the lateral and the manhole). Additional removals and/or other remedial options may be required to meet the objective of mitigating impact to offsite building based on the performance of this corrective action.

Remedial performance will be evaluated through sampling of soil vapor in the area prior to and following the proposed removal project to determine if a reduction of soil vapor is realized in comparison to pre-removal conditions. The pre-removal sampling will also be compared to previous soil vapor sampling that was conducted by Weston and ATC in 2019 prior to the 2020 sewer line removal effort. The remediation will be deemed a complete success if soil vapor is reduced to below Vapor Intrusion Standards for Subslab Soil Gas (VIS-SSSG) Resident values in all vapor points and is maintained during follow up events. The more likely scenario is soil vapors may be reduced a certain percentage and that an equilibration period may be required to realize significant reductions. It is also unknown what influence the presence of the historic dry cleaner at 222 Elmwood Avenue has on the overall concentrations in soil vapor in the area. Soil vapor emanating from this property may follow preferential pathways to impact soil vapor away from the property itself. It is Atlas' understanding that additional performance monitoring at the impacted offsite residential buildings will be completed under separate contract.

5. PERMITS

The GC will comply with all City bonding, permitting, traffic control, utilities and other specifications required to complete the work. This project assumes weekday hours of operation between 7AM and 5PM. The following permits are required to complete the corrective action:

- City of Burlington Excavation Permit
- City of Burlington Stormwater Permit
- Digsafe

6. REMEDIAL IMPLEMENTATION PLAN

6.1 Health and Safety Requirements

All workers handling contaminated sewer pipe shall possess OSHA Hazardous Waste Operations (HAZWOPER) certifications. Different levels of training are required, based on the tasks to be performed, and thus the potential exposure to hazardous materials at the job site. A Site-Specific Health and Safety Plan (HASP) as required by 29 CFR1910.120 is provided as **Appendix C**. The GC will be responsible for the implementation of the HASP and for ensuring all subcontractors and other personnel working at the Site are OSHA-compliant.

The General Contractor (GC) and other site workers are responsible for full compliance with the Vermont Occupational Safety & Health Agency (VOSHA) on the Project, evaluations and personal protective equipment (PPE) for its employees as required for this project, including but not limited to Job Safety Analysis, personal exposure monitoring, written health and safety program, medical monitoring and issuing of personal protective equipment. The Site Superintendent for the GC, as well as equipment operators and any workers entering the excavation, will need to be current on the 40-hour HAZWOPER training regardless of the OSHA requirements.

6.2 Traffic Control

The GC will submit a traffic control plan as a component of City excavation permit requirements. As consistent with the previous sewer line removal project, this assumes the entire street will be blocked off for local traffic only from Cedar Street to the south to Spring Street to the north with final determination by the City. The GC will provide traffic control and flagger info, work zone and signage location and a pedestrian detour plan as required in accordance with City permit requirements.

6.3 Sewer Pipe Excavations

The GC under supervision of the EP shall implement the CAP in accordance with details set forth in this CAP narrative and the design drawings/specifications provided in **Appendix D**. The GC shall coordinate with the City to block or pump the sewer flow in the upstream manhole to make sure no sewer flows enter the excavations during construction. All excavations shall proceed upstream to downstream (south to north) to ensure sewer flow does not enter the excavations from lateral connections, which shall be blocked as encountered. Any affected residences will be notified in advance in accordance with Section 3.0.

The GC shall sawcut the existing pavement in an approximately 1,280 square foot (SF) area (160 ft x 8 ft) as illustrated on Sheet C2.2 in Appendix D. The asphalt will be stripped, loaded into dump

trucks, and transported to an offsite facility for recycling in accordance with standard construction practices.

The GC shall then excavate soils down to the existing sewer pipe, estimated at 10-12 fbgs, utilizing trench boxes for shielding in accordance with the HASP. The length of the excavations shall be coordinated so that all excavations are completed and backfilled each day so that no open excavations are left overnight. The soils will be temporarily staged onsite and returned to the excavation as backfill. Any excavated soil volumes that cannot be stored onsite due to space restrictions shall be transported to the temporary storage location in accordance with Section 6.8. Based on results of the prior sewer line excavation, it is not expected that these overburden soils will be contaminated. However, this should be verified by the EP via periodic field-screening of these soils during excavation in accordance with Section 6.4. If any soils exceed field-screening thresholds outlined in Section 6.4, these soils should be segregated and temporarily stored offsite in accordance with Sections 6.6-6.8.

The GC shall then remove each existing two-foot VCP pipe section from the excavation and stage them onsite on two layers of plastic for field-screening and sampling by the EP, as outlined in Sections 6.4 and 6.5. All pipe sections will be labeled and photographed. Following completion of the field-screening and sampling, the VCP pipe sections shall be hauled to the approved offsite staging area in accordance with Sections 6.6-6.8.

The GC shall then excavate soils two feet beneath the pipe and the EC shall field-screen each bucket spoil as outlined in Section 6.4. Soils that are deemed contaminated based on field-screening results shall be segregated and hauled to an approved offsite staging area in accordance with Section 6.6-6.8. Non-contaminated soils shall be temporarily staged onsite, and returned to the excavation as backfill. Under no circumstances shall these segregated piles be mixed.

The GC shall then replace the removed sections of existing sewer pipe and any service connections in accordance with the design drawings/specifications in **Appendix D**. The City of Burlington will pay for the replacement piping materials and fittings. The GC shall coordinate directly with the City on this matter. The GC shall then backfill the excavations with a combination of native materials and delivered clean fill, as required, and the backfill shall be compacted in one foot lifts in accordance with the design drawings/specifications in **Appendix D**. As outlined earlier, all excavations shall be backfilled and compacted by the end of each day, so that there are no open excavations left overnight.

The GC shall excavate materials in a manner to minimize fugitive dust and particulate emissions. If visible particulate emissions are generated during soils and materials excavation, the GC will utilize various and appropriate methods (including wetting or appropriate tarps or covers) to ensure that visible dust and particulate emissions are contained within the excavation itself, and that such emissions do not migrate outside the immediate excavation.

The EC shall inspect all excavations for the presence of unforeseen subsurface conditions. Such unforeseen conditions might include the presence of concrete vaults, underground storage tanks (USTs), dry wells, or large diameter concrete or steel piping. Should the presence of unforeseen conditions be identified by the EC, such conditions shall be immediately brought to the attention of VTDEC for further inspection, documentation, and a determination as to additional work, if any, as required.

The EC shall oversee Construction Inspection Services to be performed by a qualified engineering firm to meet City requirements. The engineer shall possess at least a 24-hour OSHA HAZWOPER certification to enter the site for the inspection work. See **Appendix E** for the City's specifications.

If solid waste is encountered during the course of excavation activities, the GC shall coordinate a staging area for the segregation of soils and solid waste. Solid waste shall be removed from the excavated soils and stockpiled separately at the offsite staging area pending offsite disposal. Following the segregation of any solid waste, the remaining soil shall be returned to the excavation or added to the contaminated soil waste stream as appropriate and under the direction of the EC.

The GC shall repave the asphalt in accordance with details outlined in **Appendix D** and coordinate with the City on the need to perform a post-construction camera survey.

6.4 Soil and Pipe Field-Screening and Sampling

The EP shall field-screen soils and sewer pipe samples utilizing a PID equipped with a 10.6 eV lamp. The PID will be calibrated utilizing 100 ppmv isobutylene gas and referenced to PCE. Field-screening will also include visual and olfactory observations to document any potential odors and/or staining/discoloration that may indicate the presence of contamination. The field-screening samples will be placed in a baggie (1/2 full), agitated and allowed to stabilize for 1-2 minutes. If the ambient temperature is at or below freezing conditions during the field-screening activities, additional stabilization (up to 5 minutes) may be required within a heated vehicle. PID headspace readings will be collected from the baggies following stabilization and recorded in a log book.

The EP shall field-screen overburden soils above the existing pipe intermittently at their discretion based on visual and olfactory observations, and all excavator buckets two feet below the pipe. Any of these soils that exceed the 10 ppmv threshold previously established for this Site by VTDEC will be segregated and managed in accordance with Sections 6.5 and 6.6.

The EP shall collect sewer pipe samples from each of the two-foot sections immediately after their removal from the trench by breaking the VCP material into small shards with a rock hammer or other similar. If there is any visual or olfactory evidence of contamination in/on the pipe section, the samples shall be collected from those locations. If not, the samples shall be collected from the bottom of the straight end of the pipe where it fits into the belled section of the adjoining section. Any samples that exceed the 10 ppmv PID threshold previously established for this Site by VTDEC will be retained for offsite laboratory sampling, outlined below. For planning purposes, this CAP assumes one pipe sample will be retained for every 5th two-foot pipe section, which equates to 16 retained samples. Any sampling implements shall be decontaminated with alconox and water between samples.

The GC under the direction of the EP shall collect discrete soil samples in the trench directly beneath each two-foot section of VCP pipe immediately following removal of the pipe. The samples shall be collected beneath the connection joint which is the most likely release point. Additional soil samples shall be collected beneath any obvious cracks or other defects in the pipe and in any soils that exhibit visual or olfactory evidence of contamination. The samples shall be collected utilizing a small shovel or trowel and immediately brought to the surface utilizing a bucket on a string or other safe method and given to the EC for field-screening. Any samples that exceed the 10 ppmv PID threshold previously established for this Site by VTDEC will be retained for offsite laboratory sampling, outlined below. For planning purposes, this CAP assumes one pipe

sample will be retained for every 5th two-foot pipe section, which equates to 16 retained samples. Any sampling implements shall be decontaminated with alconox and water between samples.

Following field-screening outlined above, the EC will immediately deposit any retained field-screening samples into the appropriate bottle ware as required for field-preservation by EPA Method 5035A (two DI vials, methanol vial, and dry weight bottle). The sewer pipe shards will be completed as above but may require a separate jar with an airtight seal if shard sizes prohibit EPA Method 5035A extraction methods. Any crushing of the sewer pipe media for analyses will be performed at the lab under a controlled environment to limit the loss of volatiles. Crushing onsite for sample size reductions will be minimized to the extent possible. All samples shall be stored on ice immediately after collection and transported under chain of custody to a certified environmental laboratory for analyses of PCE and TCE via EPA Method 8260. Duplicate samples will be collected from one sewer pipe sample and one soil sample for a total of 18 soil samples and 18 pipe samples.

All soil samples that exceed 10 ppmv and all pipe samples will also be retained for composite sampling, as required for waste characterization for offsite disposal planning. As consistent with the previous sewer line removal project, this CAP assumes all 80 of the VCP sections will require offsite disposal. The CAP also assumes none of the soils will require offsite disposal. See Section 7 for additional details.

6.5 Soil Transport and Handling On-Site

The GC shall load and dump soils and fill materials onsite in a manner that minimizes the generation of visible emissions. This will likely require that excavated materials are sufficiently moist such that visible emissions, if any, are present only within the dump body or loader bucket.

If visible particulate emissions are generated during the loading, handling or transportation of soils, the GC shall utilize various and appropriate methods (including wetting and/or appropriate tarps or covers) to ensure that visible dust and particulate emissions are contained within the dump body or excavation bucket.

The GC shall closely monitor and maintain dust and erosion control measures to ensure that site soils and fill are not tracked off the property and that such materials do not migrate off the property through water or wind erosion.

The GC shall minimize truck idling time.

The GC shall inspect all site work equipment, including all excavators, loaders, dump trucks and other mobile or stationary equipment on a daily basis and the equipment shall be maintained in such a manner as to minimize the potential for a release of petroleum fuels or oils on the Site. In addition, the GC shall use other construction-related fluids including glues, epoxy, and concrete form oil, for their intended purpose only and these materials shall be stored in such a manner as to minimize the potential for a release to the environment.

The GC shall report any release of motor fuels, oils, or construction-related fluids to the Site to the EP immediately. The GC shall maintain a spill clean-up kit onsite and shall be prepared to respond with its own resources or subcontracted services to clean-up a spill/release of petroleum products and/or chemicals.

6.6 Soil Transport and Handling Off-Site

The GC under the direction of the EP shall load any soils that exceed the 10 ppmv PID threshold previously established for this Site by VTDEC into dump trucks for transport to the approved offsite staging area. Any soils that are below 10 ppmv shall be reused as backfill. The EP, under consultation with VTDEC, shall determine if the segregated soils exceeding 10 ppmv should be returned to the excavation as backfill or disposed offsite following proper waste characterization procedures. For planning purposes, this CAP assumes all excavated soils will be backfilled, which is consistent with the previous sewer line removal project.

The GC shall instruct transporters, all of which will be appropriately permitted to haul non-hazardous solid waste, of the best management practices (BMPs) for the transportation of such materials, including proper tarping of dump bodies or recycling/roll-off containers. Any entity hauling soils offsite shall be compliant with any applicable local, State, and Federal permits or other regulatory requirements. All loose materials shall be removed from truck bodies, earth moving equipment and roll-off containers prior to such equipment leaving the Site.

6.7 Off-Site Staging Area

The GC shall load any contaminated soils and old sewer piping as designed by the EP into trucks for hauling to an approved offsite staging area. One offsite location (Whitcomb's Quarry) that meets VTDEC requirements for this purpose is provided for consideration (see **Appendix F**); however, owner and VTDEC approval for this location is pending. The selected offsite staging area shall comply with IRule setbacks utilizing VTDEC's *Management of Non-Hazardous Contaminated Soil Request Form*, attached as **Appendix F**, which shall be completed and submitted by the EP to VTDEC for pre-approval before moving any soils. No offsite storage or stockpiling shall occur between December 1 and April 1 unless otherwise approved by VTDEC.

Any contaminated soils or old sewer piping transported to the offsite location shall be placed on two layers of polyethylene sheeting (minimum 6 mil) or stored within lined rolloffs. At the end of each day, the materials shall be covered with polyethylene sheeting (minimum 6 mil). The polyethylene sheeting shall be secured by use of weights such as tires to prevent the wind from dislodging the sheeting and exposing the materials. A berm should be constructed around any temporary soil piles and public access shall be prohibited through no trespassing signs and other means.

If the materials are wet, appropriate measures should be taken to prevent leakage to the ground surface. The GC shall install appropriate anti-tracking measures (e.g. anti-tracking pads, coarse gravel, etc.) at the offsite staging area to ensure that all vehicles and mobile equipment that have entered the storage area do not track soils and fill materials from the storage area out onto adjacent public roadways at any time.

The number of truck loads and estimated volume temporarily staged at the offsite location will be provided to the EC by the GC. Once all the materials are removed from the offsite location to an approved disposal facility, the polyethylene sheeting shall be properly disposed of by the GC and the area cleaned of any soil or debris.

6.8 Decontamination Procedures

Any equipment or tools that come in contact with contaminated materials shall be decontaminated prior to leaving the Site. Decontamination shall consist of scraping loose any contaminated materials from the equipment and pressure washing. The water used for pressure washing shall be allowed to seep back into the ground at the excavation. Additional details are provided in the HASP.

6.9 Soil Vapor Monitoring

Prior to any excavations outlined above to evaluate pre-excavation soil vapor conditions in the area, the EC shall oversee the installation of up to nine soil vapor monitoring points (SVMP-1 through SVMP-109) by an environmental drilling firm at proposed locations depicted on **Figure 4**. These locations were previously determined during coordination with VTDEC. Any adjustments to these locations, if required, shall be approved by VTDEC. The EC shall comply with any City permit, bonding and traffic control requirements as needed to perform the work.

The points shall be installed utilizing hand tools with vacuum extraction methods to assist in removing boney fill materials. During advancement, subsurface soils shall be logged continuously and a PID shall be utilized to measure total organic vapors (TOVs) every one foot. Any visual or olfactory indications of contamination (i.e. odors, staining, discoloration) shall also be noted. Additional discrete PID readings shall be collected as required based on the visual/olfactory results.

One soil vapor monitoring point shall be installed at each location at an approximate depth of three fbgs, which generally corresponds with previous soil vapor samples collected during the 2019 EPA study. Upon achieving the required depth, a 6-inch long stainless steel vapor implant shall be installed and connected to Teflon™-lined tubing that shall be capped and shall extend to the surface. The implant shall be surrounded by glass beads followed by a minimum two-inch layer of driller's sand. The remaining annulus shall be sealed with hydrated granular bentonite. The points shall be completed flush to grade with protective well covers in accordance with City specifications. Other appropriate installation methodologies can be explored with final approval by VTDEC.

All drilling spoils shall be returned to the boreholes to the extent practicable. If any spoils cannot be returned to the subsurface, offsite disposal requiring same-day removal will be required as waste cannot be stored within the ROW pending disposal. This would also require coordination with the City to sign the waste profile and manifest. All points shall be located with a global positioning system (GPS) device or surveyed relative to existing site datum.

Each vapor point shall be leak tested by injecting helium into a shroud that covers the points and measuring the helium concentrations both within the shroud and within the vapor point. The points shall be considered tight if the helium concentration within the vapor point is <10% of the shroud. If not, additional steps shall be taken to ensure the points are not introducing atmospheric air into the samples. The points shall then be purged of at least five tubing volumes and field-screened with a PID prior to sampling. Differential pressure readings between the subsurface and outdoor air shall be recorded at each location with a micro-manometer. Other appropriate sealing and purging methodologies can be explored with final approval by VTDEC.

Soil vapor samples shall then be collected from each of the proposed soil vapor points utilizing a 6 liter canister in accordance with EPA Method TO15. The samples shall be collected over a 30-

minute period at rate of 200 ml/min utilizing laboratory-calibrated flow controllers. The samples shall be analyzed at a certified environmental laboratory for PCE and TCE.

Another round of sampling shall be performed approximately six months following completion of excavation activities to evaluate post-excavation soil vapor conditions. This timeframe assumes a conservative equilibration period factoring in potential seasonal fluctuations.

7. WASTE MANAGEMENT

During the previous sewer pipe removal project, the existing sewer pipe was disposed offsite as hazardous waste (codes D040 and D039) as the waste contained elevated PCE/TCE (up to 768 ppm). The prior hazardous waste manifest is attached in **Appendix G**. This CAP assumes the proposed 160 foot sewer pipe section (80 individual two-foot sections) will be shipped offsite in a similar fashion utilizing cubic yard boxes at an estimated weight of four times[1] the previous (12 boxes at an approximate total of 3,200 lbs). Alterative disposal options and locations can be explored by the EC with final approval by VTDEC.

The EP shall collect an appropriate number of composite samples for waste characterization for any soils that exceed the 10 ppmv PID threshold previously established for this Site by VTDEC that are not returned to the subsurface. The composite sample(s) shall be stored on ice and transported to a certified environmental laboratory under chain of custody. The sample(s) shall be analyzed for the full waste characterization analytical suite required by Casella Waste Systems for acceptance at their Coventry, VT landfill (NEWS VT), as in our experience, their list provides the most flexibility for evaluating disposal options. Refer to **Appendix G** for Casella's waste profile requirements.

The waste shall be loaded by the GC and hauled to the final disposal facility following receipt of waste characterization results and after waste profiling is completed and facility acceptance is granted. This CAP assumes the waste shall be characterized as non-hazardous special waste and will be hauled to the NEWS VT landfill, although other suitable disposal options can be explored with final determination by VTDEC. In an email dated October 7, 2020 during coordination of the previous sewer line removal project, VTDEC indicated that the waste is not a listed hazardous waste and that a contained in determination and/or hazardous waste disposal does not apply to this material. Refer to **Appendix G**.

Any disposal receipts and/or waste manifests for all waste transported for offsite disposal shall be provided to the EP for inclusion in the final report.

8. IMPLEMENTATION SCHEDULE

The CAP approval process typically includes 30 days for VTDEC to review the draft CAP and then a 30 day public comment period following VTDEC's approval of the draft CAP. Once the 30 day public comment period has been met, the CAP will be final and implementation can commence. The City of Burlington will also review the CAP concurrent with VTDEC review. The schedule for the implementation of the CAP will be determined following completion of the EP/GC bidding and selection process to be completed by VTDEC.

It is estimated that the sewer line removal and replacement project will take 10 days to complete. The soil vapor point installations and pre-sewer line work vapor monitoring should take two days

[1] The previous removal was 40 feet of pipe while the proposed is 160 ft of pipe.

and should be completed at least one week prior to the sewer line work. The post-sewer line work vapor monitoring should be completed six months after the sewer line work and should take one day to complete. The final report should be submitted within 90 days of completion of the sewer line work and post-sewer line work vapor monitoring should be reported to VTDEC as a separate abbreviated letter report within 45 days of receipt of the final laboratory report.

9. INSTITUTIONAL CONTROL PLAN

An institutional control plan is not applicable for this CAP since the work will be performed in a municipal roadway where the City is an impacted third party, and the work will not address contamination located at the suspected source location (222 Elmwood Avenue). If any residual contamination that cannot be removed is identified within the roadway at the conclusion of the project, these areas will be outlined in the final report, outlined below, with the understanding that the responsible party (RP) will comply with any institutional control requirements as part of environmental management on the source property.

10. CORRECTIVE ACTION CONSTRUCTION COMPLETION REPORT

Within 90 days of completion of construction activities associated with the CAP, the EP shall submit a Corrective Action Construction Completion Report to VTDEC, City of Burlington, and other interested parties as needed, and the report shall comply with Section 35-608 of IRule.

11. COST ESTIMATE

A preliminary breakdown of estimated costs to complete CAP implementations is included as **Appendix H**. These costs may be adjusted based on the results of the bidding and selection process to be completed by VTDEC.

12. SUBCONTRACTORS

The EP and subcontractors that will be implementing the CAP is unknown at this time.

13. SIGNATURES & CERTIFICATION

This report has been prepared by the employees of Atlas Technical Consultants, LLC whose signatures appear below. Requests for information on the contents of this report should be directed to these individuals.

I certify under penalty of perjury that I am an environmental professional and that all content contained within this deliverable is to the best of my knowledge true and correct.

Prepared by:

Erik Urch
Senior Project Manager

Joseph J. Hayes, CPG, PG
Vermont Operations Manager

Nate Berube, P.E.
Professional Engineer
VT License #74152

FIGURES

VERMONT

Figure 1: Vicinity Map

Vermont Agency of Natural Resources

vermont.gov

LEGEND

- Hazardous Site
- Hazardous Waste Generators
- Brownfields
- Salvage Yard
- Aboveground Storage Tank
- Underground Storage Tank (w
- Dry Cleaner
- Private Wells
  - GPS Located
  - Screen Digitized
  - E911 Address Matched
  - Welldriller/Clarion
  - Unknown Location Method
  - Incorrectly Located
- Parcels (standardized)
- Roads
  - Interstate
  - US Highway; 1
  - State Highway
  - Town Highway (Class 1)
  - Town Highway (Class 2,3)
  - Town Highway (Class 4)
  - State Forest Trail
  - National Forest Trail
  - Legal Trail
  - Private Road/Driveway
  - Proposed Roads

178.0 0 89.00 178.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 292 Ft. 1cm = 35 Meters

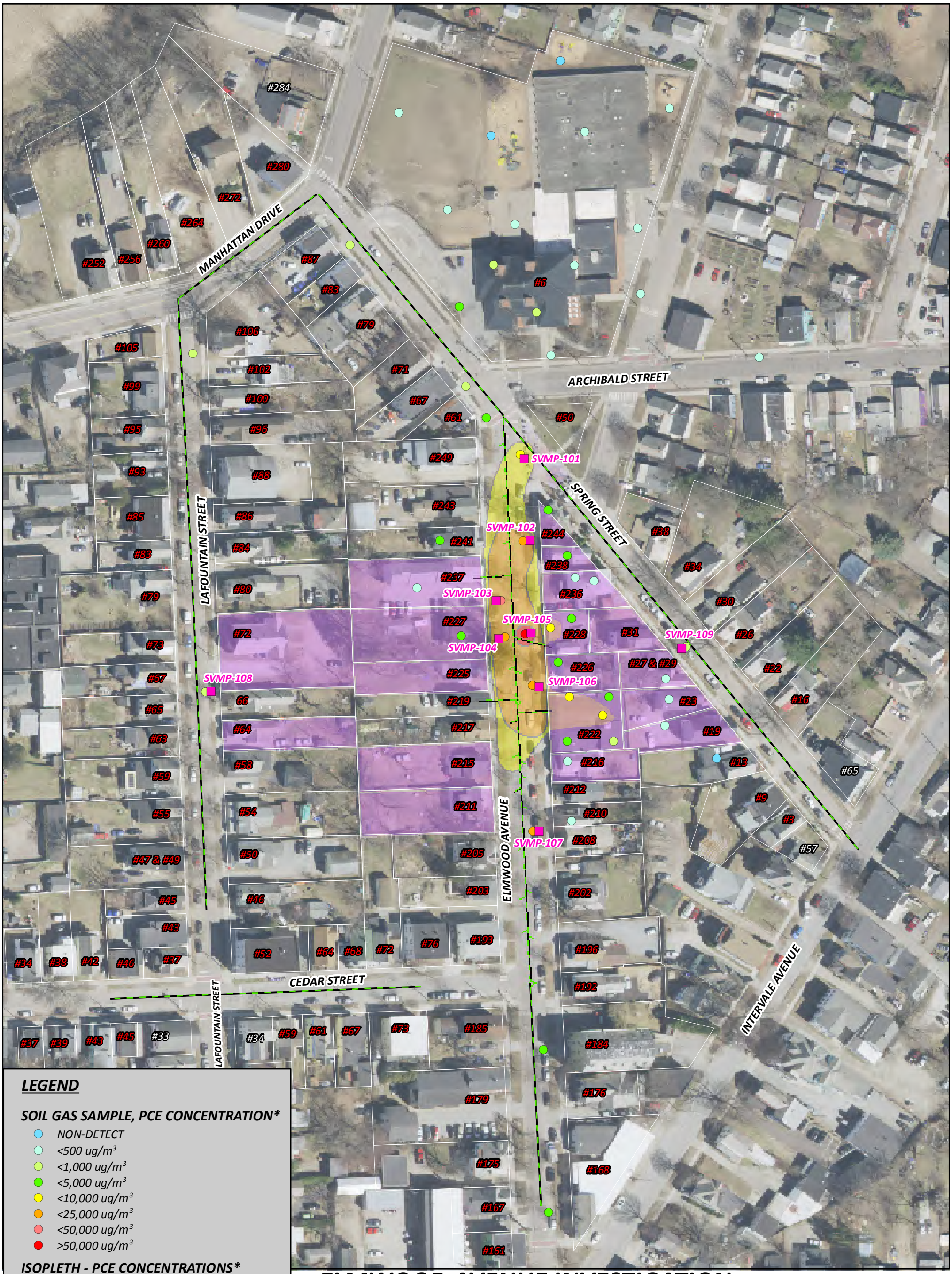
THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

NOTES

Elmwood Avenue
Burlington, VT
SMS Site #2017-4734

Project Area (approx)



LEGEND

SOIL GAS SAMPLE, PCE CONCENTRATION*

- NON-DETECT
- <500 ug/m³
- <1,000 ug/m³
- <5,000 ug/m³
- <10,000 ug/m³
- <25,000 ug/m³
- <50,000 ug/m³
- >50,000 ug/m³

ISOPLETH - PCE CONCENTRATIONS*

- >50,000 ug/m³
- >10,000 ug/m³
- >5,000 ug/m³

* SOURCE: WESTON SOLUTIONS (AUGUST 2018)

- PROPERTY BOUNDARIES
- PROPERTIES WITH EXCEEDANCES OF PCE IN INDOOR AIR
- #249 E911 ADDRESS TO RECEIVE PUBLIC CAP NOTICE
- SEWER LINE
- PROPOSED SOIL VAPOR MONITORING POINT

ELMWOOD AVENUE INVESTIGATION

ELMWOOD AVENUE, BURLINGTON, VERMONT

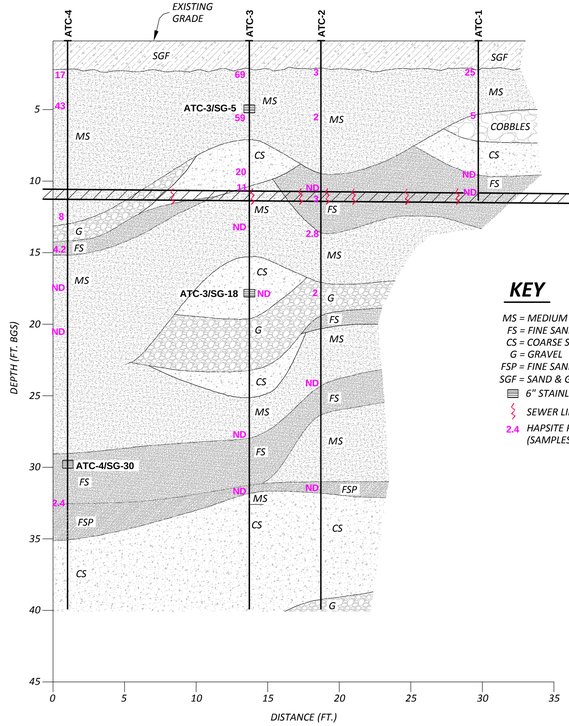
FIGURE 2: AREA AND ABUTTERS MAP

N W E S

0 50 100 200 300 400 Feet

Map Generated: 1-12-22

ATLAS



GEOLOGIC CROSS SECTION

SCALE
1" = 5' (HORIZ.)
1" = 5' (VERT.)

KEY

MS = MEDIUM SAND
FS = FINE SAND
CS = COARSE SAND
G = GRAVEL
FSP = FINE SAND WITH PERCHED WATER
SGF = SAND & GRAVEL FILL
6" STAINLESS STEEL VAPOR IMPLANT
SEWER LINE IMPERFECTION POINT (ROOTS, CRACKS, SAGS)
2.4 HAPSITE PCE IN SOIL (ug/kg)
(SAMPLES COLLECTED 12/9/19 & 12/12/19)

SITE PLAN

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LEGEND

PROPERTY LINE (APPROX.)
SEWER LINE
WATER LINE
GAS LINE
STORM DRAIN LINE
SEWER MANHOLE
STORM CATCH BASIN
UTILITY POLE
SEWER LINE IMPERFECTION POINT (ROOTS, CRACKS, SAGS)
SOIL VAPOR POINTS (WESTON SOLUTIONS, 2018)
SOIL VAPOR POINTS (THE JOHNSON COMPANY, 2018)
MEMBRANE INTERFACE PROBE (VHB, 2019)
SOIL BORING (ATC, DECEMBER 2019)
SOIL VAPOR POINT (ATC, DECEMBER 2019)

ISOPLETH - PCE CONCENTRATIONS (WESTON SOLUTIONS, 2018)

>5,000 ug/m ^{3}
>10,000 ug/m ^{3}
>50,000 ug/m ^{3}

Proposed sewer line excavations

ATLAS

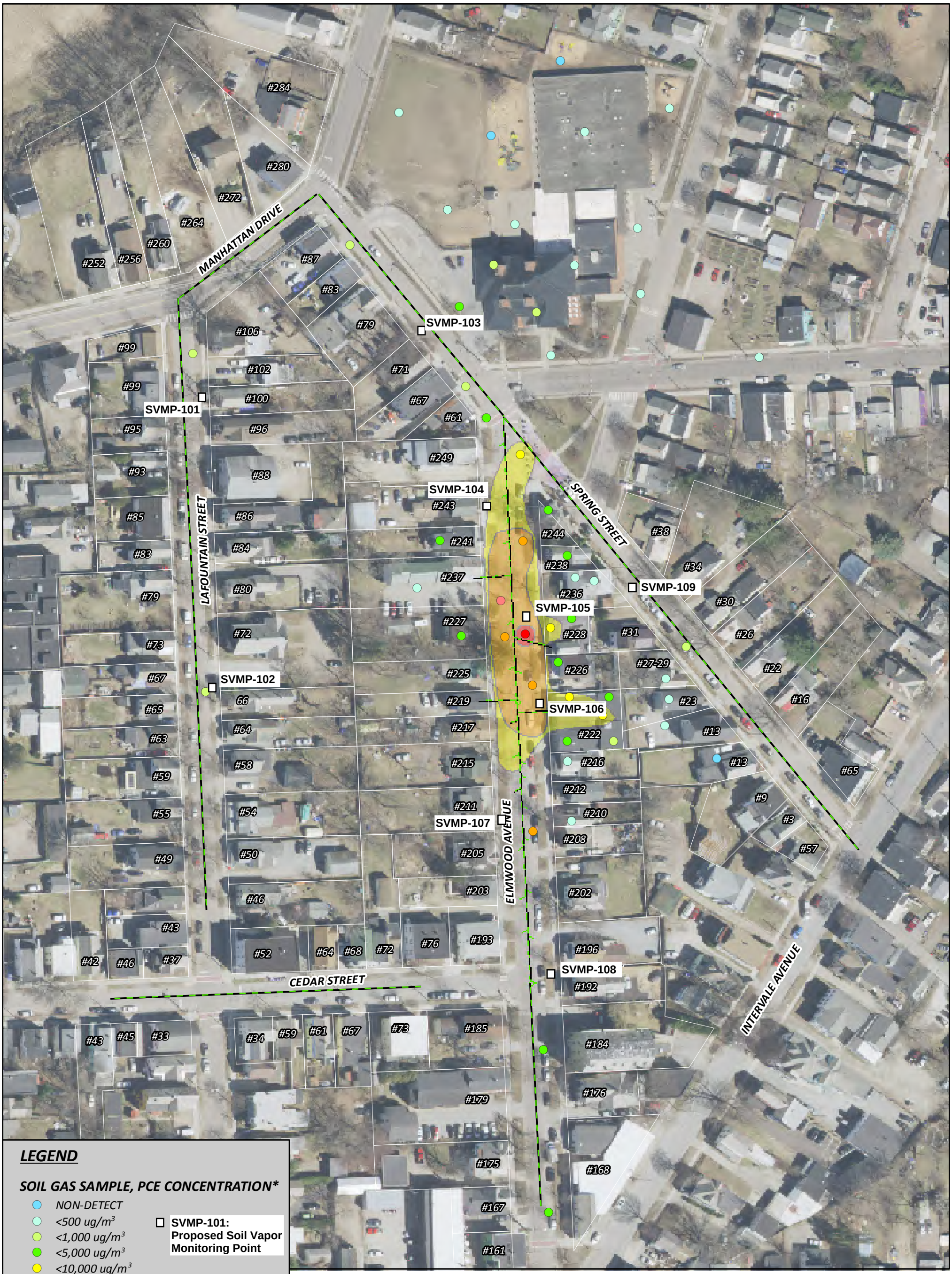
PROJECT:
ELMWOOD AVENUE INVESTIGATION
ELMWOOD AVENUE
BURLINGTON, VERMONT

TITLE:
SITE PLAN WITH GEOLOGIC CROSS SECTION

CLIENT:
VT DEC

COMPUTER CADFILE : ELMWOOD_AVE.dwg

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
S.M.S.		E.U.	E.U.
SCALE:	DATE:	JOB NO.:	FIGURE NO.:
1"=20'	12-18-20	28DEM00457	3



LEGEND

SOIL GAS SAMPLE, PCE CONCENTRATION*

- NON-DETECT
- <500 ug/m³
- <1,000 ug/m³
- <5,000 ug/m³
- <10,000 ug/m³
- <25,000 ug/m³
- <50,000 ug/m³
- >50,000 ug/m³

SVMP-101: Proposed Soil Vapor Monitoring Point

ISOPLETH - PCE CONCENTRATIONS*

- >50,000 ug/m³
- >10,000 ug/m³
- >5,000 ug/m³

* SOURCE: WESTON SOLUTIONS (AUGUST 2018)

PROPERTY BOUNDARIES

SEWER LINE

ELMWOOD AVENUE INVESTIGATION

ELMWOOD AVENUE, BURLINGTON, VERMONT

Figure 4: Proposed Soil Vapor Point Locations

0 50 100 200 300 Feet

N W E S

Map Generated: 2-17-21

ATLAS

APPENDIX A

HISTORIC SOIL AND SOIL VAPOR TABLES AND FIGURES

Table 1
Soil and Pipe Quality Results
Elmwood Avenue, Burlington, VT

Boring ID/Sample Location	Sample Depth (ft)	Sample Date	Lab Method	PID (ppmv)	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl chloride	FOC (%)
PS-L	11	11/11/20	8260	1,271	**41,500**	**1,100**	ND<971	ND<971	*ND<1,940*	NA
PS-D2	11	11/11/20	8260	103	ND<100	ND<100	ND<100	ND<100	*ND<200*	NA
PS-H	11	11/11/20	8260	0.0	ND<94.0	ND<94.0	ND<94.0	ND<94.0	*ND<188*	NA
PS-D4	11	11/11/20	8260	2,392	**768,000**	**10,700**	ND<1,120	ND<1,120	*ND<2,230*	NA
			Dup		**191,000**	**2,900**	**134**	ND<100	*ND<200*	
			RPD		*120%*	*115%*	--	--	--	
PS-D6	11	11/11/20	8260	653	**8,030**	ND<442	ND<442	ND<442	ND<884	NA
PS-D7	11	11/10/20	8260	1,117	**100,300**	**928**	ND<101	ND<101	*ND<202*	NA
PS-D9	11	11/10/20	8260	85.3	**14,400**	**990**	**146**	ND<99.0	*ND<198*	NA
PS-D11	11	11/10/20	8260	830	**51,400**	**1,370**	ND<973	ND<973	ND<1,950	NA
SS-D3	11	11/11/20	8260	0.2	**5.0**	ND<1.1	ND<1.1	ND<1.1	ND<2.2	NA
SS-D4	11	11/11/20	8260	0.2	**8.0**	ND<1.5	ND<1.5	ND<1.5	ND<3.0	NA
SS-D5	11	11/11/20	8260	0.2	**9.5**	ND<1.4	ND<1.4	ND<1.4	ND<2.8	NA
SS-D6	11	11/11/20	8260	0.2	**12.6**	ND<1.1	ND<1.1	ND<1.1	ND<2.2	NA
			Dup		**7.4**	ND<1.1	ND<1.1	ND<1.1	ND<2.2	
			RPD		*52%*	--	--	--	--	
SS-D7	11	11/10/20	8260	0.6	**7.9**	ND<1.0	ND<1.0	ND<1.0	ND<2.0	NA
SS-D8	11	11/10/20	8260	0.1	**4.9**	ND<1.3	ND<1.3	ND<1.3	ND<2.6	NA
SS-D10	11	11/10/20	8260	0.1	**52.9**	**2.6**	ND<1.4	ND<1.4	ND<2.8	NA
ATC-1	2-2.5	12/9/19	Hapsite	0.4	**25**	ND<2	NA	NA	NA	NA
	5-5.5	12/9/19	Hapsite	0.1	**5**	ND<2	NA	NA	NA	NA
	9.5-10	12/9/19	Hapsite	0.2	ND<2	ND<2	NA	NA	NA	NA
	10-11	12/9/19	Hapsite	0.2	ND<2	ND<2	NA	NA	NA	NA
ATC-2	2-3	12/9/19	Hapsite	0.5	**3**	ND<2	NA	NA	NA	NA
	5-6	12/9/19	Hapsite	0.3	**2**	ND<2	NA	NA	NA	NA
	10-10.5	12/9/19	Hapsite	0.1	ND<2	ND<2	NA	NA	NA	NA
	11	12/9/19	Hapsite	0.4	**3**	ND<2	NA	NA	NA	NA
	13-14	12/12/19	Hapsite	0.0	**2.84**	ND<2	NA	NA	NA	NA
	15-16	12/12/19	Hapsite	0.0	--	--	NA	NA	NA	**1.29**
	17-18	12/12/19	Hapsite	0.1	**2**	ND<2	NA	NA	NA	NA
	24-24.5	12/12/19	Hapsite	0.0	ND<2	ND<2	NA	NA	NA	NA
	25-26	12/12/19	Hapsite	0.0	--	--	NA	NA	NA	**0.451**
	31-32	12/12/19	Hapsite	0.0	ND<2	ND<2	NA	NA	NA	NA
ATC-3	2-3	12/9/19	Hapsite	1.3	**69**	ND<2	NA	NA	NA	NA
			8260	--	**75.6**	**3.6**	NA	NA	NA	NA
	RPD		--	--	*9%*	--	NA	NA	NA	NA
	5-6	12/9/19	Hapsite	1.0	**59**	ND<2	NA	NA	NA	NA
	9-9.5	12/9/19	Hapsite	0.2	**20**	ND<2	NA	NA	NA	NA
	10-11	12/9/19	Hapsite	0.1	**11**	ND<2	NA	NA	NA	NA
	13-13.5	12/12/19	Hapsite	0.2	ND<2	ND<2	NA	NA	NA	NA
	17-18	12/12/19	Hapsite	36.4	ND<2	ND<2	NA	NA	NA	NA
			8260	--	**1.4**	ND<0.96	NA	NA	NA	NA
	RPD		--	--	--	--	NA	NA	NA	NA
	27-28	12/12/19	Hapsite	0.1	ND<2	ND<2	NA	NA	NA	**0.381**
	31-31.5	12/12/19	Hapsite	0.1	ND<2	ND<2	NA	NA	NA	**0.617**
ATC-4	2-3	12/9/19	Hapsite	0.7	**17**	ND<2	NA	NA	NA	NA
	4-5	12/9/19	Hapsite	0.7	**43**	ND<2	NA	NA	NA	NA
	12-12.5	12/9/19	Hapsite	0.6	**8**	ND<2	NA	NA	NA	NA
			8260	--	**13.2**	ND<0.83	NA	NA	NA	NA
	RPD		--	--	*49%*	--	NA	NA	NA	NA
	14-15	12/12/19	Hapsite	0.0	**4.24**	ND<2	NA	NA	NA	**0.454**
	17.5	12/12/19	Hapsite	0.0	ND<2	ND<2	NA	NA	NA	NA
	20-21	12/12/19	Hapsite	0.0	ND<2	ND<2	NA	NA	NA	NA
			8260	--	**1.1**	ND<0.86	NA	NA	NA	NA
	RPD		--	--	--	--	NA	NA	NA	NA
	32.5-33	12/12/19	Hapsite	0.0	**2.35**	ND<2	NA	NA	NA	NA
				VSS Resident	**2,400**	**680**	**140,000**	**1,402,000**	**100**	**--**
				VSS Non-Resident	**14,000**	**6,500**	**1,814,000**	**18,137,000**	**590**	**--**

NOTES:
Volatile organic compound (VOC) soil quality results, provided in ug/kg = micrograms per kilogram, except FOC (see below)
PS = pipe sample (vitrified clay or VC sewer pipe)
PID = photoionization detector (10.6 eV lamp); ppmv = parts per million volume
ND = Not detected at or above stated method detection limit (MDL)
VSS = Vermont Soil Standards for Resident and Non-Resident Soils per IRULE Appendix A
Bold = detections above the laboratory reporting limit (RL)
Light shaded exceeds VSS Resident and dark shaded exceeds VSS Non-Resident
Italicized values indicate RL exceeds VSS
FOC = fraction of organic content, results provided in %
8260 = Offsite laboratory anaysis by EPA Method 8260 (2019 samples - SGS Accutest, 2020 samples Endyne, Inc.)
NA = not applicable or not analyzed
RPD = relative percent difference

Table 2:
Pipe Contaminant Mass Estimates
Elmwood Avenue Right of Way
Burlington, VT

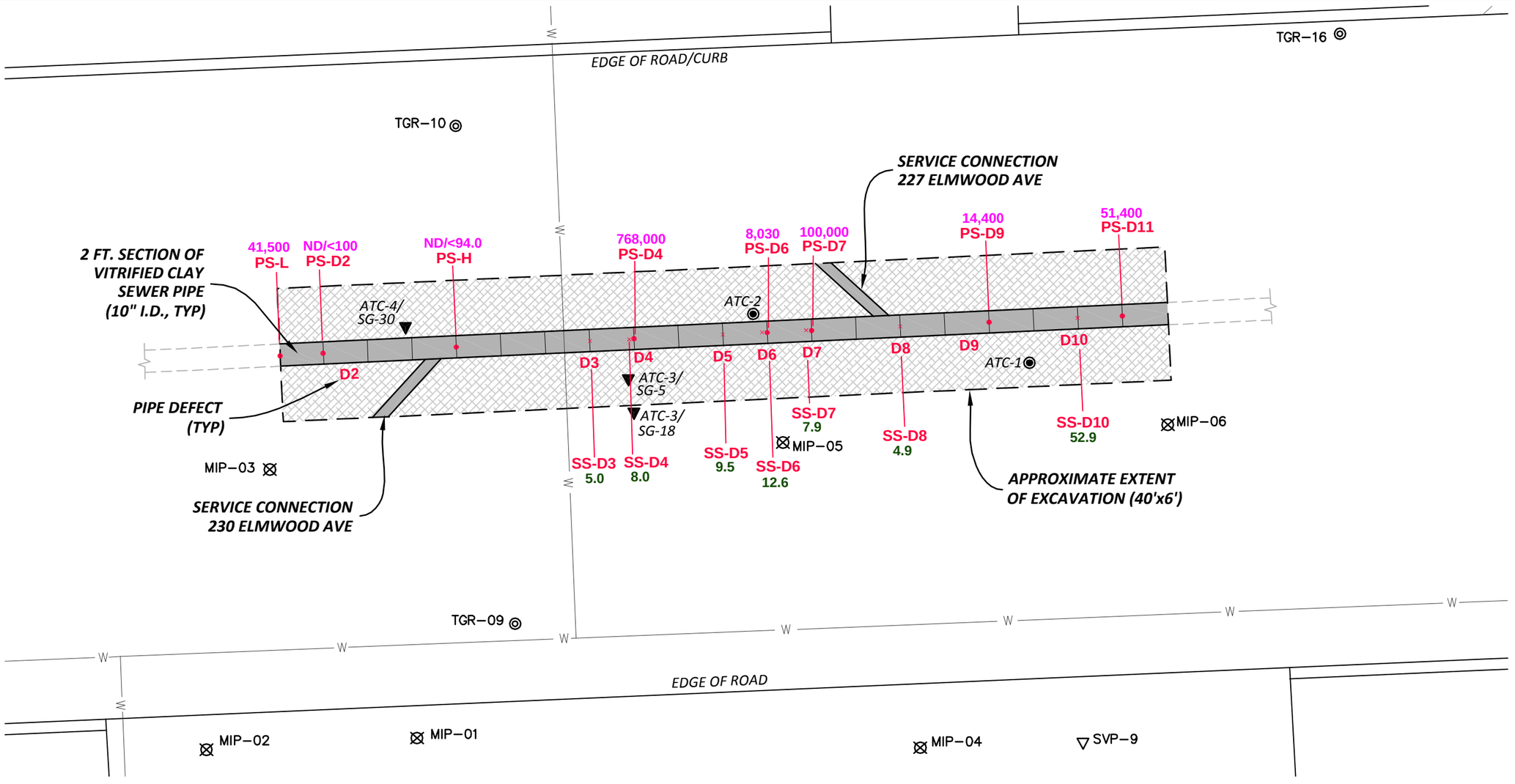
Parameter	Units	Result
Pipe Length	ft	40
Pipe Inside Diameter (ID)	in	10
Pipe Outside Diameter (OD)	in	12
Pipe Volume (OD-ID)	CF	9.6
Pipe Volume (corrected for bottom 1/4 of pipe)	CF	2.4
Assumed Porosity	unitless	0.50
Assumed Density	lbs/CF	110
Pipe Mass	lbs	132
	kg	60
Average PCE Concentration	mg/kg	123
PCE Mass	mg	7,363
	kg	0.007
	lbs	0.016
	lbs/gal	13.5
	gal	**0.219**
	gpf	0.005
Average TCE Concentration	mg/kg	1.97
TCE Mass	mg	117.67
	kg	0.0001
	lbs	0.0003
	lbs/gal	12.2
	gal	**0.003**
	gpf	0.0001

NOTES:
CF = cubic feet, CY = cubic yards
lbs = pounds, kg = kilograms, mg/kg = miligrams per kilogram
gpf = gallons per foot
PCE = perchloroethene or tetrachloroethene
TCE = trichloroethene
Density values derived from NIOSH Pocket Guide to Chemical Hazards

Table 3
Soil Screening Results
Elmwood Avenue, Burlington, VT

Sample ID	Sample Depth (fbgs)	Visual	Olfactory	PID (ppmv)
SS-1	3	Brown sand	None	0.1
SS-2	7	Brown sand	None	0.0
SS-3	11-12	Brown sand	None	0.2
SS-4	11-12	Brown sand	None	0.9
SS-5	11-12	Brown sand	None	0.1
SS-6	11-12	Brown sand	None	0.1
SS-7	11-12	Brown sand	None	0.2
SS-8	11-12	Brown sand	None	0.2
SS-9	11-12	Brown sand	None	0.7
SS-10	11-12	Brown sand	None	0.4
SS-11	11-12	Brown sand	None	0.1
SS-12	11-12	Brown sand	None	0.1
SS-13	11-12	Brown sand	None	1.1
SS-14	11-12	Brown sand	None	0.0
SS-15	11-12	Brown sand	None	0.0
SS-16	11-12	Brown sand	None	0.0

NOTES:
All data was collected on 11/10/20 and 11/11/20
PID = photoionization detector (10.6 eV lamp)
ppmv = parts per million volume
fbgs = feet below ground surface



LEGEND

W	WATER LINE
◎	SOIL VAPOR POINTS (WESTON SOLUTIONS, 2018)
▽	SOIL VAPOR POINTS (THE JOHNSON COMPANY, 2018)
⊠	MEMBRANE INTERFACE PROBE (VHB, 2019)
◉	SOIL BORING (ATC, DECEMBER 2019)
▼	SOIL VAPOR POINT (ATC, DECEMBER 2019)
× SS	EXCAVATION SOIL SAMPLE (ATC, NOVEMBER 2020)
• PS	SEWER PIPE SAMPLE (ATC, NOVEMBER 2020)
41,500	PCE IN PIPE MEDIA (ug/kg) (NOVEMBER 10 & 11, 2020)
7.9	PCE IN SOIL (ug/kg) (NOVEMBER 10 & 11, 2020)

N

5 0 2.5 5

(IN FEET)

1 inch = 5 ft.

ATC
—AN ATLAS COMPANY—
51 Knight Lane, PO Box 1486, Williston, VT 05495
Phone: 802-862-1900 www.atcgroupservices.com

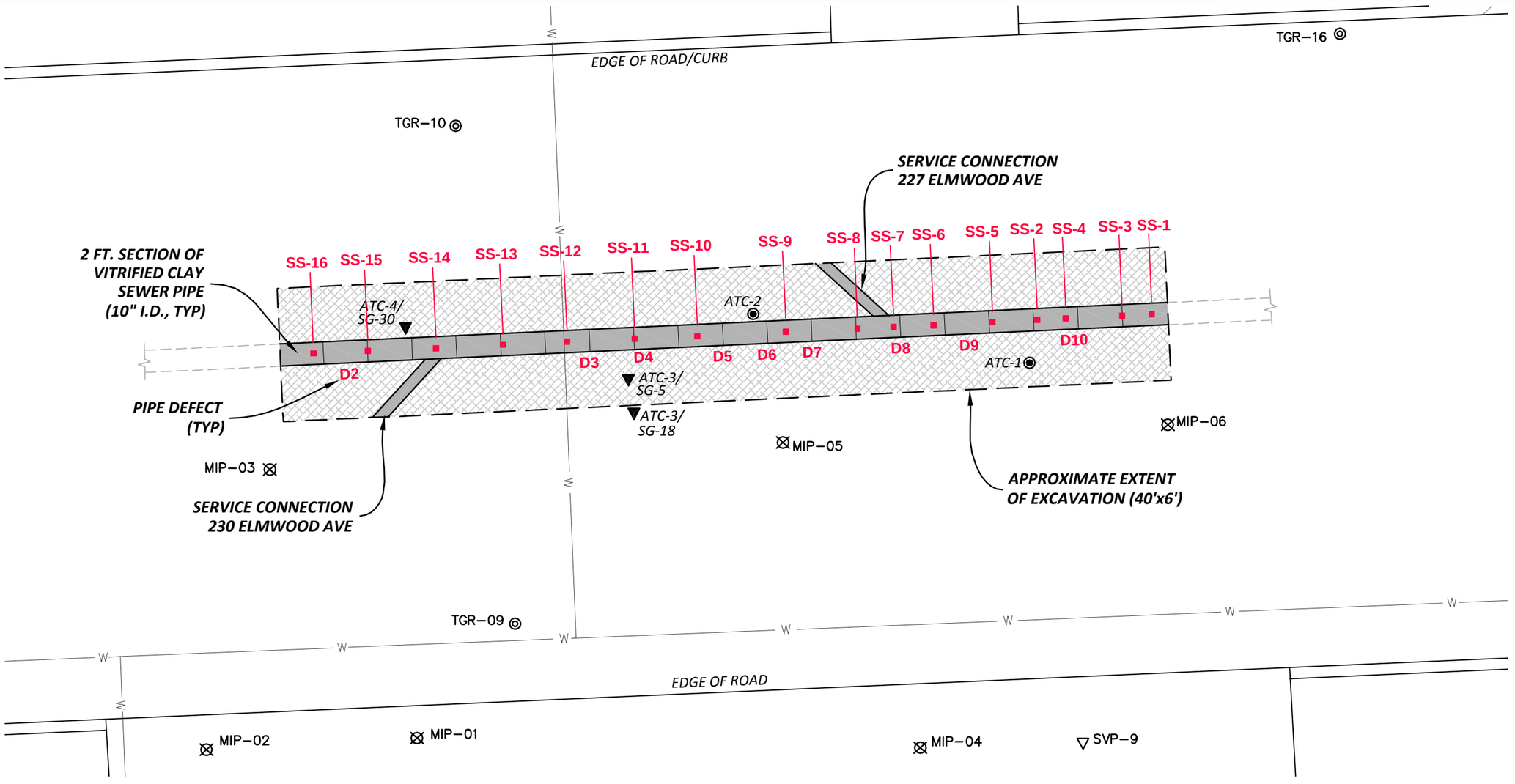
PROJECT:
ELMWOOD AVENUE INVESTIGATION
ELMWOOD AVENUE
BURLINGTON, VERMONT

TITLE:
PIPE & SOIL SAMPLING PLAN

CLIENT:
VT DEC

COMPUTER CADFILE : ELMWOOD_AVE.dwg

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
S.M.S.	E.U.	E.U.	J.H.
SCALE:	**DATE:**	**JOB NO.:**	**FIGURE NO.:**
NOTED	12–18–20	280EM00457	



LEGEND

- WATER LINE
- SOIL VAPOR POINTS (WESTON SOLUTIONS, 2018)
- SOIL VAPOR POINTS (THE JOHNSON COMPANY, 2018)
- MEMBRANE INTERFACE PROBE (VHB, 2019)
- SOIL BORING (ATC, DECEMBER 2019)
- SOIL VAPOR POINT (ATC, DECEMBER 2019)
- SS EXCAVATION SOIL SAMPLE (ATC, NOVEMBER 2020)

N

5 0 2.5 5

(IN FEET)

1 inch = 5 ft.

ATC
—AN ATLAS COMPANY—
51 Knight Lane, PO Box 1486, Williston, VT 05495
Phone: 802-862-1900 www.atcgroupservices.com

PROJECT:
ELMWOOD AVENUE INVESTIGATION
ELMWOOD AVENUE
BURLINGTON, VERMONT

TITLE:
SOIL SCREENING LOCATIONS

CLIENT:
VT DEC

COMPUTER CADFILE : ELMWOOD AVE.dwg

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
S.M.S.	E.U.	E.U.	J.H.
SCALE:	DATE:	JOB NO.:	FIGURE NO.:
NOTED	12–18–20	280EM00457	

APPENDIX B

PUBLIC NOTICE FORM

VERMONT

State of Vermont
Department of Environmental Conservation
Waste Management & Prevention Division
Davis Building - 1st Floor, One National Life Drive
Montpelier, VT 05620-3704

OFFICIAL NOTICE

Dear _____,

This is an official notice that a draft Corrective Action Plan (CAP) has been prepared by Atlas Technical Consultants on behalf of Vermont Department of Environmental Conservation for the Elmwood Avenue Right of Way site. Vermont law requires that adjoining and/or impacted property owners receive notice of this CAP, as well as being provided a 30 day public comment period.

The CAP approval process includes a public comment period and an opportunity to request a public meeting. Note that in order to appeal a final CAP approval, comments must be submitted during the public comment period.

To view the draft CAP, please visit the Environmental Notice Bulletin (ENB) at ENB.VERMONT.GOV, and enter the site number: 2017-4734 in the "Permit #" space. Do not include spaces or dashes.

For further information, please visit the following website:
DEC.VERMONT.GOV/PERMITS/ENB/GENERAL.

FOR QUESTIONS CONTACT:
Waste Management & Prevention Division, Sites Management Section (SMS)
SMS Site Manager: Kim Caldwell
SMS Site Manager email address: Kimberly.Caldwell@vermont.gov
(802) 828-1138

SITE NUMBER

2017-4734

NAME OF POTENTIALLY RESPONSIBLE PARTY

Gadue's Dry Cleaning, Inc.

LOCATION OF CORRECTIVE ACTION STREET ADDRESS/ROUTE

222 Elmwood Avenue

TOWN(S) WHERE PROPOSED CORRECTIVE ACTION WILL TAKE PLACE

Burlington

ELMWOOD AVENUE - CORRECTIVE ACTION PLAN
PROPERTIES TO RECEIVE PUBLIC NOTICE

911 NUMBER	911 STREET	OWNER		MAILING ADDRESS		CITY	STATE	ZIP	TAX MAP	SPAN
6	ARCHIBALD ST	CITY SCHOOL DEPARTMENT	ADMISTRATIVE OFFICES/EED	150 COLCHESTER AV		BURLINGTON	VT	5401	039-4-089-000	114-035-13901
34	CEDAR ST	MONAHAN, JORDAN D.	MONAHAN, MICHELLE M.	116 VAN PATTEN PARKWAY		BURLINGTON	VT	5408	044-1-178-000	114-035-14636
37	CEDAR ST	FISHER, MARIA J		P O BOX 1801		BURLINGTON	VT	5402	044-1-187-000	114-035-14645
38	CEDAR ST	LINK, CHARLES C		P O BOX 1313		BURLINGTON	VT	5401	044-1-179-000	114-035-14637
39	CEDAR ST	BUSHEY, JOHN		C/O BISSONETTE PROPERTIES	100 NORTH STREET	BURLINGTON	VT	5401	044-1-186-000	114-035-14644
42	CEDAR ST	LINK, CHARLES C		P O BOX 1313		BURLINGTON	VT	5402	044-1-180-000	114-035-14638
43	CEDAR ST	MCGOWAN, J STUART	WATSON, JOAN H	107 INTERVALE AVE		BURLINGTON	VT	5401	044-1-185-000	114-035-14643
45	CEDAR ST	SPENCER, AUTUMN K. ENGROFF	SPENCER II, T. JEFFREY	139 NORTH WILLARD ST		BURLINGTON	VT	5401	044-1-184-000	114-035-14642
46	CEDAR ST	LAMA, LAKPA T.	SHERPA, DOMA	54 LINDEN TER		BURLINGTON	VT	5401	044-1-181-000	114-035-14639
52	CEDAR ST	52-62 CEDAR STREET LLC		PO BOX 395		WILLISTON	VT	5495	044-1-182-000	114-035-14640
59	CEDAR ST	HARRINGTON, GEORGE M	HARRINGTON, ANDREA G	PO BOX 3012		BURLINGTON	VT	5408	044-1-183-000	114-035-14641
61	CEDAR ST	BEATTY-OWENS, BENJAMIN R.	OWENS, PHILIPPA	182 PARK ST APT 1		BURLINGTON	VT	5401	044-3-011-000	114-035-15009
64	CEDAR ST	64-66 CEDAR STREET LLC		7997 WILLISTON ROAD		WILLISTON	VT	5495	044-3-012-000	114-035-15010
67	CEDAR ST	HARRINGTON, GEORGE M	HARRINGTON, ANDREA G	PO BOX 3012		BURLINGTON	VT	5408	044-3-010-000	114-035-15008
68	CEDAR ST	THAN, RICHARD		PO BOX 5184		BURLINGTON	VT	5402	044-3-013-000	114-035-15011
72	CEDAR ST	GRIMARD, LOIS		74 CEDAR ST		BURLINGTON	VT	5401	044-3-014-000	114-035-15012
73	CEDAR ST	HOWELL, CHRISTOPHER	ROSENBERG, CHASE	390 1/2 ST PAUL ST		BURLINGTON	VT	5401	044-3-009-000	114-035-15007
76	CEDAR ST	FISHER, MARIA J		PO BOX 1801		BURLINGTON	VT	5402	044-3-016-000	114-035-15013
161	ELMWOOD AV	COLE, JOHN	COLE, JOHN	24 SHORE ACRES DR		COLCHESTER	VT	5446	044-3-004-000	114-035-15002
167	ELMWOOD AV	LACHTRUPP, GREG	LACHTRUPP, EMILY	80 AUSTIN DR APT 246		BURLINGTON	VT	5401	044-3-005-000	114-035-15003
168	ELMWOOD AV	POKHREL, CHANDRA	POKHREL, MAYA	1 LAMOILLE ST		ESSEX JUNCTION	VT	5452	044-3-039-000	114-035-15035
175	ELMWOOD AV	ELY, DAVID A.	BARNES, MARY A.	175 ELMWOOD AVENUE		BURLINGTON	VT	5401	044-3-006-000	114-035-15004
176	ELMWOOD AV	SCHULZ, ERIC ALLAN		176 BUCKINGHAM DRIVE		COLCHESTER	VT	5446	044-3-038-000	114-035-15034
179	ELMWOOD AV	OFFENHARTZ, INC.		196 BATTERY ST		BURLINGTON	VT	5401	044-3-007-000	114-035-15005
184	ELMWOOD AV	COMMITTEE ON TEMP SHELTER		PO BOX 1616		BURLINGTON	VT	5402	044-3-037-000	114-035-15033
185	ELMWOOD AV	MCLEOD, LOU ANNE	LOU ANNE MCLEOD REVOCABLE TRUST	185 ELMWOOD AVE		Burlington	VT	5401	044-3-008-000	114-035-15006
192	ELMWOOD AV	FIVE SEASONS REAL ESTATE, LLC		19 MARBLE AVENUE		BURLINGTON	VT	5401	044-3-035-000	114-035-15032
193	ELMWOOD AV	THE BALL REVOCABLE TRUST		766 ONE MILE RD		CHARLOTTE	VT	5445	044-3-017-000	114-035-15014
196	ELMWOOD AV	SHORT, JASON T.	SHORT, TIFFANY D	196 ELMWOOD AVE		BURLINGTON	VT	5401	044-3-034-000	114-035-15031
202	ELMWOOD AV	LOCAL ROOTS PROPERTY MANAGEMEN		22 PINE TREE TER		SOUTH BURLINGTON	VT	5403	044-3-033-000	114-035-15030
203	ELMWOOD AV	HARRINGTON, KATHLEEN	HARRINGTON, KEVIN	203 ELMWOOD AVENUE		BURLINGTON	VT	5403	044-3-018-000	114-035-15015
205	ELMWOOD AV	CREHAN, RYAN	CREHAN, COLUMBIA	205 ELMWOOD AVE		BURLINGTON	VT	5401	044-3-019-000	114-035-15016
208	ELMWOOD AV	PLOOF, PHILIP J	PLOOF, DEBORAH F	208 ELMWOOD AVE 1		BURLINGTON	VT	5401	044-3-032-000	114-035-15029
210	ELMWOOD AV	KILGORE, NANCY H.	KILGORE, JESS B.	210 ELMWOOD AVE		BURLINGTON	VT	5401	044-3-031-000	114-035-15028
211	ELMWOOD AV	SANDERS, JULY E		211 ELMWOOD AV		BURLINGTON	VT	5401	044-3-020-000	114-035-15017
212	ELMWOOD AV	CHAMPLAIN HOUSING TRUST		88 KING STREET		BURLINGTON	VT	5401	044-3-030-000	114-035-20614
212	ELMWOOD AV	PRADHAN, LAL B.	PRADHAN, MUNA	212 ELMWOOD AVE		BURLINGTON	VT	5401	044-3-030-001	114-035-15027
215	ELMWOOD AV	BOUDREAU, MATTHEW		139 INTERVALE AVENUE, UNIT 1		BURLINGTON	VT	5401	044-3-021-000	114-035-15018
216	ELMWOOD AV	C MCLAURIN & SON PROPS LLC		11425 CALLAHAN MILL DR		CHARLOTTE	NC	28213	044-3-029-000	114-035-15026
217	ELMWOOD AV	PAOLUCCI, JAMES		217 ELMWOOD AVENUE		BURLINGTON	VT	5401	044-3-022-000	114-035-15019
219	ELMWOOD AV	LEBEAU, WILLIAM J	LEBEAU, PENNY A	219 ELMWOOD AVENUE		BURLINGTON	VT	5401	044-3-023-000	114-035-15020
222	ELMWOOD AV	GADUE, A MARK		63 CREEK FARM ROAD		COLCHESTER	VT	5446	044-3-028-000	114-035-15025
225	ELMWOOD AV	ADHIKARI, GANESH	ADHIKARI, INDRA	225 ELMWOOD AVENUE		BURLINGTON	VT	5401	044-3-024-000	114-035-15021
226	ELMWOOD AV	EAGAN, KATHLEEN		226 ELMWOOD AVENUE		BURLINGTON	VT	5401	044-3-027-000	114-035-15024
227	ELMWOOD AV	REISSIG, KENNETH D	BERTHIAUME, JEAN R	2502 NORTH RD		WAITSFIELD	VT	5673	044-3-025-000	114-035-15022
228	ELMWOOD AV	COLLIER, MICHAEL		228 ELMWOOD AVENUE		BURLINGTON	VT	5401	044-3-026-000	114-035-15023
236	ELMWOOD AV	DOORSTOP, LLC		292 MEAD FARM RD		HINESBURG	VT	5461	039-4-260-000	114-035-14034
237	ELMWOOD AV	237 ELMWOOD LLC		PO BOX 23, UNIT 9A		BURLINGTON	VT	5402	039-4-055-000	114-035-13869
238	ELMWOOD AV	LINDSTROM, ERIC		238 ELMWOOD AVE		BURLINGTON	VT	5401	039-4-053-000	114-035-13868
241	ELMWOOD AV	KIRK, DANIEL		241 ELMWOOD AVENUE		BURLINGTON	VT	5401	039-4-056-000	114-035-13870
243	ELMWOOD AV	THAN, RICHARD		243 ELMWOOD AVE		BURLINGTON	VT	5401	039-4-057-000	114-035-13871
244	ELMWOOD AV	STEPHEN M.J. CAREY TRUST	CAREY, STEPHEN M.J.	PO BOX 5393		BURLINGTON	VT	5402	039-4-052-000	114-035-13867
249	ELMWOOD AV	BOURNE, RENE P	BOURNE, SHARON	116 LAKEVIEW DRIVE		WILLISTON	VT	5495	039-4-060-000	114-035-13872
37	LAFOUNTAIN ST	KIRK, DANIEL		241 ELMWOOD AVENU, UNIT 1		BURLINGTON	VT	5401	044-1-208-000	114-035-14665
43	LAFOUNTAIN ST	HOLWAY, KERRY T	HOLWAY, JAMES E	63 LOALDO DRIVE		BURLINGTON	VT	5408	044-1-209-000	114-035-14666
45	LAFOUNTAIN ST	DAY, LESLIE		45 LAFOUNTAIN STREET		BURLINGTON	VT	5401	044-1-210-000	114-035-14667
46	LAFOUNTAIN ST	MILLER, MICHAEL	MILLER, JANE	558 WEST CHESTNUT ST		LANCASTER	PA	17603	044-1-226-000	114-035-14682
47	LAFOUNTAIN ST	VOLPE, JARED W	CONNER, CAROLYN E	1518 HEARST AVENUE		BERKELEY	CA	94703	044-1-239-001	114-035-52246
49	LAFOUNTAIN ST	DONFORTH, LUKE A.	DONFORTH, SOPHIA K.	49 LAFOUNTAIN ST		BURLINGTON	VT	5401	044-1-239-002	114-035-52247
50	LAFOUNTAIN ST	BPJS MANAGEMENT LLC		C/O BISSONETTE PROPERTIES	100 NORTH STREET	BURLINGTON	VT	5401	044-1-225-000	114-035-14681
54	LAFOUNTAIN ST	MATOT, DAVID	MATOT, DIANA	383 CROSSFIELD DR		COLCHESTER	VT	5446	044-1-224-000	114-035-14680
55	LAFOUNTAIN ST	BOSKA, HAYDEN J	PARRISH, NICHOLAS E	3837 36TH AVENUE SOUTHWEST		SEATLE	WA	98126	044-1-212-000	114-035-14668
58	LAFOUNTAIN ST	DUMONT REALTY LLC		30 O BRIEN DR		SOUTH BURLINGTON	VT	5403	044-1-223-000	114-035-14679
59	LAFOUNTAIN ST	FLANIGAN, JACOB		59 LAFOUNTAIN ST		BURLINGTON	VT	5401	044-1-213-000	114-035-14669
63	LAFOUNTAIN ST	MOROZ, ANDREW	RAATIKANINEN, LISA	63 LAFOUNTAIN ST		BURLINGTON	VT	5401	044-1-214-000	114-035-14670
64	LAFOUNTAIN ST	LAVALLEY, RENEE D		64 LAFOUNTAIN STREET		BURLINGTON	VT	5401	044-1-222-000	114-035-14678
65	LAFOUNTAIN ST	WILLIAMS, SARAH H		65 LAFOUNTAIN STREET		BURLINGTON	VT	5401	044-1-215-000	114-035-14671
66	LAFOUNTAIN ST	SMYRSKI, JOHN M	WIELER, MARY K	39 DUNSINANE DRIVE		LEBANON	NH	3766	044-1-221-000	114-035-14677

ELMWOOD AVENUE - CORRECTIVE ACTION PLAN
PROPERTIES TO RECEIVE PUBLIC NOTICE

911 NUMBER	911 STREET	OWNER		MAILING ADDRESS		CITY	STATE	ZIP	TAX MAP	SPAN
67	LAFOUNTAIN ST	NICHOLS, JOANN		67 LAFOUNTAIN STREET		BURLINGTON	VT	5401	044-1-216-000	114-035-14672
72	LAFOUNTAIN ST	72-78 LAFOUNTAIN LLC		C/O REDSTONE	PO BOX 790	BURLINGTON	VT	5402	044-1-220-000	114-035-14676
73	LAFOUNTAIN ST	KHANG-GHONGMA, TENZIN N		166 KILLARNEY DRIVE		BURLINGTON	VT	5408	044-1-217-000	114-035-14673
79	LAFOUNTAIN ST	GIBSON, PARISH J.	VALADE, KATIE ELIZABETH	42 1/2 HAYWARD STREET		BURLINGTON	VT	5401	044-1-218-000	114-035-14674
80	LAFOUNTAIN ST	NAPOLITANO, DANTE	NAPOLITANO, CHRISTINE	64 PLEASANT AV		BURLINGTON	VT	5408	044-1-219-000	114-035-14675
83	LAFOUNTAIN ST	CHAMPLAIN HOUSING TRUST INC		88 KING ST		BURLINGTON	VT	5401	039-2-012-000	114-035-20621
83	LAFOUNTAIN ST	CHAMPLAIN HOUSING TRUST, INC.		88 KING STREET		BURLINGTON	VT	5401	039-2-012-001	114-035-13762
84	LAFOUNTAIN ST	MCDONNELL, NINA R	BAKER, JASON A	84 LAFOUNTAIN STREET		BURLINGTON	VT	5401	039-2-010-000	114-035-13761
85	LAFOUNTAIN ST	SEILER, JASON F S	WARWICK, CYNTHIA A	134 PLEASANT AVENUE		BURLINGTON	VT	5408	039-2-013-000	114-035-13763
86	LAFOUNTAIN ST	LAFAYETTE III, DAVID T	LAFAYETTE, HEATHER M	5 CRANWELL AVE		SOUTH BURLINGTON	VT	5403	039-2-008-000	114-035-13760
88	LAFOUNTAIN ST	SWB, LLC		100 NORTH STREET		BURLINGTON	VT	5401	039-2-007-000	114-035-13759
93	LAFOUNTAIN ST	CHAMPLAIN HOUSING TRUST		88 KING STREET		BURLINGTON	VT	5401	039-2-014-000	114-035-20641
93	LAFOUNTAIN ST	LARSON, LAURIE		93 LAFOUNTAIN STREET		BURLINGTON	VT	5401	039-2-014-001	114-035-13764
95	LAFOUNTAIN ST	FISKE, KIM	FISKE, DANIELLE	95 LAFOUNTAIN ST		BURLINGTON	VT	5401	039-2-015-000	114-035-13765
96	LAFOUNTAIN ST	DOLMA, TENZING		96 LAFOUNTAIN STREET, UNIT A		BURLINGTON	VT	5401	039-2-006-000	114-035-13758
99	LAFOUNTAIN ST	SCHERR, DAVID A.		99-101 LAFOUNTAIN ST		BURLINGTON	VT	5401	039-2-016-000	114-035-13766
100	LAFOUNTAIN ST	CHAMPLAIN HOUSING TRUST		88 KING STREET		BURLINGTON	VT	5401	039-2-005-000	114-035-20607
100	LAFOUNTAIN ST	LEDDY, JOHN I	TILLMAN, TIFFANY D	100 LAFOUNTAIN STREET		BURLINGTON	VT	5401	039-2-005-001	114-035-13757
102	LAFOUNTAIN ST	PEARL, MITCHELL L.	PEARL, MAUREEN G	25 EAST PROSPECT		BRANDON	VT	5733	039-2-004-000	114-035-13756
105	LAFOUNTAIN ST	FUTTY, ALEXANDRA	FUTTY, CHRISTOPHER	105 LAFOUNTAIN ST		BURLINGTON	VT	5401	039-2-017-000	114-035-13767
106	LAFOUNTAIN ST	LEW, SKY		365 WESTERN AVENUE	# 3	CAMBRIDGE	MA	2139	039-2-003-000	114-035-13755
252	MANHATTAN DR	NOONAN, DANIEL A.		252-254 MANHATTAN DR		BURLINGTON	VT	5401	039-2-056-000	114-035-13812
256	MANHATTAN DR	CHAMPLAIN HOUSING TRUST		88 KING ST		BURLINGTON	VT	5401	039-2-057-000	114-035-20642
256	MANHATTAN DR	DUBO, MIRSAD	DUBO, OLGA	256 258 MANHATTAN DR		BURLINGTON	VT	5401	039-2-057-001	114-035-13813
260	MANHATTAN DR	PBGC, LLC		100 NORTH ST		BURLINGTON	VT	5401	039-2-058-000	114-035-13814
264	MANHATTAN DR	PBGC, LLC		100 NORTH ST		BURLINGTON	VT	5401	039-2-059-000	114-035-13815
272	MANHATTAN DR	PBGS, LLC		100 NORTH ST		BURLINGTON	VT	5401	039-2-063-000	114-035-13818
280	MANHATTAN DR	280 MANHATTAN LLC		280 MANATTAN DRIVE		BURLINGTON	VT	5401	039-2-060-000	114-035-13816
3	SPRING ST	ROSENBERG, CHASE C		3 SPRING ST		BURLINGTON	VT	5401	044-3-049-000	114-035-15043
9	SPRING ST	THIBAULT, DANIEL J	THIBAULT, LUKE J	915 MACRAE ROAD		COLCHESTER	VT	5446	044-3-050-000	114-035-15044
13	SPRING ST	CUSHING, JAMES		13 SPRING STREET		BURLINGTON	VT	5401	044-3-051-000	114-035-15045
16	SPRING ST	BISSONETTE, SHANE		C/O BISSONETTE PROPERTIES	100 NORTH STREET	BURLINGTON	VT	5401	044-3-061-000	114-035-15053
19	SPRING ST	CHOPHEL, DORJEE	DOLMA, TENZIN	7 BARRETT ST		SOUTH BURLINGTON	VT	5403	044-3-052-000	114-035-15046
22	SPRING ST	ABBATICCHIO, JAMIE		22 SPRING ST APT 1		BURLINGTON	VT	5401	044-3-060-000	114-035-15052
23	SPRING ST	YESHI, TSERING	CHOPHEL, DORJEE	7 BARRETT ST		SOUTH BURLINGTON	VT	5403	044-3-053-000	114-035-15047
26	SPRING ST	DOYLE, REED	FRANK, JANE	26 SPRING ST		BURLINGTON	VT	5401	044-3-059-000	114-035-15051
27	SPRING ST	KROWINSKI, JILL		27 SPRING ST		BURLINGTON	VT	5401	044-3-054-001	114-035-20696
29	SPRING ST	KIMBALL, MELINDA		29 SPRING ST		BURLINGTON	VT	5401	044-3-054-002	114-035-20697
30	SPRING ST	BENNION, JANET		30 SPRING ST		BURLINGTON	VT	5401	044-3-058-000	114-035-15050
31	SPRING ST	FARBISZ, TIMOTHY		31 SPRING STREET		BURLINGTON	VT	5401	044-3-055-000	114-035-15049
34	SPRING ST	VALIN, CHRISTOPHER		34 SPRING ST		BURLINGTON	VT	5401	039-4-050-000	114-035-13865
38	SPRING ST	WOLFE, JEAN		38 SPRING STREET		BURLINGTON	VT	5401	039-4-049-000	114-035-13864
50	SPRING ST	CITY DPW PARKS REC DEPT		645 PINE ST		BURLINGTON	VT	5401	039-4-051-000	114-035-13866
61	SPRING ST	WALKER, ADAM B	JOLLY, RACHEL I	44 STRONG ST		BURLINGTON	VT	5401	039-4-061-000	114-035-13873
67	SPRING ST	BPJS MANAGEMENT LLC		C/O BISSONETTE PROPERTIES	100 NORTH STREET	BURLINGTON	VT	5401	039-4-062-000	114-035-13874
71	SPRING ST	KHAN, AHMED F.		295 BROWNS RIVER ROAD		ESSEX JUNCTION	VT	5452	039-4-063-000	114-035-13875
79	SPRING ST	BEARDEN, JANE RACHEL		26 LUCAS RD		RICHFORD	VT	5476	039-4-064-000	114-035-13876
83	SPRING ST	ROONEY, RICHARD	ROONEY, BEVERLY O FREE	7 LAKEWOOD PW		BURLINGTON	VT	5408	039-4-065-000	114-035-13877
87	SPRING ST	SWB LLC		C/O BISSONETTE PROPERTIES	100 NORTH STREET	BURLINGTON	VT	5401	039-4-066-000	114-035-13878

VERMONT

State of Vermont
Department of Environmental Conservation
Waste Management & Prevention Division
One National Life Drive - Davis 1
Montpelier, VT 05620-3704

AGENCY OF NATURAL RESOURCES

Elmwood Avenue Investigation Update

Background Information

In the summer of 2018, The Vermont Department of Environmental Conservation (VTDEC) and US Environmental Protection Agency (EPA) investigated chemicals found in soil gas (air in the spaces between soil particles) along Elmwood Ave in Burlington (see attached map). The chemicals are **tetrachloroethylene (PCE)** and **trichloroethylene (TCE)**, which are commonly used for dry cleaning and as degreasing solvents. These chemicals can move from the soil gas into the air of buildings through the foundation. The movement of these chemicals in soil gas from below ground into a nearby building is referred to as vapor intrusion. When these chemicals are breathed in, they can be harmful to your health. Several homes in the area were tested and found to have concentrations of PCE in indoor air above state standards. TCE was not detected in the indoor air of any homes, and no immediate health risks were identified.

Recent Work

Vapor mitigation systems have been installed in a few homes that had the highest levels of PCE in indoor air, prioritizing those that had exceedances in the first floor living spaces. This work includes the installation of vapor barriers and/or sub-slab depressurization systems, similar to a radon fan, to prevent soil gas from coming into the buildings. This work is in progress for other homes on Elmwood Ave and Spring Street.

VTDEC's contractor worked with the City to collect samples from a section of sewer line and the soil directly beneath the sewer line on Elmwood Ave. A 40ft section of sewer line was replaced as part of this work. The pieces of sewer pipe that were tested in a lab were shown to have high levels of PCE and TCE, due to the release of these chemicals to the sewer line many years ago. High levels of these chemicals have not been found in the surrounding soil, so the vapors in the area are coming from the sewer pipe, made of clay tile.

Next Steps

The removal and replacement of a longer section of sewer line on Elmwood Ave is planned, to reduce the concentrations of PCE and TCE in soil gas. A Corrective Action Plan for this sewer line replacement is now available for public review. It is expected that sewer line removal will happen in the Spring. More soil gas samples will be collected from Elmwood Ave and surrounding streets both before and after the sewer line is removed, to monitor the clean-up.

Detections of PCE in indoor air have been identified in the basements of a couple homes tested on LaFountain Street, so it is likely that other homes in the area may have similar results, if tested. The levels of PCE that have been observed are low and well within acceptable limits for commercial properties which assume an exposure duration up to 12 hours per day. As typical basement use is limited to storage or laundry, the risk of health effects from exposure to these levels of PCE for short amounts of time is low, so the immediate installation of mitigation systems in each home is not necessary at this time. Soil gas data collected after the sewer line removal will help us determine if any additional indoor air testing and mitigation is necessary in the area. ***If the indoor air of your home has not been tested and the basement of your building is used as a main living space such as an office or bedroom, you can contact us to see if indoor air testing should occur.***

Potential Health Impacts

The chemical PCE can produce a variety of health effects. Exposure to this chemical can increase a person's risk of getting cancer. The chemicals can affect the development of a baby if a woman is exposed to them

while pregnant. These chemicals can also affect the immune system and central nervous system. These effects vary with exposure duration and levels.

Questions about the investigation and future work can be directed to the Dept of Environmental Conservation:

Kimberly Caldwell, Environmental Analyst
802-461-5857
Kimberly.Caldwell@vermont.gov

Michael Nahmias, Environmental Analyst
802-522-4595
Michael.Nahmias@vermont.gov

Questions about the chemicals and their possible health effects can be directed to the Dept of Health:

Environmental Health Division
1-800-439-8550
www.healthvermont.gov/dry-cleaning-chemicals

Site Map showing the highest concentrations of PCE on Elmwood Ave (Modified from Weston Solutions)

APPENDIX C

HEALTH & SAFETY PLAN

Health and Safety Plan

Prepared For:

Vermont Department of Environmental Conservation

Site #2017-4734

Elmwood Avenue Right of Way

Burlington, Vermont 05401

Atlas Project #280EM00734

Prepared By:

Atlas Technical Consultants

51 Knight Lane

Williston, Vermont 05495

REVIEW AND APPROVAL

CLIENT: VTDEC **PROJECT NUMBER:** 280EM00734

SITE NAME: Elmwood Avenue ROW **SITE LOCATION:** Burlington, VT

PROJECT DESCRIPTION: **Excavation, sampling and replacement of 160 linear feet of 10" VCP sewer main to remove the suspected source of PCE/TCE contamination that is off-gassing from the sewer pipe and creating a soil vapor cloud in the neighborhood that is impacting several residential buildings via completed vapor intrusion pathways.**

PREPARED BY: Erik Urch **TITLE:** Senior Project Manager **DATE:** November 9, 2021

Erik Urch		
Project Manager	**Signature**	**Date**
Harland Miller		
Reviewer's Name	**Signature**	**Date**

This Health and Safety Plan (HASP) has been written for the use of Atlas and its employees. It may also be used as a guidance document by properly trained and experienced Atlas subcontractors. However, Atlas does not guarantee the health or safety of any person working on this project site.

Due to the potential hazardous nature of this site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards which may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury at this site. The health and safety guidelines in this Plan were prepared specifically for this site and should not be used on any other site without prior research by trained health and safety specialists. All site personnel have the authority to "Stop Work" if unsafe conditions are present or discovered during site activities.

Atlas claims no responsibility for use of this plan by others. The plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if these conditions change.

Table of Contents

EMERGENCY INFORMATION

Site Emergency Numbers	
Police, Fire and Ambulance Emergencies	**911**
CORE Health Networks *(24 hour Injury/Illness Case Management)*	**(855) 282-6331**
Poison Control Center	**(800) 222-1222**
Nationwide Call Before You Dig	**811**
National Response Center	**(800) 424-8802**
EPA Region #1 Main Office	**(808) 372-7341**
VTDEC	**(802) 828-1556**

HOSPITAL AND ROUTE INFORMATION

UVM Medical Center

111 Colchester Ave, Burlington, VT 05401

SEE ATTACHED GOOGLE MAPS BELOW

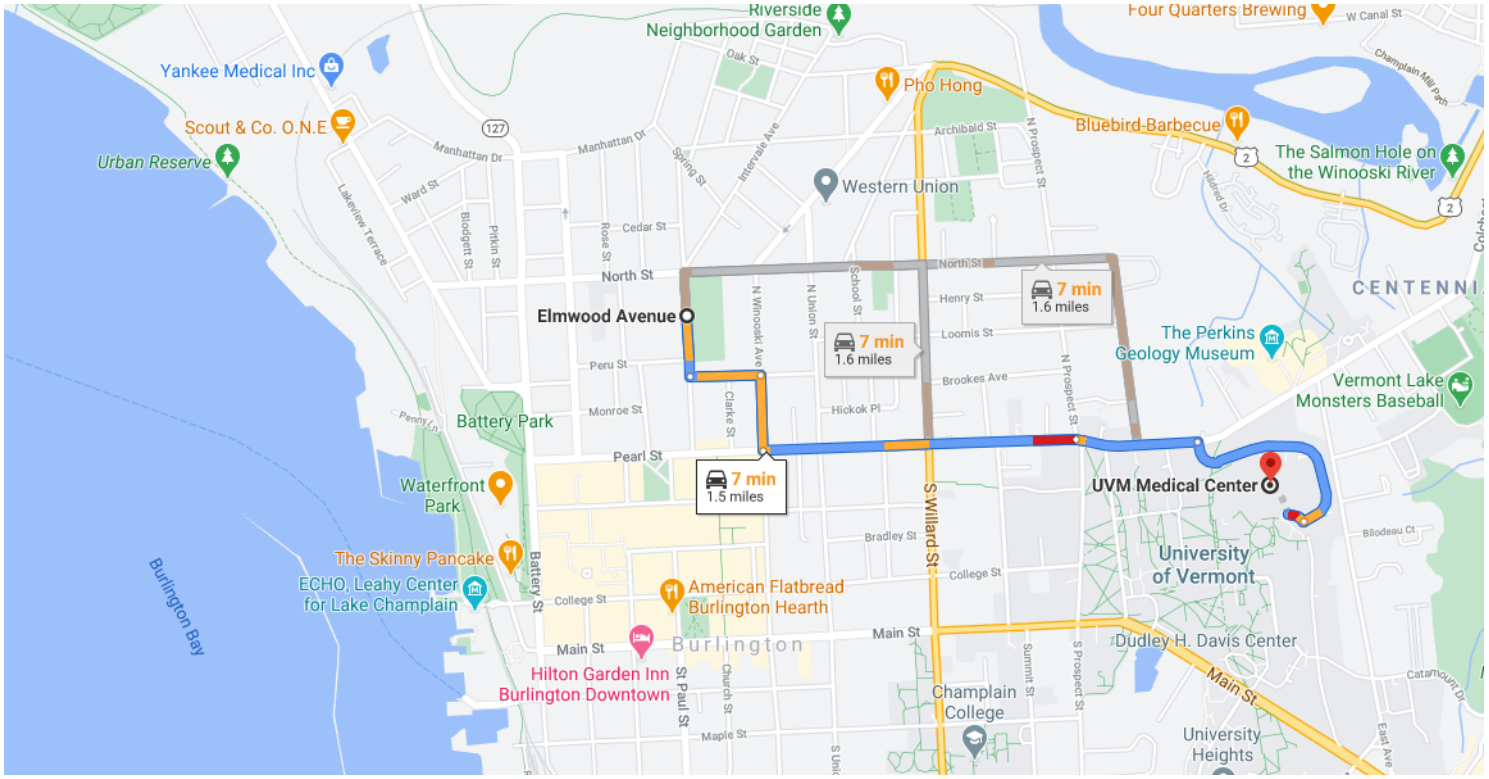
OCCUPATIONAL MEDICAL CLINIC AND ROUTE INFORMATION

Concentra Urgent Care

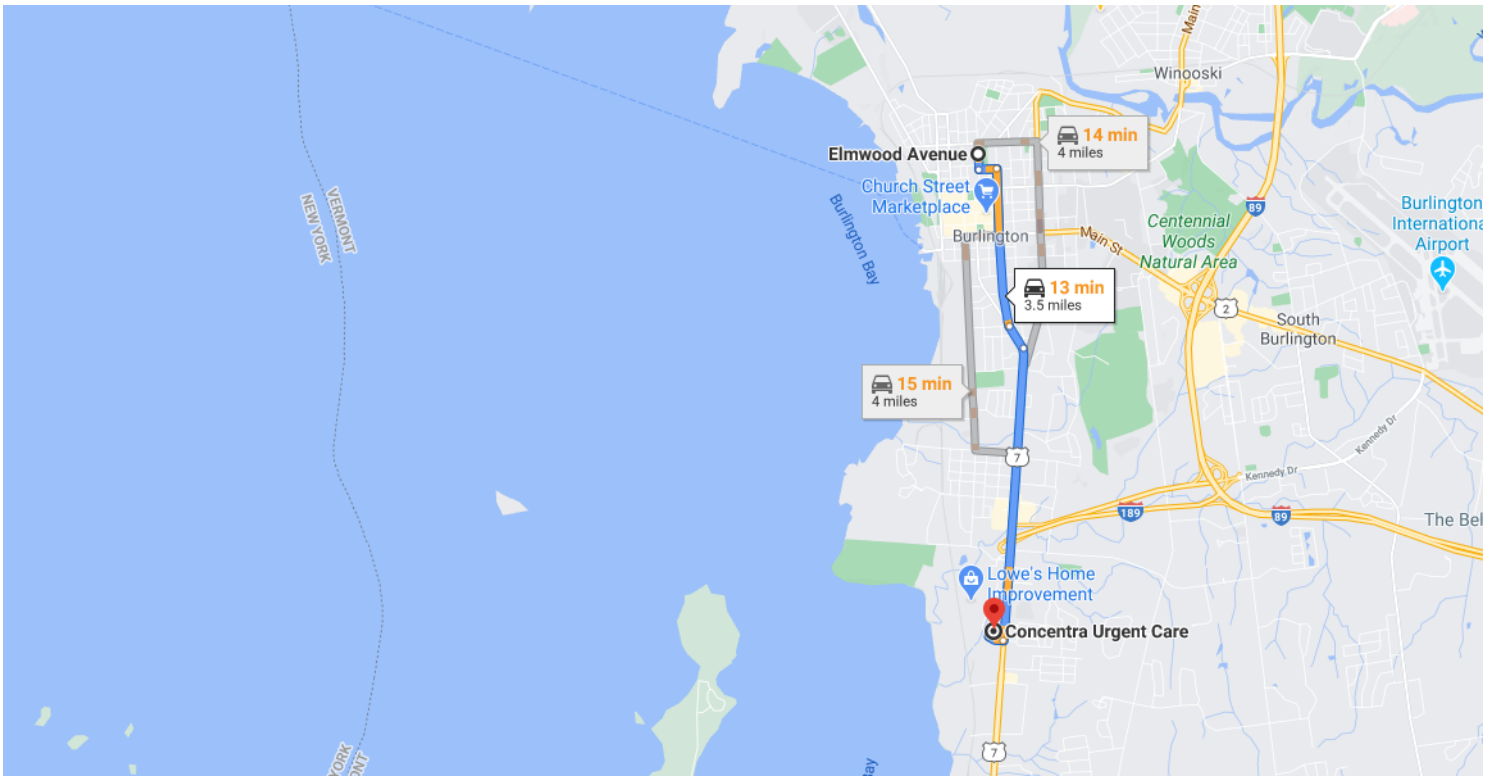
57 Fayette Dr STE 4, South Burlington, VT 05403

SEE ATTACHED GOOGLE MAPS BELOW

EMERGENCY MEDICAL ROUTE TO HOSPITAL



ROUTE TO OCCUPATIONAL CLINIC



EMERGENCY ASSEMBLY LOCATION

Southern End of Work Area*:* Dependent on the site's hazards and work location, the exact location of the emergency assembly location will be communicated during the daily tailgate safety meeting.

FIRST-AID MEASURES

In the event that an employee exhibits symptoms of exposure, contact **CORE Health Networks** immediately for phone assessment of injury/illness. The following procedures will be used:

Class of contaminant: PCE/TCE contaminated sewer pipe materials and potentially soils

Eye Contact: Flush eye immediately with copious amount of water for a minimum of 15 minutes. Repeat until irritation is eliminated and seek medical attention.

Skin Contact: Wash exposed area with soap and water for at least 15 minutes. If dermatitis or severe reddening occurs, seek medical attention.

Inhalation: Move the person into fresh air. If symptoms persist, seek medical attention.

Ingestion: Do not induce vomiting. Seek immediate medical attention.

IMPORTANT NUMBERS:

Title	Name	Phone Number
Project Manager:	Erik Urch	(802) 338-5926
Site Safety and Health Officer:	Harland Miller	(802) 238-6167
Site Supervisor:	Erik Gaster	(802) 622--4696
Regional Safety Coordinator:	Greg Fiedorowicz	(401) 302-2822
Client Contact:	Kim Caldwell	(802) 461-5857
State Utility Locate Service:	Digsafe	811

1.0 INTRODUCTION

All personnel and visitors who may enter work areas on this site must comply with the requirements of this Health and Safety Plan (HASP). All site personnel have the authority to "Stop Work" if unsafe conditions are present.

1.1. Scope and Applicability of the Site Health and Safety Plan

This HASP has been prepared by Atlas for the activities associated with the removal, sampling and replacement of contaminated sewer pipe in Elmwood Avenue.

The principal hazardous chemical contaminants in the sewer pipe and potentially soil at the site are expected to be PCE/TCE. Appendix B contains Safety Data Sheets (SDS) for the potential onsite contaminates.

The health and safety protocols established in this HASP are based on the Atlas Health and Safety Policy Manual, the Occupational Safety and Health Administration (OSHA) Regulations, past field experiences, specific site conditions, and chemical hazards known or anticipated to be present from available site data. The following HASP is intended solely for use during the proposed activities described in the project documents and technical specifications. Specifications herein are subject to review and revision based on actual conditions encountered in the field during site characterization activities. Such changes must be listed on the HASP List of Approved Amendments and/or Changes (see Appendix C).

Before site operations begin, all employees, including subcontractors for Atlas working on this project site will have read this HASP and all revisions. Such changes must be listed on the HASP List of Approved Amendments and/or Changes (see Appendix C). By signing this form all individuals recognize the requirements of the HASP, known or suspected hazards, and will adhere to the protocols required for the project site.

Before site operations begin, all employees, including subcontractors for Atlas working on this project site will have read this HASP and all revisions. Before work begins, all affected workers will sign the HASP Acknowledgement Form (see Appendix C). By signing this form, all individuals recognize the requirements of the HASP, known or suspected hazards, and will adhere to the protocols required for the project site.

1.2. Historical Overview

The property at 222 Elmwood Avenue (Site #2017-4734) operated as a dry cleaner with documented PCE usage since the 1950s and appears to have discharged PCE waste into the municipal sewer system. The waste appears to have accumulated in the areas of piping defects, adsorbing into the VCP materials and off-gassing into surrounding soils, which appears to have created a vapor cloud that is impacting residential buildings via the vapor intrusion pathway. The objective of the project is to remove, dispose and replace the contaminated sewer materials with the expectation that this would remove or assist in reductions to the vapor cloud.

1.3. Visitors

All visitors to the site must participate in a site H&S discussion that informs them of the hazards at the site and the potential activities that Atlas or its subcontractors are performing. All visitors must sign the Atlas Visitors Log (see Appendix C).

Visitors are not allowed in the work area while work is being performed unless properly trained and are wearing the required PPE.

1.4. Subcontractor Activities

All subcontractors used at the Site have been pre-approved in the Atlas Subcontractor Prequalification System or through Atlas' manual subcontractor approval process.

Subcontractor Details	
Name of Subcontractor:	TBD
Contact Name:	TBD
Contact Phone Number:	TBD
Anticipated Dates Onsite:	TBD
Activities to be Performed:	TBD

2.0 PROJECT ORGANIZATION

The following are specific roles and responsibilities for key site personnel.

2.1. Project Manager (PM)

The Project Manager (PM) has the primary responsibility for the fulfillment of the terms of the contract and overseeing operations for the purpose that includes meeting company legal and safety requirements. It is the PM's responsibility to manage the scope of the project, provide for the H&S of all employees working and communicate with the Client regarding the progress toward project goals. The PM will inform the Regional Safety Coordinator (RSC) of all HASP modifications, violations and incidents. The PM responsibilities include:

- Provide personnel time to read and understand the HASP and complete any training required to work on the project site.
- Conduct project start-up health and safety briefing for onsite personnel and subcontractors.
- Check that each subcontractor is approved in Atlas' subcontractor system and that each subcontractor's site workers have appropriate training.
- Verify Atlas employees are medically cleared and have completed all necessary training.
- That hazards identified during any site audits or while working are corrected. If necessary for immediate hazards, shut down field operations if hazards cannot be corrected or the hazards present an immediate threat to life and health.
- Develop HASP.
- Determine and provide all necessary safety systems and PPE.

2.2. Site Supervisor

The Site Supervisor is responsible for field operations and reports to the Project Manager and is the onsite coordinator and overseer of operations. It is their duty to supervise the site personnel, coordinate the activities of the subcontractor personnel and verify that the scope of work is followed and modified, when necessary. The Site Supervisor's specific responsibilities include:

- Executing the work plan and schedule as detailed by the Project Manager
- Coordination with the SSHO on health and safety issues
- Ensuring site work compliance with the requirements of the HASP

2.3. Site Safety and Health Officer (SSHO)

The site Safety and Health Officer (SSHO) has the responsibility and authority to implement this HASP and to verify compliance. The SSHO reports to the Project Manager. The SSHO is on-site during all work operations and has the responsibility to halt site work if unsafe conditions are detected or if deviations in the work plan occur. The responsibilities of the SSHO at the site include the following:

- Managing the H&S functions on the site;
- Ensuring compliance with the HASP and use of PPE;
- Conducting daily Tailgate Safety Meetings for site personnel and subcontractors. The following topics should be covered:

  - Hazard Communication (i.e., SDS location, proper PPE to be used, chemical hazards of non-routine tasks).
  - Work zone setup and equipment movement
  - Review of all applicable JSA(s).
  - Discuss tasks to be performed, associated hazards and procedures to protect employees from those hazards.
  - Review site safety requirements.
  - Review site emergency procedures
- Conducting daily safety inspections of the site looking for unsafe acts or conditions and providing corrective action as appropriate.

2.4. Regional Safety Coordinator (RSC)

The Regional Safety Coordinator (RSC) is responsible for providing professional health and safety advice to the project. The RSC will review and provide support for concerns regarding the health and safety of field personnel assigned to this project, including:

- If requested by the Project Manager, review and approval of HASP;
- Review of incident reports, inspections and air monitoring results;
- When required, the RSC will conduct a field audit of the site to evaluate the adequacy of the protective measures and work with the PM to implement any necessary changes.

2.5. Field Personnel

The field personnel include technicians, engineers, scientists, geologists and subcontractors who perform work on this site. Each individual team member will be responsible for understanding and personally complying with the requirements of this HASP. Field personnel will report health and safety violations to either the site Supervisor or the SSHO. H&S responsibilities, as discussed in this HASP that are shared by all site personnel include:

- Complying with the requirements of the HASP
- Reporting unsafe acts or conditions
- Wearing correct PPE for the task
- Stopping any unsafe work
- Following the JSA and/or correct steps for a task.
- Assist other field personnel with being safe and meeting the requirements of this HASP.

3.0 TASK/OPERATION HEALTH AND SAFETY RISK ANALYSIS SUMMARY

This chapter describes the identified and anticipated hazards associated with this site based on the environmental conditions, tasks to be performed and the control measures necessary to protect workers from these hazards. The assessment looked at the general, chemical, physical and biological hazards that may be encountered while working on this site. Using this information, appropriate control methods are selected to eliminate the identified risks or effectively control them.

3.1. Job Safety Analysis (JSA)

The purpose of the JSA is to identify the routine health and safety hazards associated with the routine site tasks and operations. JSAs for the anticipated tasks that will be performed onsite are maintained in Appendix A. A single JSA may be used for a task/operation performed in multiple locations if the hazards, potential exposures and controls are the same at each location. Field personnel are expected to modify JSAs for the site as new hazards are identified and create JSAs if one is not available for a task that will be performed.

3.2. Chemical Exposure Assessment

Hazardous chemicals may be used on the site to support site operations. The Atlas H&S Policy No. 08 – Hazard Communication Program requires Atlas to provide employees, contractors, subcontractors and visitors with information on the health effects of these chemicals and necessary actions to protect against exposure. This information is transmitted through Safety Data Sheets (SDS), container labels, training and a written Hazard Communication Program.

Site activities will adhere to the Program as described in the Atlas Policy. All site personnel, including subcontractors, will be briefed on the Program as part of the site orientation training before starting work. In accordance with this Program, the PM and/or SSHO will check that each chemical brought to the site is accompanied by its SDS. A copy of each SDS will be maintained and be made available to each site personnel who may be potentially exposed to the chemical. In addition, the SSHO will check that all subcontractors bring at least one copy of SDS for each chemical they bring onto the site. The SSHO will also check that all chemical containers brought to the site are labeled as to its contents and appropriate hazard warnings according to the Program. The location of all SDSs will be identified during the daily tailgate safety meeting and may be included in Appendix B of this HASP or maintained in a separate area.

3.3. Potential Chemical Hazards Associated with the Project Site

The following chemical hazard evaluation for the project site is based on historical and previous investigations of the site. The evaluation has been conducted to identify hazardous substances that potentially may be present at the site and to ensure that work activities, PPE and emergency response are consistent with the specific contaminants that could be encountered.

Chemical impacted material has been identified on the site. The potential contaminants that might be encountered during the field activities and exposure limits are listed below.

3.3.1. Table 3-1 Chemical Time Weighted Averages, PEL's and STEL's (if applicable).

Name (Constituent)	PEL	TWA (8hr)	STEL
Tetrachloroethylene (dry cleaning components)	25 ppm 170 mg/m^3	25 ppm 170 mg/m^3	100 ppm

**N/E – Not Established by OSHA or NIOSH.

3.4. Chemical Hazard Exposure Routes

Exposure routes for chemical impacted material:

- Inhalation of dust, vapor, particulates or due to the presence of hazardous materials from soil or sewer pipe materials.
- Ingestion of soils/sewer pipe media via hand to mouth contact.
- Absorption through the skin from contact with contaminated soil/sewer pipe media.

To protect field personnel, the following procedures will be used as needed:

- Establishment of work zones
- Use of PPE
- Decontamination procedures
- Atmospheric monitoring

3.5. Noise Hazards and Controls

Exposure to high levels of noise may occur when working near heavy equipment, tools and remediation systems. Depending upon the environment surrounding the project site airports, factory machines, etc. may produce high levels of noise. Employees exposed to noise levels in excess of the action level of 85 decibels (A-weighted, Slow Response) will be included in a Hearing Conservation Program according to Atlas H&S Policy No. 47 – Hearing Conservation. The SSHO may evaluate employee noise exposures using a noise survey meter or a noise dosimeter. The RSC may conduct additional noise monitoring to determine the appropriate response to be taken. Employees will be provided with ear plugs and/or earmuffs when exposed to noise levels in excess of the 8-hour Permissible Exposure Limit (PEL) of 90 decibel (A-weighted, Slow Response). This hearing protection must have a Noise Reduction Rating (NRR) to protect hearing in accordance with Policy No. 34 and reduce the exposure level to below 90 dba.

3.6. Biological Hazards

Site activities may expose workers to other hazards such as poisonous plants, insects, animals, and indigenous pathogens. Protective clothing and respiratory protection equipment and training on how to identify poisonous plants, animals and insects, can greatly reduce the chances of exposure. Thoroughly washing any exposed body parts, clothing, and equipment will also protect against infections. If working in wooded/grassy areas, use appropriate insect repellants (containing DEET and/or Permethrin) and apply per the manufacturers' directions.

3.6.1. Poison Oak, Poison Sumac, Poison Ivy

- Avoid contact with plants.

- Use barrier products such as IvyX Pre-contact, IvyBlock, or other products on exposed skin where potential direct contact or contact through clothing is possible. Re-apply periodically throughout the day to exposed skin.
- Cover as much skin as practical; wear long sleeves, long pants, socks, boots, gloves, neckerchiefs, hats and other clothing articles. Wear impermeable gloves over cotton/leather gloves.
- Remove gloves before eating or taking bathroom breaks. Clean hands thoroughly with Tecnu, IvyX post-contact, or other product before eating or bathroom breaks. Ensure you do not touch your face or hands with a contaminated glove or other article of clothing.
- Separate contaminated field clothing and wash in hot water. Heavy contaminations may not be able to be removed and the clothing will need to be discarded.
- Clean all objects that may have urushiol on its surface. Besides clothing, urushiol can stick to many surfaces, including tools and equipment.
- Protect your vehicle interior by placing a large towel or bedsheet over the seats. Wash hands with Tecnu before and after removing contaminated clothes.
- Wash contaminated skin with Tecnu, IvyX Post-contact, or other product immediately. Do not delay since urushiol takes only a few minutes to affect your skin.
- Shower (do not take a bath) and thoroughly wash your entire body with warm, soapy water as soon as possible.
- Dermatitis can present in many forms which include itchy skin, redness or streaks, hives, swelling, small or large blisters or scabs after bursting after urushiol exposure.

3.6.2. Ants

- Look at your surroundings during site setup. If present in large numbers move the work area. If unable to move the work area stop work and contact the PM.
- Workers should take the following steps to prevent fire ant stings and bites:
- Do not disturb or stand on or near ant mounds.
- Be careful when lifting items (including animal carcasses) off the ground, as they may be covered in ants.
- Fire ants may also be found on trees or in water, so always look over the area before starting to work.

3.6.3. Bee/Hornets/Wasp

- Look at your surroundings during site setup. If present in large numbers move the work area. If unable to move the work area stop work and contact the PM.
- Bees, wasps, and hornets are most abundant in the warmer months. Nests and hives may be found in trees, under roof eaves, in attics or on equipment such as ladders.
- Avoid perfumed soaps, shampoos, and deodorants.
- Wear clothing to cover as much of the body as possible.
- Remain calm and still if a single stinging insect is flying around. (Swatting at an insect may cause it to sting.)
- If you are attacked by several stinging insects at once, run to get away from them. (Bees release a chemical when they sting, which may attract other bees.)
- If a bee comes inside your vehicle, stop the car slowly, and open all the windows.

- Workers with a history of severe allergic reactions to insect bites or stings should consider carrying an epinephrine auto injector (EpiPen) and should wear a medical identification bracelet or necklace stating their allergy.

3.6.4. Ticks

- Avoid vegetation when possible. Stay to the center on trails where the vegetation is the shortest.
- Be especially vigilant if vegetation contacts your body above your knee. Remember that ticks find a place on vegetation to lie in wait until a host comes along and brushes across them.
- Apply CDC-recommended insect repellents: DEET or permethrin according to label directions up to, and above, parts of body and clothing where contact with vegetation occurs.
- DEET is most effective in higher concentrations from 20-30% (Deep Woods OFF! & Cutter Backwoods). Spray directly onto your exposed skin. Apply to face by spraying hands and then wiping on skin avoiding eyes and mouth.
- Reapplication throughout the day is needed since it only works while volatilizing.
- Do not apply DEET to skin underneath clothing.
- Permethrin is more effective at repelling ticks than DEET and is applied to clothing only.
- Re-application each day is not needed since it is effective on clothes for several consecutive days and after laundering. Launder separately from other clothes. Do not apply permethrin to your skin.
- For best protection apply permethrin to clothing, including footwear, socks and hats, and DEET to exposed skin.
- Always tuck shirt into pants and tuck pants into tightly woven socks. Small ticks can crawl through the fabric of some socks. Wear a hat to cover your exposed head.
- Check for ticks on clothing during field work and at every rest break.
- At the end of the day, before entering your vehicle, do a thorough tick check with your field partner.
- Reapply permethrin to clothing to knock down ticks and prevent them from entering the vehicle with you.
- As soon as possible after field work, remove clothing and check yourself before conducting office work. Check again while bathing and changing. Be sure to look closely and feel carefully for small, nymph “seed” ticks on waistline, neck, hairline, behind ears, under arms, and groin.
- Keep field gear and clothing out of living spaces and bag soiled field clothes until washing (separately in hot water).
- If you discover an embedded tick, call Core Health. Nurses there can help you with first aid and remind you of the symptoms to be alert for afterward.

3.6.5. Snakes

- Walk only as fast as you can watch the path ahead. If you see a snake, back away slowly. Most snakes avoid people if possible and bite only when threatened or surprised.
- When working in known snake habitats, snake gaiters must be worn by all site employees.
- Do not place your hands or feet in locations where you cannot see the surrounding area.

- When possible, avoid areas of tall vegetation.
- Tap or poke the ground ahead of you with a walking stick before entering an area where you can't see your feet. Snakes will try to avoid you if given enough warning.
- When in an area known to have snakes, wear long pants and boots. If work must be conducted in areas with tall grass or other cover where snakes may be present, also wear snake gaiters.
- Never handle a snake. Even non-venomous snakes can bite and cause serious injury.

3.6.6. Dogs

- If an unsecured dog is seen on or near the project site, stop work and all employees are to take shelter in a building or vehicle until the dog leaves the area or the dog is secured by authorities or its owner. Contact animal control if the dog does not leave on its own.

3.7. Lightning

Weather conditions can change quickly when working. In the event lightning is seen, thunder is heard, or storm notifications in the area are issued, all outdoor work must stop and all onsite employees are to take shelter inside a building or vehicle. Work can resume 30 minutes after the last observed sign of lightning, sound of thunder and the threat of subsequent storm activity is deemed safe. Before resuming work, onsite employees should contact the Project Manager to determine if additional storm activity will be occurring. The use of online weather activity maps (webpages), weather applications, and public safety notification services, can be very helpful when assessing approaching storms in the area. If storm activity will continue, onsite employees should secure the site and either reschedule work or wait in a building or vehicle until the storm activity (see above) is no longer a threat.

3.8. General Public

When working in unsecured locations onsite employees must setup a work zone that keeps the general public away from or provides a barrier to any hazards created by the work performed onsite.

All employees are expected to treat the general public respectfully and to limit our engagement and interaction. In the event an employee feels threatened by the general public; work must stop, and the employee should seek protection in a building, withdraw from the area and/or contact local authorities. Work should only resume when the threat has been eliminated.

3.9. Hand and Power Tools

In order to complete the various tasks for the project, personnel will utilize hand and power tools. The use of hand and power tools introduce a variety of hazards including injury from being struck by flying objects, cut or struck by the tool, fire and electrocution. Proper PPE must be worn while using these tools. Ground Fault Circuit Interrupters (GFCIs) are required for all portable corded electric tools.

For specific PPE and procedures associated with a tool see the JSA for the task in which the tool is being used and the manufacturer’s instruction manual.

3.10. Slip, Trip and Falls

Working in and around the project site will pose slip, trip and fall hazards due to equipment, tools/supplies and slippery surfaces from weather and from activities performed onsite. Good

housekeeping must be maintained at all times. Tools and equipment no longer in use must be removed from the work area and secured. Traction control devices must be worn when working on slippery surfaces. A general site walk should be conducted prior to the start of work to identify trip hazards. These identified trip hazards should be correct or visibly marked to warn onsite employees.

3.11. Material Handling

Proper manual lifting of material will be required by site personnel and if not done correctly could result in injury. No one is to lift any object greater than 50 pounds or any object that is large or awkward by themselves. If possible, the use of equipment and tools to help lift and move the material is required.

Employees must be trained on proper lifting techniques prior to arriving at the project site.

3.12. Fire and Explosion

All equipment used to transfer flammable material, including contaminated soil or water must be grounded and bonded to prevent static buildup. An appropriately rated fire extinguisher must be maintained and available for use on site.

3.13. Moving Equipment

Field personnel working in the immediate vicinity of heavy equipment may encounter injuries from contact from the equipment.

Spotters must be used when heavy equipment is used onsite or moving from one location to another and the route and designation discussed with all site personnel prior to movement. Equipment must be equipped with back up alarms.

All site employees must wear at least an ANSI class 2 reflective vest or shirt.

3.14. Vehicular Traffic

Work zones will be established out of local traffic patterns whenever possible and clearly marked. All site personnel must wear high visibility PPE based on the amount and speed of the traffic.

3.15. Heat Stress

All employees and visitors, must adhere to the following procedures when heat stress conditions exist.

The SSHO will have training in first-aid and Cardiopulmonary Resuscitation (CPR), including training in heat-related illnesses. The SSHO must also be trained on the requirements of the Atlas Policy for Industrial Hygiene (Policy No. 31), which contains the requirement for heat stress monitoring. All workers should be capable of recognizing and treating the signs and symptoms of heat stress conditions. During potential heat stress conditions, ice should be readily available to rapidly cool victims.

Water will be made available at the site for employee fluid replacement. When heat stress is a hazard, employees will be provided with balanced, electrolyte solutions to replace fluid and electrolyte loss. Employees will be provided with replacement fluids at a minimum rate of 8 ounces every 15 to 20 minutes per person.

Acclimatization is a gradual physiological adaptation that improves an individual's ability to tolerate heat stress. Full-heat acclimatization requires up to 3 weeks of continued physical activity under heat-stress conditions similar to those anticipated for the work. Acclimatization loss begins when the work activity in heat stress conditions is discontinued. A noticeable loss usually occurs within 3 – 4 days.

3.16. Rest Breaks

All rest breaks will be taken out of the zone of exclusion in a cooler, shaded, rest area. The frequency of rest breaks will be based on the level of physical activity, temperature and humidity and will be discussed during the daily tailgate meeting. At any time, the frequency of rest breaks can be increased if the SSHO or other site employees determine it to be necessary.

Heat stress and heat strain are conditions resulting from environmental factors including temperature, relative humidity, radiant heat transfer, and air movement, as they are affected by clothing. The primary objective of the heat stress management program is to prevent heat stroke which is life threatening and the most serious of the heat-induced disabilities. Extra caution should be taken for workers who are not acclimated to working in the heat.

The following Heat Stress Index should be used as a guide to evaluate heat stress situations.

3.16.1. Table 3-2: Heat Stress Index

Heat Stress Index									
Temp. °F	Relative Humidity								
	10%	20%	30%	40%	50%	60%	70%	80%	90%
105°	98°	104°	110°	120°	132°				
102°	97°	101°	108°	117°	125°				
100°	95°	99°	105°	110°	120°	132°			
98°	93°	97°	101°	106°	110°	125°			
96°	91°	95°	98°	104°	108°	120°	128°		
94°	89°	93°	95°	100°	105°	111°	122°		
92°	87°	90°	92°	96°	100°	106°	114°	122°	
90°	85°	88°	90°	92°	96°	100°	106°	114°	122°
88°	82°	86°	87°	89°	93°	95°	100°	106°	115°
86°	80°	84°	85°	87°	90°	92°	96°	100°	109°
84°	78°	81°	83°	85°	86°	89°	91°	95°	99°
82°	77°	79°	80°	81°	84°	86°	89°	91°	95°
80°	75°	77°	78°	79°	81°	83°	85°	86°	89°
78°	72°	75°	77°	78°	79°	80°	81°	83°	85°
76°	70°	72°	75°	76°	77°	77°	77°	78°	79°
74°	68°	70°	73°	74°	75°	75°	75°	76°	77°
NOTES: Add 10° F when protective clothing (use of a respirator and/or chemical protective clothing such as Tyvek, arch flash or flame resistant) is being used; Add 10° F when in direct sunlight.									

HSI Temp	Category	Injury Threat
> 130° F	Extreme Danger	No work unless emergency exists. Contact Atlas RSC and Corporate H&S Group prior to proceeding. Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
105°-130° F	Danger	Contact RSC prior to proceeding. Requires strict adherence to ACGIH Heat Stress Guidelines, including use of on-site WBGT equipment. Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
90°-105° F	Extreme Caution	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
80°-90° F	Caution	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
< 80° F	Normal Range	Typical conditions for time of year. Little or no danger under normal circumstances. As always, anticipate problems and work safely.

3.17. Cold Stress

This procedure applies to all employees who perform field work in cold environments at risk of cold stress injury and intended to protect workers from the most severe effects of cold stress.

Atlas site employees have been trained in cold stress as part of their HAZWOPER 40-hour initial training, site workers will receive refresher training by the SSHO in cold stress safety and health procedures. The training program will include, as a minimum, instruction in the following areas:

- Proper first-aid treatment
- Proper clothing practices
- Proper eating and drinking habits
- Recognition of impending frostbite
- Recognition of the signs and symptoms of impending hypothermia or excessive cooling of the body when shivering does not occur
- Safe working practices

The SSHO will be trained in first aid, CPR and cold stress conditions.

Frostbite and hypothermia are two types of cold injury that personnel must be protected against during the performance of field duties. The objective is to prevent the deep body temperature from falling below 96.8° F and to prevent cold injury to body extremities. Two factors influence the development of a cold injury; the ambient temperature, and wind velocity.

The SSHO will monitor environmental conditions by recording ambient temperature and estimated wind-speed. Information contained in Tables 3-3 will be used to evaluate the possibility of hypothermia among workers on-site. No work will be conducted when the temperature and wind speed combine for a temperature of less than -20° F.

Use appropriate cold weather clothing when temperatures are at or below 40°F as exposed skin surfaces must be protected. These protective items can include facemask, hand wear, and foot wear. Workers handling evaporative solvents during cold stress conditions will take special precautions to avoid soaking gloves and clothing because of the added danger of prolonged skin contact and evaporative cooling. Personnel will wear protective clothing appropriate for the level of cold and planned physical activity. The objective is to protect all parts of the body, with emphasis on the hands and feet. Eye protection against glare and ultraviolet light should be worn in snowy and icy conditions.

The work rate should not be so great as to cause heavy sweating that could result in wet clothing. If heavy work must be done, opportunities for rest breaks will be provided where workers have the opportunity to change into dry clothing. Conversely, plan work activities to minimize time spent sitting or standing still. Rest breaks should be taken in a warm, dry area. Windbreaks can also be used to shield the work area from the cooling effects of wind.

When frostbite, hypothermia, or other cold stress symptoms are suspected, treat the patient to relieve symptoms or transport them to the medical facility identified in this HASP.

3.17.1. Table 3-3: Hypothermia Evaluation

Estimated Wind Speed (mph)	Actual Temperature Reading (˚F)											
	50˚	**40˚**	**30˚**	**20˚**	**10˚**	**0˚**	**-10˚**	**-20˚**	**-30˚**	**-40˚**	**-50˚**	**-60˚**
	Equivalent chill Temperature (˚ F)											
Calm	50˚	40˚	30˚	20˚	10˚	0˚	-10˚	-20˚	-30˚	-40˚	-50˚	-60˚
5 mph	48˚	37˚	27˚	16˚	6˚	-5˚	-15˚	-26˚	-36˚	-47˚	-57˚	-68˚
10 mph	40˚	28˚	16˚	4˚	-9˚	-24˚	-33˚	-46˚	-58˚	-70˚	-83˚	-95˚
15 mph	36˚	22˚	9˚	-5˚	-18˚	-32˚	-45˚	-58˚	-72˚	-85˚	-99˚	-112˚
20 mph	32˚	18˚	4˚	-10˚	-25˚	-39˚	-53˚	-67˚	-82˚	-96˚	-110˚	-121˚
25 mph	30˚	16˚	0˚	-15˚	-29˚	-44˚	-59˚	-74˚	-88˚	-104˚	-118˚	-133˚
30 mph	28˚	13˚	-2˚	-18˚	-33˚	-48˚	-63˚	-79˚	-94˚	-109˚	-125˚	-140˚
35 mph	27˚	11˚	-4˚	-20˚	-35˚	-51˚	-67˚	-82˚	-98˚	-113˚	-129˚	-145˚
40 mph	26˚	10˚	-6˚	-21˚	-37˚	-53˚	-69˚	-85˚	-100˚	-116˚	-132˚	-148˚
(Wind speeds > 40 mph have little additional effect)	**LITTLE DANGER** If < hour with dry skin. Maximum danger of false sense of security				**INCREASING DANGER** Danger from freezing of exposed flesh within one minute.			**GREAT DANGER** Flesh may freeze within 30 seconds.				
	Trench foot and immersion foot may occur at any point on this chart.											

* Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA

4.0 AIR MONITORING AND PERSONAL PROTECTIVE EQUIPMENT

4.1. Site Air Monitoring Requirements

This section of the HASP is based on chemical exposure to contaminated soil and sewer pipe media.

To prevent exposure to hazardous atmospheres and aid in the selection of respiratory protection, monitoring for the presence of airborne contaminants will occur when knowledge of the site indicates their potential presence. One or more of the following direct-reading instruments may be used to aid in this determination;

- Photoionization Detectors (PID) and
- Flame Ionization Detectors (FID) will measure non-specific organic gases and vapors.
- Combustible Gas Indicators (CGI) will detect explosive atmospheres.
- Oxygen (O_2) meters will detect fluctuations in oxygen concentrations.

These instruments should be calibrated or bump tested daily and whenever the readings may be erratic. All readings should be recorded in the field log books according to the monitoring program. All employees responsible for using these devices must be shown how to properly calibrate and configure the equipment. A manual on how to use the equipment must always be maintained with the equipment.

All direct-reading instruments or equipment that are needed to monitor for hazardous atmospheres on this project site are listed in Tables 4-1, 4-2 and 4-3.

The breathing zone of the employee(s) anticipated to have the highest potential for exposure for each task will be monitored using an appropriate combination of some or all of these direct-reading instruments. Air monitoring will occur every 15 minutes during non-intrusive activities, or every 5 feet of penetration during intrusive activities. Site tasks and air monitoring requirements are shown in Table 4-1. Additional site monitoring may occur at the discretion of the SSHO, site supervisor, or RSC.

The trench airspace and ambient air within the work zone surrounding the trench should be periodically screened with a PID to evaluate worker exposure levels to PCE, which has been detected up to approximately 70,000 µg/m^3 (10 ppm) in shallow soil vapor in the general vicinity of the excavation area. It is not expected that sustained readings exceeding the PEL of 25 ppm will be encountered in ambient airspace due to the open environment as the PEL is higher than the peak subsurface concentrations. As such, this HASP assumes no engineering controls will be required for worker protection and that Level D PPE will be appropriate. However, as a contingency, the Contractor should be prepared to ventilate the trench with a blower if required.

All air monitoring equipment must be calibrated as per manufacturer's instructions.

If any of the action levels listed in Tables 4-2 or 4-3 are met, work must immediately stop. No employee is authorized to work in conditions that require respiratory protection without first contacting your RSC. If any of the action levels listed in Table 4-2 or 4-3 are met, work must immediately stop. Contact must be made with the PM informing them that the Respiratory Protection Plan, Appendix H will be followed.

4.1.1. Table 4-1: Site Air Monitoring Requirements

Site Activity	Instrument	Frequency	Location	Caution
Site Excavation and Construction Activities	PID	Every 15 minutes or 5 feet of penetration / Ongoing, during soil excavation	In work area near activity	Communicate with equipment operator before sampling

Air monitoring results obtained from the breathing zone during field activities will be recorded in field logbooks on an ongoing basis as part of the standard data that is recorded. The Air Quality Monitoring Record will be completed if a PID reading >10 ppm is measured, see Appendix A.

The action levels were developed using the following assumptions.

- Atlas assumed the primary substance is PCE with PEL of 25 ppm.

Air monitoring information will be utilized to evaluate personnel exposure and assess the need for respiratory protection. PID readings measured in the employees breathing zone will be used to determine the level of protection required. PID readings refer to readings above background, which are sustained for at least 5 minutes and are measured during the performance of field tasks.

4.2. Action Levels for Respiratory Protection

The first and foremost means of protecting employees from injuries or exposures is to eliminate the exposure. The general hierarchy for controlling potential exposures is: (1) engineering controls; (2) administrative controls; and (3) the use of PPE. PPE is a means of preventing injury or exposure when exposure elimination and/or other control means are not feasible.

The initial level of protection and the upgrading to respiratory protection action levels at which the PPE will be upgraded are determined based on the identification of specific chemicals expected to be present at a site and the established OSHA Permissible Exposure Levels (PEL) or ACGIH Threshold Limit Values (TLVs), whichever is lower. In the event more than one chemical is expected or exists at a site, the most hazardous chemical will dictate the level of personal protection required. Table 4-2 and -3 shows the action levels for levels of personal protection equipment.

4.2.1. Table 4-2: Action Levels for Petroleum Contaminate Soil/Water

Monitoring Equipment	Hazard	Action Level Above Background	Action
PID/FID	Organic gas/vapor	< 10 ppm	Level D.
		10 to 50 ppm	Level C. Move upwind and continue air monitoring, cease operations, or use detector tube(s) for (contaminant) and reference Table 4-3 below.
		> 50 ppm	Immediate Withdrawal. Contact the PM and RSC for further instructions to proceed.
CGI	Explosive Atmosphere	< 10 % LEL	Level D.
		> 10 % LEL	Immediate Withdrawal. Explosive hazard. Contact the SSHO and RSC for further instructions.
Oxygen Conc. Meter	O_2 Conc.	< 19.5 %	Immediate Withdraw. Combustible gas readings are not accurate below this concentration! Notify SSHO.

4.3. Levels of Protection

The protection levels may include all or some of the following, based on work scope.

4.3.1. Level D:

- See Section 8.0 of this HASP for minimum PPE requirements.

4.3.2. Level C:

- Half-face or full-face, air purifying respirator (NIOSH approved) with organic vapor cartridge. Refer to the Respiratory Protection Plan.
- Disposable, hooded, chemical-resistant clothing*
- Disposable, chemical-resistant outer gloves
- Disposable, inner nitrile gloves (8 mil minimum)
- Chemical-resistant boots with steel toe
- Disposable boot covers*
- Hard hat*
- Goggle
- Face Shield*
- Coveralls*
- Hearing protection*

4.4. Respiratory Protection

Respiratory protection requirements for employees are described in detail within Appendix H - Respiratory Protection Plan. Basic rules of respiratory usage are listed below:

- Facial hair that contacts or interferes with the seal of the mask-to-face is not allowed on personnel required to wear respirators.
- Respirator cartridges should be replaced after approximately 8-hours of continuous or intermittent usage, unless otherwise noted. Cartridges should also be replaced if they become damaged, after the expiration date is exceeded, if breakthrough (smell and/or taste) occurs or if filters become clogged causing resistance to breathing.
- Contact lenses may be worn when respiratory protection is required, in conjunction with additional eye protection to protect against particles or splashes, provided there is no interference with the respirator seal and the chemical in the atmosphere does not prevent their use.
- Respirators must be cleaned and disinfected after each day's use or more often, if necessary.
- Prior to donning, respirators will be inspected for worn or deteriorated parts. Emergency respirators or self-contained devices will be inspected at least once a month and after each use.
- After donning, personnel should perform a positive and negative user fit-check to determine if a good seal has been achieved.
- Any employee assigned a respirator or required to wear a respirator will receive an annual medical evaluation, annual respirator fit test and receive respiratory protection training.

5.0 HEALTH SURVEILLANCE PROGRAM

5.1. Employee Medical Examinations

All Atlas employees involved in work at this site will participate in Atlas' Medical Surveillance Program administered by Atlas' medical management provider. Atlas has worked with its medical

provider to develop a medical exam that evaluates employees for potential chemical exposure. The medical examinations provided to Atlas employees meet the requirements in 29 CFR 1910.120(f).

Any subcontractors or visitors that will work in an area where there is potential for exposure to onsite contaminates must also undergo a medical exam that meets 29 CFR 1910.120(f) and be cleared by a physician to work.

When respirators are required as determined by section 4.0 of this HASP, each employee will also have current respirator clearance.

The PM for this project site is responsible for checking on the medical clearance for any Atlas employee working on this site.

A post-project, follow-up exam may be required if an exposure incident is reported or an employee shows specific symptoms associated with the known or suspected hazardous chemicals. The RSC and the Project Manager will determine when post-project exams are required.

6.0 SITE SECURITY AND CONTROL

6.1. Work Zones

Restricted site areas will include, but not necessarily be limited to, the following zones:

- Exclusion Zone or Hot Zone - any area where contamination is either known or likely to be present in concentrations that could pose a threat to human health and safety or that potential for harm to personnel exists because of the type of work activities being conducted. Appropriate PPE and warning signs should be utilized in this area.
- Contamination Reduction Zone - any area where workers conduct personal and equipment decontamination.
- Support Zone - areas where access is controlled, but the chance to encounter hazardous materials or conditions are minimal.

Access to the work zones will be controlled by work zone delineators (e.g. traffic cones, flags, vehicles, DOT approved devices, temporary or permanent fencing, and/or safety barrier tape). Additionally, Atlas employees should follow the requirements of Atlas Policy No. 49, Work Zones in Traffic Areas for additional information. The delineation of the work zone will be discussed during the tailgate safety meeting.

In the event on-site personnel must upgrade their personal protective equipment, the work zones may require substantial modification in order to provide for the safety of nearby personnel not associated with this work. Any upgrade level will be communicated by the site supervisor to the PM. The PM will then inform the RSC of this occurrence.

6.2. Buddy System

The buddy system is preferred when working on this project site. The Buddy System means that personnel work in pairs and stay in close visual contact to be able to observe one another and summon rapid assistance in case of emergency.

6.3. Lone Worker

When working alone, no worker should be left without means of summoning help quickly. All lone workers at a minimum must have a phone with service coverage and carry identification with them. The minimum expectation for lone workers:

- Call the PM or BSO on arrival and departure.
- Provide an anticipated length of time on site and tasks to be performed.

The PM should attempt to contact the lone worker if they fail to check in at the designated time. If communication cannot be maintained, a STOP Work must occur.

6.4. Site Communication

Site communication may be in the form of hand signals, voice, or other communication devices. All forms of communication should be understood by all workers and discussed during the daily tailgate meeting prior to starting work.

6.5. Roadway Work Zones

When work is conducted in a city street or public right-of-way, the work zone and traffic control must be setup according to the Traffic Control Plan in accordance with the City Excavation Permit, to be arranged by the Contractor.

7.0 DECONTAMINATION PROCEDURES

All personnel and equipment must undergo appropriate decontaminated prior to leaving the project site. The decontamination of personnel and equipment will be performed within the exclusion and contamination reduction zones. The SSHO will visually watch the decontamination process and verify it is completed. The decontamination solution to be used onsite:

- Alconox/Liquinox and water for removal of low-molecular weight hydrocarbons, inorganic compounds, salts, some organic acids, and other polar compounds.
- Dilute acids (vinegar) for removal of basic (caustic) compounds, amines, and hydrazines.
- Dilute bases (soaps and detergents) for removal of acidic compounds, phenols, thiols, and some nitro and sulfonic compounds.
- Organic solvents for removal of nonpolar compounds (organic).

The hands and face of each employee must be thoroughly washed upon leaving the work area. Trash receptacles will be provided for all disposable PPE.

Field equipment will be decontaminated according to the work plan. This may include manual removal of gross contamination with shovels or other tools, followed by a high-pressure, hot water sprayer. Decontamination with high-pressure and hot water poses the possibility of a splash and/or mist inhalation hazard, the task should be performed using Level D personal protective equipment with a face shield at a minimum.

Field tool including split-barrel soil samplers, brass liners, and sample knives and trowels will be decontaminated. The field tools may be scrubbed visually clean using the decontamination solution with a stiff, long-bristled scrub brush. Following scrubbing with the decontamination solution, the tools may be rinsed with distilled water or isopropyl alcohol.

All materials and equipment used for decontamination should be disposed of in accordance with local, State, and/or Federal Regulations. Clothing, tools, buckets, brushes, and all other equipment that is contaminated must be properly packaged and stored on the site until disposal arrangements are finalized. Clothing not completely decontaminated on-site should be secured in plastic bags before being removed from the site and taken to an appropriate cleaning facility.

8.0 STANDARD OPERATING PROCEDURES (SOPS)

As tasks are performed, the JSA must be reviewed by all onsite workers to identify additional precautions that must be taken. Any changes to the SOPs must be approved by the PM and RSC.

At a minimum, the following PPE must be worn at all times by all workers and visitors to this project site:

- Hard hat
- Long pants
- Shirt with sleeves
- Safety glasses
- Safety toed boots with ankle support
- Work gloves – the type of gloves worn may change based on task being performed.
- ANSI Class 2 safety vest (other garments, jackets, and shirts that meet the class 2 requirements may be worn in place of the safety vest).
- See JSA for task to be performed for specifics on type of PPE and any additional PPE.

The following SOPs will apply when working on this project site:

- Eating, drinking, chewing gum, tobacco products or any item that could facilitate hand-to-mouth transfer of contaminates are prohibited in the exclusion and contamination reduction zone or in any area known to be contaminated. Personnel must wash their hands and face and remove any contaminated PPE before handling these items.
- When decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garment is removed.
- Contact with contaminated or suspected contaminated surfaces should be avoided. When possible, do not walk through puddles, leachate or discolored surfaces; kneel on the ground; lean, sit, or place equipment on drums, containers, or the ground.
- All personnel and visitors must be familiar with SOPs and any additional instructions and information contained in this HASP. All employees, visitors and subcontractors will read and sign an acknowledgement of the HASP before entering the site.
- All personnel must be or will be made aware of symptoms for heat or cold related illnesses.
- All personnel will be made aware of the location of the SDSs for the chemicals on-site.
- All loose clothing, jewelry, hair, or other items that could be caught in moving parts or snagged on equipment must be secured.
- All personnel going to the site must be trained on all tasks they are expected to perform and thoroughly briefed on anticipated hazards, equipment, safety practices, emergency procedures, and communications needed for this project site.
- Personnel on the site must use the buddy system when engaged in Level C, B or A work tasks. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

- Personnel unfamiliar with a task must stop work and verify how to perform the task safely.
- All personnel have the responsibility to stop anyone from performing an unsafe act or stop work if they see a safety hazard.
- Warning signals for site evacuation must be established by the SSHO and discussed during the tailgate safety meeting. A clear unobstructed entrance and exit must be maintained.
- Personnel and equipment in any contaminated area should be minimized.
- Work areas for various operational activities will be established, defined and discussed during the tailgate safety meeting.
- Procedures for leaving a contaminated area will be planned and implemented during the daily tailgate safety meeting. Work areas and decontamination procedures will be established based on expected tasks to be performed.
- Daily and ongoing inspections of site operations will be conducted by the SSHO to check compliance with this HASP. If changes in operations are necessary, the HASP must be modified to reflect these changes.
- All hand and power tools will be inspected prior to use and removed from the work area when no longer needed.
- Fire prevention and protection (appropriate signs for flammable liquids, smoking areas, storage areas of combustible or flammable materials, etc.) will be according to Atlas H&S Policy No. 19 – Fire Protection.
- Site tailgate safety meetings will be held daily to discuss anticipated site conditions and daily activities. This meeting will be summarized on the Tailgate Safety Meeting Form, see Appendix C.
- A GFCI will be used on any extension cord or plugged in item.

9.0 CONTINGENCY PLAN

There are numerous potential emergency situations that may occur while working on this project site. If an emergency does occur, it is important that employees stop work and as soon as reasonably possible contact the PM. All emergency procedures including location of stop switches, emergency equipment and muster location must be discussed during the tailgate safety meeting and with all visitors.

9.1. Medical Emergencies

The name, address, telephone number, travel distance, and travel time to the nearest medical treatment facility are found in the Emergency Information section of this HASP. A map and direction for locating the facility is also available in the Emergency Information section.

An emergency first-aid kit will be readily accessible and identified on the site, and personnel will have CPR and first-aid training. Location of the first aid kit will be identified and discussed during the daily tailgate meeting. The first-aid kit will contain equipment necessary to protect employees against exposure to bloodborne pathogens. All employees must receive bloodborne pathogens training and if requested could receive Hepatitis B vaccinations according to the Atlas H&S Policy No. 15 – Bloodborne Pathogens if exposed to bodily fluids.

Any person who becomes ill or injured in the exclusion zone must be decontaminated as well as possible with consideration to which risk will be greater, the spread of contamination or the health

of the individual. If the injury or illness is minor, full decontamination should be completed and first-aid administered before transport. If the patient's condition is serious, at least partial decontamination should be completed.

The following steps should be followed if an injury or illness case occurs regardless of severity of the injury:

- Check the area to make sure the scene is safe.
- Assess the employee's condition and if life threatening or if your training dictates call 911.
  - If 911 is called, Core Health should be contacted after talking with 911.
  - Emergency personnel must be informed if potential chemical contamination is suspected. If possible, initiate decontamination procedures to prevent contamination of responding personnel.
- Call Core Health, if the injury is not life threatening for first aid guidance.
  - A fellow employee may call for the injured employee.
  - Provide your name, Office and phone number.
  - If provided with first aid advice from Core Health, employees are authorized to secure (go to Walgreens, CVS, etc.) the items recommended by the nurse to treat the injury.
  - It is important for the injured employee to follow the advice of the nurse even when not at work (evenings, weekends).
- Begin providing first-aid using universal precautions while using proper PPE.
- If Core Health directs the injured employee to an occupational clinic for evaluation have a fellow employee drive them.
  - If someone is not available to transport the injured employee to the clinic, please let Core Health know. Based on the injury the injured employee may be able to drive themselves, but only after speaking with Core Health.
- Contact the PM as soon as it can be done safely or once the situation is stable.
  - If you cannot reach your manager, call the Office Manager or Branch Safety Officer.
  - Provide a detailed description of what and how the injury occurred. A fellow employee may make this call also.
- Complete and submit a written account of the injury within 24 hours to the Atlas incident reporting system.

9.2. Emergency Equipment

1. Eyewash containers or equipment will be available onsite.
2. First Aid Kit
3. An emergency spill cleanup kit will be available at the site at all times. Unplanned releases will be reported to the SSHO and/or site Supervisor as soon as possible.
4. A multipurpose dry chemical (Class A, B, and C) fire extinguisher, rated not less than 2A:10B:C, will be maintained on the site. Atlas employees are not trained in firefighting techniques and use of a fire extinguisher should be limited to cases of small or incipient stage fires. Always ensure you have an exit before attempting to fight a fire, notification has been completed and help is on the way.

9.3. Site Evacuation Conditions

The following conditions will necessitate the cessation of field work in the area of concern, withdrawal from the work area and revisions to this HASP:

- Fires and/or explosions
- The atmospheric conditions listed in Table 4-2 of this HASP are met.
- Flammable atmosphere readings above 10 percent LEL
- Oxygen readings above 23.5 percent oxygen concentration
- Oxygen readings at or below 19.5 percent oxygen concentration
- PID readings over 50 ppm sustained for more than 5 minutes

9.4. Gas Line, Electrical Line or Chemical Line Strike

In the event of a strike or potential strike all operations must stop and equipment turned off if safe to do so.

Onsite employees must immediately contact 911 or onsite emergency response and begin evacuation of the surrounding areas if there is no area alarm.

Once emergency services have been notified and all site personnel evacuated including the surround areas, contact the PM.

9.5. Non-Atlas Emergencies

In the event that an emergency occurs onsite that was not caused by project work, but may affect the safety of onsite staff all work must stop. If safe to do so, the site should be secured and employees moved to a safe location.

These events may include but are not limited to:

- General public medical emergency
- Vehicle incident
- Police activity – violence/theft

9.6. Emergency Communication System

Emergency contacts and telephone numbers are provided at the beginning of this HASP. Employees will be provided with a communication device for onsite and offsite communications. These devices may include radios or mobile telephones. If an emergency occurs on-site, the site supervisor is responsible for checking that the appropriate emergency contact has been notified. At the time of the emergency response, the site supervisor or designee will brief the emergency personnel on the status of the emergency, including site conditions.

Field personnel may need to use hand signals if there are noisy working conditions on the site. Any use of hand signals should be discussed during the tailgate safety meeting.

9.7. Emergency Response Follow-Up

If there is an incident or emergency response, the SSHO will notify the PM and RSC. The PM or BSO must complete an Incident Report through the company's Incident Management System. Prior to resuming work, a site safety meeting will be held to discuss the circumstances surrounding the incident and what should be done to prevent a re-occurrence.

10.0 TRAINING

It is the responsibility of the PM and each subcontractor's supervising manager to determine if Atlas and subcontractor employees meet these training requirements.

10.1. General Training Requirements

All Atlas and subcontractor employees working on this project site will have received, at a minimum, the following training prior to arrival.

- PPE use
- All tools and equipment to be used by the employee
- Hazard Communication
- Proper housekeeping
- Slip, trip and fall prevention
- Fire extinguisher training
- Temperature – Heat and Cold injuries/illnesses
- Safe lifting
- Noise
- CPR/First Aid

10.2. Hazwoper

All Atlas and subcontractor employees that work in the project exclusion zone, decontamination area or may be exposed to onsite contaminates must have completed the 40-hour training requirement of 29 CFR 1910.120(e) (Hazwoper) and maintain that training by completing an annual 8 hour Hazwoper refresher training.

10.3. Site Supervisor's Training

Onsite supervisors on this project who are directly responsible for or who supervise workers must complete, in addition to the initial 40-hour Hazwoper training, 8 additional hours of specialized supervisory training in compliance with the OSHA regulations.

10.4. Site Safety Training and Briefing Topics

The SSHO will conduct site-specific health and safety briefing (tailgate safety meeting) for field personnel before the start of all field work. All site workers including the site supervisor, Atlas employees and subcontractor personnel must attend. At the conclusion of the meeting, personnel are to sign the HASP Agreement and Acknowledgement Form and Tailgate Safety Meeting Form found in Appendix C.

As additional people are assigned to the site, it is the responsibility of the SSHO to ensure that new personnel are briefed on health and safety protocols and ensure that they have reviewed and signed the HASP Agreement and Acknowledgement Form.

The Tailgate Safety Meeting will cover:

- Site-specific health and safety procedures
- Client-specific health and safety policies and procedures
- Incidents and reporting
- JSA for tasks to be performed
- Health effects of various chemicals used on the site

- Emergency response actions pertaining to operations on-site
- Contents of this HASP

Additionally, daily site tailgate safety meetings will review past activities, plan the day's tasks, understand any near-miss and "lessons learned", establish safe working procedures for anticipated hazards and provide pertinent safety and health training and motivation.

10.5. Visitors

All visitors entering the designated work zones will be subject to all applicable health and safety requirements during field operations at this site. All visitors to a work site will be given the opportunity to review the HASP, will be escorted at all times, and will be required to stay a safe distance from site activities. The site supervisor and/or the SSHO will be responsible for briefing all visitors on the site hazards, site safety precautions, and the site emergency response plan.

APPENDIX A

Job Safety Analyses (JSA)

JOB SAFETY ANALYSIS (JSA)

DESCRIPTION OF JOB:	REVISION DATE:	JSA CREATED ON:	PAGE:
Excavating contaminated soil	11/3/2020	2/10/2005	1 of 5

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT			
☒ REFLECTIVE VEST	☐ LONG PANTS	☐ AIR PURIFYING RESPIRATOR:	☐ OTHER:
☒ HARD HAT	☒ CUT RESISTANT GLOVE LEVEL: 3	☐ SUPPLIED AIR RESPIRATOR	☐ OTHER:
☒ SAFETY TOED BOOTS	☒ IMPACT RESISTANT GLOVE LEVEL: 3	☐ CHEMICAL RESISTANT CLOTHING:	☐ OTHER:
☒ SAFETY GLASSES	☐ CHEMICAL RESISTANT GLOVE:		☐ OTHER:
☐ FACE SHIELD	☐ HEARING PROTECTION	☐ GOGGLES:	☐ OTHER:
REQUIRED TOOLS / EQUIPMENT / SUPPLIES			
☐ DRINKING WATER	☐ RATCHET WITH EXTENSION	☐ OTHER:	☐ OTHER:
☐ BUG REPELLENT	☐ WELL MAGNET	☐ OTHER:	☐ OTHER:
☒ TRAFFIC CONTROL DEVICES	☒ AIR MONITORING: PID	☐ OTHER:	☐ OTHER:
☐ LADDER	☐ LOCKOUT/TAGOUT EQUIPMENT	☐ OTHER:	☐ OTHER:

STOP WORK

Atlas and Subcontractor employees must stop work and contact off-site senior personnel when a change in condition, process, or job phase develops on the project site that is not addressed by this JSA or within the project specific HASP. The JSA should be modified with new steps, hazards, and safe procedures agreed upon by all Atlas and Subcontractor employees at the project site and approved by off-site senior personnel. Documentation of the modification and review by all affected personnel must take place.

1) JOB STEPS	2) POTENTIAL HAZARDOUS CONDITIONS / UNSAFE PRACTICES	3) SAFE PROCEDURES and PREVENTATIVE MEASURES
Entering/Exiting excavator	• Falls	• Face the surface of the equipment and use the manufacturer's designed hand and foot holds to climb in and out of the cab of the equipment using three points of contact. • Set park brake, turn equipment off, and lock controls before leaving the equipment • Always maintain three points of contacting when climbing in or out of the equipment. • Never jump off the equipment.
Moving excavator	• Co-workers, contact with pedestrian	• Use mirrors to watch for people. • Only approach the equipment after the operator has removed their hand from the control and indicated that it is safe to approach. • Do not operate the machine while pedestrians or employees are in the swing radius of the excavation arm. • Stay alert and use a spotter. • All employees must wear a high visibility traffic vest.
	• Non-Essential (unauthorized personnel)	• Establish an adequate work zone. • Minimize entry of all non-essential (unauthorized personnel) into the work zone.

JOB SAFETY ANALYSIS (JSA)

DESCRIPTION OF JOB:	REVISION DATE:	JSA CREATED ON:	PAGE:
Excavating contaminated soil	11/3/2020	2/10/2005	2 of 5

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT		
	• Vehicles	• Use mirrors to watch for traffic. • Do not operate machine while traffic is passing. • Use a spotter.
Remove contaminated soil	• Striking under ground utilities • Unidentified utilities	• Prior to digging the State's one call service must be contacted at least 48 hours before start of operations. • A private locating company should be used to identify any on-site underground utilities. • A valid ticket must be obtained and within dates. • Review as built drawings of the area. • Use a spotter to help identify any areas that appear to have back fill. • Stop if pea gravel or back fill is encountered! • Use a scrapping motion by digging 3 – 4 inches at a time for the first 5 feet.
	• Overhead hazards	• Spotter must be used when the equipment is operating or moved. Identify all overhead utilities or structures before moving equipment into position. • Must maintain a minimum of 10 feet from all overhead utility lines.
	• Contact with hazardous material	• Wear nitrile gloves under leather, cotton, or craftsman gloves. • Wear safety glasses
	• Hazardous atmosphere	• Monitor the environment for hazardous and explosive environments with a PID, FID or 4 gas monitor. • Stop work if 10 PPM is reached in the breathing zone and sustained for 5 minutes.
	• Falls into excavation	• All personnel should maintain a distance of 2 feet from the edge of the excavation. • Setup an exclusion zone around the excavation 3 feet from the edge.
	• Excavation collapse	• Competent Person for excavations must be on site to evaluate soil type. No one can enter the excavation until the Competent Person approves and performs a documented inspection. • Sloping, benching, or shoring must be used if the

JOB SAFETY ANALYSIS (JSA)

DESCRIPTION OF JOB:	REVISION DATE:	JSA CREATED ON:	PAGE:
Excavating contaminated soil	11/3/2020	2/10/2005	3 of 5

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT		
		Competent Person directs it or if the excavation exceeds 5 feet or more. • There should be no standing water in the excavation. • Limit the amount of time someone must be in an excavation. • Ladders or a means of safely climbing in and out of the excavation must used if the excavation is greater than 4 feet and place every 25 feet. The competent person may require ladders or another means of ingress and egress at depths less than 4 feet. • Spoil piles should be kept at least 2 feet from the edge of the excavation. • Daily inspections of the excavation must be conducted by the Competent Person. • Heavy equipment is not allowed any closer than 2 feet from the edge of the excavation.
Remove contaminated soil.	• Equipment tipping over	• Only qualified operators are allowed to operate the equipment. • The operator should always check the of operation before moving the equipment grade, elevation change, and weak ground conditions. • Operate the equipment from operator seat only. • Seat belt must be worn at all times when ever in the cab of the equipment. • The operator should know and respect the safe limits of the equipment. Use caution when operating on inclines. • Do not undermine machine • Move machine slowly over rough terrain. • Stay back from steep slopes and soft shoulders. • The equipment should remain at least two feet from the edge of the excavation. • A spotter should be used at all times while the equipment is in operation.
	Equipment Failure	• Perform and document daily inspection of all cabling, hydraulics, motors, fluid levels and hoses. • Replace any hoses or connections that appear to be

JOB SAFETY ANALYSIS (JSA)

DESCRIPTION OF JOB:	REVISION DATE:	JSA CREATED ON:	PAGE:
Excavating contaminated soil	11/3/2020	2/10/2005	4 of 5

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT		
		weak or leaking.
	Blowing dust	• Water should be used to wet the soil and keep dust down. • The site safety officer should evaluate the weather conditions to determine if the windy conditions warrant stopping work. • Wear goggles during windy, dusty conditions.

STOP WORK

Atlas and Subcontractor employees must stop work and contact off-site senior personnel when a change in condition, process, or job phase develops on the project site that is not addressed by this JSA or within the project specific HASP. The JSA should be modified with new steps, hazards, and safe procedures agreed upon by all Atlas and Subcontractor employees at the project site and approved by off-site senior personnel. Documentation of the modification and review by all affected personnel must take place.

Please explain additional steps, changes or amendments to this JSA in the provided space below. Prior to starting work ensure that all employees understand and agree with the changes in this JSA.

By signing this JSA form, you are acknowledging that you have read, reviewed and understand the job steps, potential hazardous conditions and unsafe conditions and the safe procedures, preventative measures required to perform the task safely and the requirement to Stop Work when a change in condition, process, or job phase develops on the project site that is not addressed by this JSA or within the project specific HASP.

Print Name	Signature	Company	Date

JOB SAFETY ANALYSIS (JSA)

DESCRIPTION OF JOB:	REVISION DATE:	JSA CREATED ON:	PAGE:
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JOB SAFETY ANALYSIS (JSA)

DESCRIPTION OF JOB:	REVISION DATE:	JSA CREATED ON:	PAGE:
Excavation or Trenching Activity	8/31/2020	04/16/2020	1 of 4

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT			
☒ REFLECTIVE VEST	☒ LONG PANTS	☐ AIR PURIFYING RESPIRATOR:	☐ OTHER:
☒ HARD HAT	☒ CUT RESISTANT GLOVE LEVEL: 3	☐ SUPPLIED AIR RESPIRATOR	☐ OTHER:
☒ SAFETY TOED BOOTS	☐ IMPACT RESISTANT GLOVE LEVEL:	☐ CHEMICAL RESISTANT CLOTHING:	☐ OTHER:
☒ SAFETY GLASSES	☐ CHEMICAL RESISTANT GLOVE:		☐ OTHER:
☐ FACE SHIELD	☒ HEARING PROTECTION	☐ GOGGLES:	☐ OTHER:
REQUIRED TOOLS / EQUIPMENT / SUPPLIES			
☐ DRINKING WATER	☐ RATCHET WITH EXTENSION	☐ OTHER:	☐ OTHER:
☐ BUG REPELLENT	☐ WELL MAGNET	☐ OTHER:	☐ OTHER:
☒ TRAFFIC CONTROL DEVICES	☐ AIR MONITORING: **Choose an item.**	☐ OTHER:	☐ OTHER:
☐ LADDER	☐ LOCKOUT/TAGOUT EQUIPMENT	☐ OTHER:	☐ OTHER:

STOP WORK

Atlas and Subcontractor employees must stop work and contact off-site senior personnel when a change in condition, process, or job phase develops on the project site that is not addressed by this JSA or within the project specific HASP. The JSA should be modified with new steps, hazards, and safe procedures agreed upon by all Atlas and Subcontractor employees at the project site and approved by off-site senior personnel. Documentation of the modification and review by all affected personnel must take place.

1) JOB STEPS	2) POTENTIAL HAZARDOUS CONDITIONS / UNSAFE PRACTICES	3) SAFE PROCEDURES and PREVENTATIVE MEASURES
Transportation of Heavy Equipment to and from the project Site	• See JSA Driving	• See JSA Driving
Unload Heavy Equipment	• See JSA Unloading Heavy Equipment	• See JSA Unloading Heavy Equipment
Moving Heavy Equipment at the Project Site	• Pedestrians/Vehicles	• Onsite personnel should wear traffic reflective vest. • Spotters must be used whenever the equipment is being operated. • Backup alarm is required on heavy equipment.
	• Tipping Over	• Only qualified operators on equipment. • Check area of operation before moving machine. • No riders on equipment or in bucket. • Lower bucket and lock controls before leaving machine. • Operate machine from operator seat only. • Know safe limits of machine. • Wear seat belt. • Use caution when operating on inclines. • Do not undermine machine.

JOB SAFETY ANALYSIS (JSA)

DESCRIPTION OF JOB:	REVISION DATE:	JSA CREATED ON:	PAGE:
Excavation or Trenching Activity	8/31/2020	04/16/2020	2 of 4

		• Move machine slowly over rough terrain • Do not move heavy loads to outer limits of machine • Stay back from steep slopes and soft shoulders
	• Overhead Hazards	• Spotter must be used whenever moving heavy equipment onsite. • Driver and spotter should walk the travel path and discuss the movement of the equipment.
Moving Heavy Equipment at the Project Site.	• Heavy Equipment	• Spotters must be used at all times when heavy equipment is being operated. • All onsite personnel must wear safety reflective vest. • Operator must follow spotters hand signals and remove hands from controls when not working. • Site personnel should only approach the spotter • Backup alarm is required on heavy equipment.
Remove Soil	• Slips, Trips, Falls	• Maintain housekeeping. • Set up work zone with enough room for staging of equipment and supplies such that there are aisle ways for walking and working. • If on pavement or concrete sweep up loose sand, dirt or rock • Wear slip resistant steel toed boots. • Keep foot wear clean of mud and other debris. • Setup areas away from snow and ice. • If ice is present wear yak-traks on boots.
Remove Soil	• Pedestrians	• Caution tape or snow fence should be used to surround the entire site. • Onsite personnel must wear traffic reflective vest. • Never lift, swing, or move load over anyone or equipment • Keep windows clean • Keep ground personnel in view
	• Entrapment	• Competent Person must be on site to evaluate soil type and document inspection (daily) of safe entry. • No one can enter the trench until the competent person approves. • Sloping, benching or shoring must be used if the Competent Person directs it or if the trench exceeds 5 feet or more.

JOB SAFETY ANALYSIS (JSA)

DESCRIPTION OF JOB:	REVISION DATE:	JSA CREATED ON:	PAGE:
Excavation or Trenching Activity	8/31/2020	04/16/2020	3 of 4

		• There should be no standing water in the trench. • Limit the amount of time someone must be in a trench. • Ladders or a means of safely climbing in and out of the trench must used if the trench is greater than 4 feet and place every 25 feet. The competent person may require ladders or another means at depths less than 4 feet. • Spoil piles should be kept at least 2 feet from the edge of the trench. • Heavy equipment not allowed any closer than 2 feet from the edge of the trench.
Remove Soil	• Noise	• Hearing protection is required in the exclusion zone when heavy equipment is in use.
	• Underground Utilities	• The State's One Call Service should be contacted at least 2 days prior to the start of the project. • A private locator is required and Atlas staff should be onsite while private locator is working. • For the first five (5) feet the equipment operator shall use a technique of scraping the ground to a depth of not more than 3 inches at a time. This technique allows the equipment operator to "feel" the presence of an unmarked utility line. • A spotter must be used to help visually identify utility lines. • If pea gravel, fill material, or refusal is encountered stop operations and report the incident to the Project Manager and Branch Safety Officer. • Hand digging within 18 inches of marked utility lines is required.
Remove Soil	• Overhead Utilities	• All over head utilities must be identified before work begins. • There should be at least 10 feet distance between the heavy equipment and the utility line. • See HASP for more information on clearance.
	• See JSA Loading Soil with End Loader	• See JSA Loading Soil with End Loader
Loading Soil for Removal	• See JSA for Soil Removal	• See JSA for Soil Removal.

JOB SAFETY ANALYSIS (JSA)

DESCRIPTION OF JOB:	REVISION DATE:	JSA CREATED ON:	PAGE:
Excavation or Trenching Activity	8/31/2020	04/16/2020	4 of 4

STOP WORK

Atlas and Subcontractor employees must stop work and contact off-site senior personnel when a change in condition, process, or job phase develops on the project site that is not addressed by this JSA or within the project specific HASP. The JSA should be modified with new steps, hazards, and safe procedures agreed upon by all Atlas and Subcontractor employees at the project site and approved by off-site senior personnel. Documentation of the modification and review by all affected personnel must take place.

Please explain additional steps, changes or amendments to this JSA in the provided space below. Prior to starting work ensure that all employees understand and agree with the changes in this JSA.

By signing this JSA form, you are acknowledging that you have read, reviewed and understand the job steps, potential hazardous conditions and unsafe conditions and the safe procedures, preventative measures required to perform the task safely and the requirement to Stop Work when a change in condition, process, or job phase develops on the project site that is not addressed by this JSA or within the project specific HASP.

Print Name	Signature	Company	Date

APPENDIX B

Chemical Hazard Information

Safety Data Sheets (SDS)

SAFETY DATA SHEET

Creation Date 10-Dec-2009 **Revision Date** 23-Jan-2018 **Revision Number** 5

1. Identification

Product Name **Tetrachloroethylene**

Cat No. : **AC445690000; ACR445690010; AC445690025; AC445691000**

CAS-No 127-18-4
Synonyms Perchloroethylene

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company

Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Skin Sensitization	Category 1
Carcinogenicity	Category 1B
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Kidney, Liver, Blood.	

Label Elements

Signal Word
Danger

Hazard Statements

Causes skin irritation
Causes serious eye irritation
May cause an allergic skin reaction
May cause drowsiness or dizziness
May cause cancer
May cause damage to organs through prolonged or repeated exposure

Precautionary Statements
Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Contaminated work clothing should not be allowed out of the workplace
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection
Response
IF exposed or concerned: Get medical attention/advice
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Skin
IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation or rash occurs: Get medical advice/attention
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Toxic to aquatic life with long lasting effects
WARNING. Cancer - https://www.p65warnings.ca.gov/.

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Tetrachloroethylene	127-18-4	>95

4. First-aid measures

General Advice If symptoms persist, call a physician.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists,

call a physician.

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects None reasonably foreseeable. May cause allergic skin reaction. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam.

Unsuitable Extinguishing Media No information available

Flash Point No information available
Method - No information available

Autoignition Temperature No information available
Explosion Limits
Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Thermal decomposition can lead to release of irritating gases and vapors. Containers may explode when heated.

Hazardous Combustion Products
Chlorine. Phosgene. Hydrogen chloride gas.
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	0	0	N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment as required. Ensure adequate ventilation.
Environmental Precautions Do not flush into surface water or sanitary sewer system.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Ensure adequate ventilation. Avoid ingestion and inhalation.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from sunlight.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Tetrachloroethylene	TWA: 25 ppm STEL: 100 ppm	(Vacated) TWA: 25 ppm (Vacated) TWA: 170 mg/m³ Ceiling: 200 ppm TWA: 100 ppm	IDLH: 150 ppm	TWA: 25 ppm STEL: 100 ppm

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: NIOSH - National Institute for Occupational Safety and Health

Engineering Measures Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Characteristic, sweet
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-22 °C / -7.6 °F
Boiling Point/Range	120 - 122 °C / 248 - 251.6 °F @ 760 mmHg
Flash Point	No information available
Evaporation Rate	6.0 (Ether = 1.0)
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	18 mbar @ 20 °C
Vapor Density	No information available
Density	1.619
Specific Gravity	1.625
Solubility	0.15 g/L water (20°C)
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	> 150°C
Viscosity	0.89 mPa s at 20 °C
Molecular Formula	C2 Cl4
Molecular Weight	165.83

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products. Excess heat. Exposure to moist air or water.

Incompatible Materials Strong acids, Strong oxidizing agents, Strong bases, Metals, Zinc, Amines, Aluminium

Hazardous Decomposition Products Chlorine, Phosgene, Hydrogen chloride gas

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Tetrachloroethylene	LD50 = 2629 mg/kg (Rat)	LD50 > 10000 mg/kg (Rat)	LC50 = 27.8 mg/L (Rat) 4 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Tetrachloroethylene	127-18-4	Group 2A	Reasonably Anticipated	A3	X	A3

IARC (International Agency for Research on Cancer)

NTP: (National Toxicity Program)

ACGIH: (American Conference of Governmental Industrial Hygienists)

Mexico - Occupational Exposure Limits - Carcinogens

IARC (International Agency for Research on Cancer)
Group 1 - Carcinogenic to Humans
Group 2A - Probably Carcinogenic to Humans
Group 2B - Possibly Carcinogenic to Humans
NTP: (National Toxicity Program)
Known - Known Carcinogen
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen
ACGIH: (American Conference of Governmental Industrial Hygienists)
A1 - Known Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Animal Carcinogen
Mexico - Occupational Exposure Limits - Carcinogens
A1 - Confirmed Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Confirmed Animal Carcinogen
A4 - Not Classifiable as a Human Carcinogen
A5 - Not Suspected as a Human Carcinogen

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Central nervous system (CNS)

STOT - repeated exposure Kidney Liver Blood

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Endocrine Disruptor Information

Component	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Tetrachloroethylene	Group II Chemical	Not applicable	Not applicable

Other Adverse Effects Tumorigenic effects have been reported in experimental animals.

12. Ecological information

Ecotoxicity

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Tetrachloroethylene	EC50: > 500 mg/L, 96h (Pseudokirchneriella subcapitata)	LC50: 4.73 - 5.27 mg/L, 96h flow-through (Oncorhynchus mykiss) LC50: 11.0 - 15.0 mg/L, 96h static (Lepomis macrochirus) LC50: 8.6 - 13.5 mg/L, 96h static (Pimephales promelas) LC50: 12.4 - 14.4 mg/L, 96h flow-through (Pimephales promelas)	EC50 = 100 mg/L 24 h EC50 = 112 mg/L 24 h EC50 = 120.0 mg/L 30 min	EC50: 6.1 - 9.0 mg/L, 48h Static (Daphnia magna)

Persistence and Degradability Insoluble in water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility . Is not likely mobile in the environment due its low water solubility. Will likely be mobile in the environment due to its volatility.

Component	log Pow
Tetrachloroethylene	2.88

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Tetrachloroethylene - 127-18-4	U210	-

14. Transport information

DOT

UN-No UN1897
Proper Shipping Name TETRACHLOROETHYLENE
Hazard Class 6.1
Packing Group III

TDG

UN-No UN1897

Proper Shipping Name TETRACHLOROETHYLENE
Hazard Class 6.1
Packing Group III

IATA
UN-No UN1897
Proper Shipping Name TETRACHLOROETHYLENE
Hazard Class 6.1
Packing Group III

IMDG/IMO
UN-No UN1897
Proper Shipping Name TETRACHLOROETHYLENE
Hazard Class 6.1
Packing Group III

15. Regulatory information

United States of America Inventory

Component	CAS-No	TSCA	TSCA Inventory notification - Active/Inactive	TSCA - EPA Regulatory Flags
Tetrachloroethylene	127-18-4	X	ACTIVE	-

Legend:
TSCA - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Australia (AICS), China (IECSC), Korea (ECL).

Component	CAS-No	DSL	NDSL	EINECS	PICCS	ENCS	AICS	IECSC	KECL
Tetrachloroethylene	127-18-4	X	-	204-825-9	X	X	X	X	KE-33294

U.S. Federal Regulations

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Tetrachloroethylene	127-18-4	>95	0.1

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Tetrachloroethylene	-	-	X	X

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Tetrachloroethylene	X		-

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Tetrachloroethylene	100 lb 1 lb	-

California Proposition 65 This product contains the following Proposition 65 chemicals.

Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
Tetrachloroethylene	127-18-4	Carcinogen	14 µg/day	Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Tetrachloroethylene	X	X	X	X	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant Y
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 10-Dec-2009
Revision Date 23-Jan-2018
Print Date 23-Jan-2018
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

APPENDIX C

List of Approved Amendments/Changes

HASP Acknowledgement/Agreement Form

Visitors Log

Tailgate Safety Meeting Form

Air Quality Monitoring Record

Equipment Calibration Log

THINK 12
Think Safe | Work Safe | Live Safe

HEALTH AND SAFETY PLAN (HASP)

List of Approved Amendments/Changes

Date	Name	Signature	Changes/Comments	Section Added

ATLAS

HEALTH AND SAFETY PLAN (HASP)

Acknowledgement/Agreement Form

(All Atlas, Subcontractor & Client Personnel Must Sign)

Client site Name: _____ Project site No: _____

Atlas Project No.: _____ Task No: _____

I acknowledge I have reviewed a copy of the Health and Safety Plan for this project, understand it, and agree to comply with all of its provisions. I also understand I could be prohibited by the site Health and Safety Coordinator or other Atlas personnel from working on this project for not complying with any aspect of this Health and Safety Plan:

PRINT NAME	SIGNATURE	COMPANY	DATE

THINK 12
Think Safe | Work Safe | Live Safe

Visitors Log

Client site Name: _____ **Project Site #:** _____

Atlas Project #: _____ **Task #:** _____

PRINT NAME	SIGNATURE	COMPANY	DATE

ATLAS

Tailgate Safety Meeting Form

Site Name & Number: _____

Atlas Project Number: _____

Work Being Performed: _____

Date & Time of Meeting: _____

Name of Presenter: _____

NOTE: On the initial day of the project, the Project Manager or designee should conduct a visual inspection of the project site prior to the Tailgate Safety Meeting. This inspection should include a review of project site equipment, hazards, specific job tasks, activities or operations to be performed for that day. These specific items must be covered during the Tailgate Safety Meeting. For subsequent days, any changes to the site or operations must be covered in the Tailgate Safety Meeting. In addition, "Task-Specific" Job Safety Analysis (JSA) for the tasks/activities at the project site must be integrated into the HASP and Tailgate discussions. Tailgate Meetings should be performed each day. Employees, client representatives and subcontractors must review the Tailgate Safety Meeting, be briefed on the topics and acknowledge the HSE topics by signing this form. Individuals not fluent in the English language must have the site's health safety and environmental requirements translated to them.

Itemize the Specific Topics Discussed (if more space is needed use the back of this page):

☐ Emergency Evacuation area(s) ☐ Eye Wash / First Aid Kit / Fire Extinguisher ☐ HASP Location ☐ Hospital Route

5 KEY SAFETY CONCEPTS -

☐ **How is everyone feeling?** (Get a response) **Is everyone Rested & Mentally alert?** FOCUS IS KEY to staying injury free.

☐ **Watch out for & Coach your Coworkers** (COMMUNICATE HAZARDS when recognized).

☐ **No Improvising** – Use the proper tool for the job (Stop and Discuss ANY variance with Atlas)

☐ **No Willful Unsafe Acts** – Enjoy the day, but no horseplay or anything unsafe.

☐ **Everyone has STOP WORK authority** – USE IT whenever people aren't focused, for all near-misses and hazards.

☐ PPE is required at all times within Exclusion zone (Set the example, call out non-compliance/stop work). ☐ Proper PPE? (check)

☐ 50 lbs. or awkward, get lifting help. ☐ Eating, Drinking and use of Cell Phones in Designated Area Only.

☐ Spotters Needed for Backing Equipment. ☐ We will follow the Safe Work Plan for the work and initial each page. Major changes will need official approvals through Mark Wallinga and Jenn Williams. ☐ Use 3 part communication as we work today

☐ Caution crossing street (Use crosswalks - HAZARDS ARE HIGH). ☐ Today's Weather _____, Drink Fluids!

☐ Caution dealing with public (Irate/unstable pedestrians, customers, locals. Be aware, be courteous, don't antagonize).

☐ Keep Emotions in check. Communicate, Take Breaks when stressed, pushed, tired, not focused! (5 minute break or job shut down?)

☐ Maintain Housekeeping ☐ No FOBKs (**What else? Are there other items we haven't considered?)**

☐ **Subcontractor** – Discuss scope of work, JSA, Daily Tasks (What are we doing? What are the Hazards? What could go wrong?)

☐ JSA Reviewed? ☐ Changes to task? Get approval first. Use the GO-CARD. Contact supervisor if solutions are clear.

☐ Headcount? _____ (First time employees onsite [Sign HASP, PPE check, discuss site specifics and client expectations]).

☐ Any Shared Learning? (Site's SIRs/Hazards) ☐ Equipment Inspections ☐ Communication & Focus is Key.

☐ Everyone needs to sign the following documents: HASP, JSA and Tailgate Safety Meeting Form. ☐ Recognition to employees –if you see something, say something!

❑ **Client Requirements** - By checking the box to the left, the presenter of the Tailgate Meeting acknowledges that all client-specific requirements have been completed for both Atlas and Subcontractor employees.

***List the JSAs reviewed below. *What extra hazards are present on this site on this day?**

JSA:			

**Continued on next page.*

Tailgate Safety Meeting Form (Pg. 2)

JSAs Reviewed and Modification Documentation (If modification not required please note):

***By signing this Tailgate Safety Meeting form, you are acknowledging that you have read, reviewed and understand the health and safety topics discussed on this form.**

Daily Safety Tailgate Meeting Participants (Use the back of this form if needed)			
Print Name	**Signature**	**Company**	**Date**

***Tailgate Presenter must sign below that all information above was covered with all personnel on site.**

Print Name	Signature	Company	Date

THINK 12
Think Safe | Work Safe | Live Safe

Air Quality Monitoring Record

Date	Time	Location	Instrument	Concentration (Units)	Sampled By

ATLAS

APPENDIX D

Risks Associated with Drilling and Subsurface Activities

Checklist for Subsurface Activities

Monthly Heavy Equipment Checklist

RISKS ASSOCIATED WITH DRILLING AND SUBSURFACE ACTIVITIES

Drilling operations will conform to the Job Safety Analysis and Subsurface Investigation (Atlas Policy No. 46). During drilling operations, the subsurface is penetrated to obtain soil and/or groundwater samples. Contaminated soil cuttings and groundwater may be brought to the surface, creating a potential for exposure through skin contact and inhalation of vapors. The open borehole also creates a conduit for vapors to be released to the atmosphere. However, the amount of vapors released to the atmosphere is relatively small and vapors are usually quickly diluted and dispersed in air. Air monitoring is required to determine if protective equipment is necessary, as described in Section 4.0 of this HASP.

In addition to these chemical risks, the risk of drilling into a buried utility, such as a gas, water, electric line, or underground storage tank or other structures, is always present. Complete the Checklist for Subsurface Clearance (33-01) prior to any subsurface work and follow the procedures in Table D-1 for at least the first 5 feet of penetration:

Risks of injury associated with the drilling operation itself also exist. The risks of working near overhead electrical lines may also present a safety hazard. The SSHO will check for the presence of overhead lines and other obstructions. No drilling operations will be performed within 10 feet of overhead lines with voltages 0-50 kV. For other voltages refer to Atlas Electrical Safety Policy (No. 32) and Equipment (Drill Rigs, Mobile Equipment) Policy (No. 34). Whenever possible, stay at least two feet from turning or rotating machinery which includes but is not limited to augers, catheads, engines, power take off (PTO), and drill rods. Learn where the rig kill switch is to shut the rig off in case of an emergency. A discussion should be held with the driller on each drill rig at the startup of the field work to discuss the location and use of the kill switch and for documentation of a Safety Inspection such as the Monthly Heavy Equipment Safety Inspection Checklist found in this section.

TABLE D-1: Drilling/Probing Procedures

(First 5 Feet below Surface)

Step 1: Site Walk	Conduct site walk. Verify that the Checklist for Subsurface Clearance has been fully completed.
Step 2: Locate Markouts	Locate all utility markouts and borehole locations. Start intrusive activities at least five (5) feet away and perpendicular to all marked utility lines.
Step 3: Break Surface Cover	Use a jackhammer or concrete saw to break through the asphalt or concrete surface cover. The drill bit on the rig may also be used on the asphalt cover. Do **NOT** advance bit or cutting tools beyond the asphalt or concrete cover.
Step 4: Surface Boring	Use air knife with vacuum extractors, hand auger, or hand shovel to remove soil from the borehole to a depth of at least 5 feet below surface. The soil in the borehole should be excavated to a diameter of at least three inches greater than the diameter of the drill bit on the lead auger or drill stem that is to be used. If it is not possible to perform a surface boring which meets the diameter requirements as stated above, surface borings should be installed to the required depth of 5 feet surrounding the proposed well/boring location in such a manner that any lines/utilities passing through the proposed well/boring location will be encountered while installing the investigation borings/well. If pea gravel, fill material, or refusal is encountered, and was not expected to be encountered, abandon the boring and follow instructions from item #9 of section 5.4.1.
Step 5: Soil Sampling	If soil samples are required to be collected within the first 5 feet below surface, a hand auger should be utilized to collect native, undisturbed soil samples.
Step 6: Borehole Protection	If no piping or other structures are encountered within the first 5 feet below surface, normal drill/probe activities may proceed with **caution**. Containerize drill cuttings as appropriate. If excavation of the borehole is conducted the day before actual drilling is conducted, the borehole should be covered with barricades or cones and with a sheet of material sufficient in strength to support a person's weight until it is ready to be drilled. If the borehole is of sufficient size to potentially cause damage to a vehicle if driven over, the borehole should be covered with a material sufficient in strength to support vehicular weight. In lieu of barricades or cones and a material cover, the boring may be temporarily backfilled to surface. If a backfill material is utilized, it is important for the material to be flush with the surrounding pavement.

Appendix 46-01 – Subsurface Clearance Checklist

Must be completed prior to the start of subsurface work.

Project Number: _____ **Site Address:** _____

State One Call Ticket Information:			
Ticket Number:		**Expiration Date of Ticket:**	
Request Date of Ticket:		**Today's Date:**	

Complete Prior to the Start of Work	Yes	No (Stop Work)	Initials
State One Call system contacted within state required time requirement?	☐	☐	
Have all utilities listed on one call ticket been marked onsite or indicated as "no conflict"?	☐	☐	
Is the planned subsurface work area at least 5 feet from any known or marked utility?	☐	☐	
If the subsurface work is on private property, has a private locator located the private utilities?	☐	☐	
Location of all aboveground indicators of underground utilities leading from or to above ground structures been identified and verified as being out of planned subsurface work area?	☐	☐	
Have all utility markings onsite been photograph in relation to the planned subsurface work?	☐	☐	
Has a tailgate safety meeting been held and JSA reviewed with all employees to discuss the subsurface work that will be performed, signs of underground utilities and emergency procedures?	☐	☐	

Select Bore Clearing Method:

Air Knife/Hydro Vac	Hand Auger	N/A - Geotechnical	N/A - Excavation/Trench
☐	☐	☐	☐

Subsurface Clearance Checklist Completed By:

Printed Name	Signature	Date

Monthly Mobile/Heavy Equipment Safety Inspection Checklist

This form is to be completed by the qualified operator of the equipment

Date:		**Project No.:**		**Site/Location:**	
Equipment Type:		**Model No.:**		**Odometer:**	
Operator/Inspector Name:				**Machine Hours:**	

Warning: Do not operate a malfunctioning machine until corrective measures have been taken and all discrepancies have been cleared by a qualified operator/mechanic. In addition to elements on this checklist, the owner's manual for the specific piece of equipment being operated may contain other daily inspection checks and/or preventative maintenance procedures.

General Safety	☐	Operator Qualification	☐	PPE Supplies	☐	Fire Extinguisher (ready-to-use)
	☐	Owner's Manual (present)	☐	Markers (cones, barricades, etc.)	☐	First-Aid Kit (present & stocked)
	☐	Manufacturer Specs Followed	☐	Access Ladder (secure and ok)	☐	Housekeeping (clean)
	☐	Emergency Kit (signs, flares)	☐	Flashlight	☐	
Vehicle, Engine, and Hydraulic Systems (note any added fluid)	☐	Engine Oil (fluid level, condition)	☐	Fuel Level	☐	Other Fluid
	☐	Transmission (fluid level, fluid condition, unit operation)	☐	Brake Fluid	☐	Steering (power steering fluid level, no play in steering)
	☐	Radiator (coolant level, hose condition)	☐	Fan Belts (tension/condition)	☐	Brakes (vehicle, parking)
	☐	Hydraulic System (fluid level, fluid condition, hose condition, cylinders, leakage)	☐	Chassis (proper lubrication)	☐	Tires (condition, inflation)
	☐	Outriggers (operational, if equipped)	☐		☐	
Tracked Vehicles	☐	Track Tension (proper tension)	☐	Plates and/or Shoes	☐	Grouser Plates
	☐	Rollers	☐	Drive Sprockets		
Lights and alarms (clean and functional)	☐	Headlights (hi, low, run beams)	☐	Parking Lights	☐	Revolving Flashing Lights (if required)
	☐	Reverse Lights (backup)	☐	Equipment Work Lights	☐	Horn
	☐	Brake/Tail Lights	☐	Turn Signals/Hazard Flashers	☐	Reverse Alarms (backup)
Vehicle cab (clean and functional)	☐	Seatbelts (if required)	☐	Windshield Wipers	☐	Body Damage
	☐	Housekeeping	☐	2 Way Communication	☐	Speed/Hour Meter
	☐	Fuel Gauge	☐	Horn (operational)	☐	Windshield (glass ok, clean)
	☐	Controls Operational	☐	Mirrors (rear view, side)		

Maintenance/ Equipment Request	Corrected By:	Date:

Inspector Signature:		**Date:**	

Excavating and Trenching

All Atlas employees and subcontractors must be trained and be familiar with the OSHA Excavation Standard and the Atlas Employee Health and Safety Policy Manual, Policy No. 16 (Excavation and Trenching) and Policy No. 46 (Subsurface Investigation).

Underground Utilities

Prior to any work beginning, the estimated location of utility installations (such as sewer, telephone, fuel, electric, water lines, or any other underground installation) that reasonably may be expected to be encountered during excavation work must be determined prior to opening an excavation. Utility companies or owners will be contacted and advised of the proposed work and asked to establish the location of the utility underground installations. When utility companies or owners cannot respond to a request to locate underground utilities within 24-48 hours (unless a longer period is required by State or local law), or cannot establish the exact location of these installations, the work may proceed, provided that the work is conducted with caution, and provided detection equipment or other acceptable means to located utilities are used.

When excavation operations approach the estimated location of underground installations

APPENDIX E

Excavating & Trenching

(approximately 18 inches from the installation), the exact location of the installations will be determined by a safe and acceptable means. While the excavation is open, underground installations will be protected, supported, or removed to safeguard employees.

Entering Excavations or Trenches

Daily inspections of excavations, the adjacent areas, and protective systems will be made by a "*Competent Person"* for evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection will be conducted by the Competent Person prior to the start of work and as needed throughout the shift. Inspections will also be made after every rainstorm or other hazard increasing occurrence. All inspections made by the Competent Person should be recorded in the field log book.

No person(s) will perform work in a trench or excavation that contains accumulated water.

9.1.1. Access/Egress

A stairway, ladder, ramp, or other safe means of egress will be located in trench excavations that are 4 feet or more in depth so as to require no more than 25 feet of lateral travel distance in any direction.

9.1.2. Exposure to Falling Loads

No employee or subcontractor is permitted underneath loads handled by lifting or digging equipment. All personnel are required to stand away from any vehicle being loaded or unloaded to avoid being struck by spilling or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the equipment is provided with a cab shield and/or canopy adequate to protect the operator from falling materials.

9.1.3. Warning Systems

When mobile equipment is operated adjacent to an excavation and the operators/drivers do not have a clear and direct view of the edge of the excavation, a warning system such as barricades, hand or mechanical signals, or stop logs are required.

9.1.4. Protection from Loose Rock or Soil

Adequate protection will be provided to protect employees from loose rock or soil that could pose a hazard to personnel in the excavation. All temporary spoil piles will be kept at least 2 feet away from the edge of the excavation. Spoil piles should be placed to channel rainwater or other run-off water away from the excavation.

9.1.5. Hazardous Atmospheres

All excavations deeper than 4 feet deep and which have the potential to have a hazardous atmosphere or oxygen deficient atmospheres (Less than 19.5% oxygen) must be tested to ensure safe working conditions, prior to entry. Air monitoring will be conducted in accordance with Section 4.0 of the HASP.

9.1.6. Protective Systems

Each employee in an excavation must be protected from cave-ins by an adequate protective system except when excavations are made entirely in stable rock or the excavation is less than 5 feet in depth and examination by the Competent Person provides no indication of a potential cave-in. Protective systems consist of sloping or benching, use of trench boxes or other shielding mechanisms, or the use of a shoring system in accordance with the regulations.

APPENDIX F

Lockout/Tagout Procedures

Appendix 33-04: Lockout Usage Log

Project Number:							
Date On:	**Date Off:**	**Authorized Employee(s)**	**Task/Reason for LOTO**	**Time On:**	**Time Off:**	**Types of Energy**	**Procedure Followed**

APPENDIX D

DESIGN DRAWINGS & SPECIFICATIONS

PLOTTED: 11/10/2021 11:34 AM

GENERAL NOTES

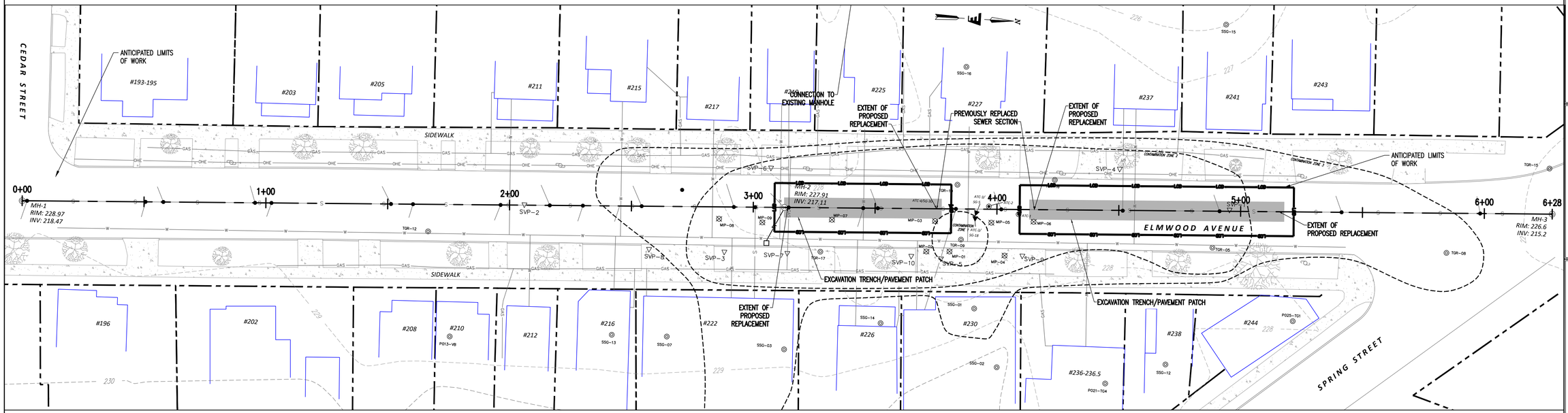
1. ALL WORK MUST COMPLY WITH DEC CORRECTIVE ACTION PLAN
2. TOPOGRAPHIC DATA AND EXISTING INFORMATION FROM ATLAS ATC.
3. PROPERTY LINES DEPICTED ARE APPROXIMATE AND BASED SOLELY ON GIS DATA.
4. UTILITIES SHOWN DO NOT PURPORT TO CONSTITUTE OR REPRESENT ALL UTILITIES LOCATED UPON OR ADJACENT TO THE SURVEYED PREMISES. EXISTING UTILITY LOCATIONS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CONFLICTS. ALL DISCREPANCIES SHALL BE REPORTED TO THE OWNER AND ENGINEER.
5. EXACT OBJECT LOCATIONS MAY DIFFER FROM THAT AS SHOWN, AND ADDITIONAL SUB-SURFACE AND SURFACE UTILITIES AND STRUCTURES MAY EXIST. THE CONTRACTOR IS TO PROCEED WITH CARE IN EXECUTING ANY WORK AND TO CALL DIG SAFE 48 HOURS PRIOR TO DIGGING, DRILLING OR BLASTING.
6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONDUCT EXPLORATORY TEST PITS AS MAY BE REQUIRED TO DETERMINE UNDERGROUND CONDITIONS IN CRITICAL AREAS.
7. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY CONDITIONS THAT VARY FROM THOSE SHOWN ON THE PLANS. THE CONTRACTOR'S WORK SHALL NOT VARY FROM THE PLANS WITHOUT THE EXPRESSED APPROVAL FROM THE ENGINEER.
8. THE CONTRACTOR SHALL RESTORE LAWNS, DRIVEWAYS, CULVERTS, SIGNS AND OTHER PUBLIC OR PRIVATE PROPERTY DAMAGED OR REMOVED TO EXISTING CONDITIONS OR BETTER AS DETERMINED BY THE ENGINEER. ANY DAMAGED TREES, SHRUBS AND/OR HEDGES SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE, UNLESS NOTED OTHERWISE. ROOTS ENCOUNTERED OR TREES NOT INTENDED FOR REMOVAL ARE TO BE NEATLY PRUNED.
9. THE CONTRACTOR SHALL COMPLY WITH ALL PERMIT REQUIREMENTS.
10. THE CITY SHALL BE RESPONSIBLE FOR OBTAINING, AND INCURRING THE COST OF ALL REQUIRED PERMITS, INSPECTIONS, AND CERTIFICATES.
11. THE CONTRACTOR SHALL PROTECT EXISTING PROPERTY LINE MONUMENTATION. ANY MONUMENTATION DISTURBED OR DESTROYED, AS JUDGED BY THE ENGINEER OR OWNER, SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE UNDER THE SUPERVISION OF A VERMONT LICENSED LAND SURVEYOR.
12. ALL TRENCH EXCAVATION AND ANY REQUIRED SHEETING AND SHORING SHALL BE DONE IN ACCORDANCE WITH THE LATEST OSHA REGULATIONS FOR CONSTRUCTION.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND THE MAINTENANCE OF SURFACE DRAINAGE DURING THE COURSE OF WORK.
14. MAINTAIN FLOW FOR ALL EXISTING UTILITIES, UNLESS NOTED OTHERWISE. THIS MAY REQUIRE BYPASS PUMPING FOR SANITARY SEWERS.
15. ALL SITE FILL SHALL MEET SELECTED FILL STANDARDS UNLESS NOTED OTHERWISE ON THE DRAWINGS.
16. CONTRACTOR TO GRADE ALL AREAS ON THE SITE TO PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDINGS AND IMPERVIOUS SURFACES.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL FIELD LAYOUT. THE CONTRACTOR SHALL PROVIDE MARKED-UP AS-BUILT PLANS FOR ALL UTILITIES SHOWING CONNECTIONS, BENDS, VALVES, LENGTHS OF LINES AND INVERTS. AS-BUILT PLANS SHALL BE REVIEWED BY THE OWNER AND HIS/HER REPRESENTATIVES BEFORE UTILITIES WILL BE ACCEPTED.

LEGEND

EXISTING FEATURES

- SEWER MANHOLE
- STORM MANHOLE
- WATER VALVE
- SEPTIC SERVICE CONNECTION
- EXISTING PROPERTY LINE
- CONTOUR
- SANITARY SEWER LINE
- STORM WATER LINE
- WATER LINE
- GAS MAIN
- OVERHEAD ELECTRIC
- LIMITS OF DISTURBANCE
- SHALLOW SOIL VAPOR ISOPLETH – PCE CONCENTRATIONS IN SHALLOW SOIL GAS – WESTON SOLUTIONS, 2018
  ZONE 1: >5,000 UG/M³
  ZONE 2: >10,000 UG/M³
  ZONE 3: >50,000 UG/M³

GRAVITY SEWER CONTEXTUAL PLAN



GRAPHIC SCALE

20 0 10 20 40 80

1 inch = 20 ft.
for sheet size 24" x 36"

Stamp

No.	Description	Date

ENGINEERING VENTURES PC
208 Flynn Avenue, Suite 2A, Burlington, VT 05401 • 802-863-6225
85 Mechanic Street, Suite E2-3, Lebanon, NH 03766 • 603-442-9333
414 Union Street, Schenectady, NY 12305 • 518-630-9614
www.engineeringventures.com

Vermont Department of Environmental Conservation
Waste Management & Prevention Division
Davis Building - 1st Floor
One National Life Drive
Montpelier, VT 05520-3704

Sheet Title: Overall Site Plan

Project Title: **Elmwood Ave Sewer Replacement**
Burlington, VT

EV Project #	21336
Drawn By:	TLB
Checked By:	PB
Scale:	As Noted
Date:	Nov 10, 2021

C2.1

S:\PROJECTS\2021\21336 ELMWOOD AVE CAP ASSISTANCE\DWG\SHEET FILES\21336 - C2.X PLAN-PROFILES.DWG

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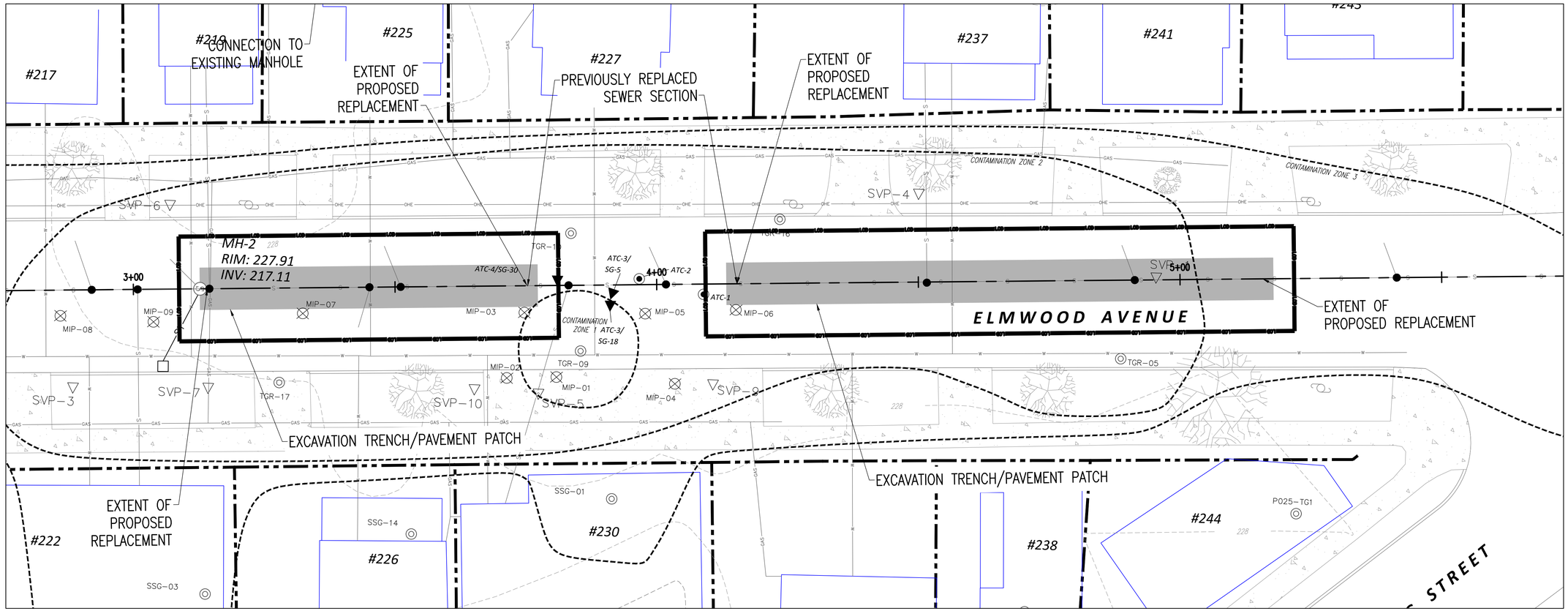

LEGEND

EXISTING FEATURES

- SEWER MANHOLE
- STORM MANHOLE
- WATER VALVE
- SEPTIC SERVICE CONNECTION
- EXISTING PROPERTY LINE
- CONTOUR
- SANITARY SEWER LINE
- STORM WATER LINE
- WATER LINE
- GAS MAIN
- OVERHEAD ELECTRIC
- CONTAMINATION ZONES

GRAPHIC SCALE

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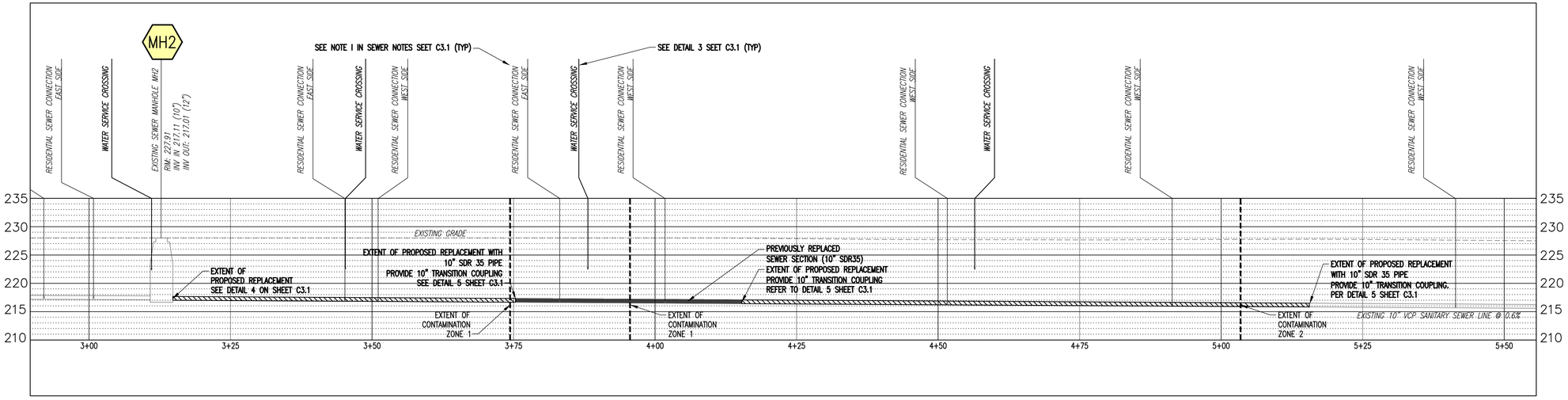
1 inch = 10 ft.
for sheet size 24" x 36"



Stamp

No.	Description	Date

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414 Union Street, Schenectady, NY 12305 • 518-630-9614
www.engineeringventures.com

Vermont Department of Environmental Conservation
Waste Management & Prevention Division
Davis Building - 1st Floor
One National Life Drive
Montpelier, VT 05620-3704

Sheet Title: Gravity Sewer Plan and Profile

Project Title: **Elmwood Ave Sewer Replacement**
Burlington, VT

EV Project #	21336
Drawn By:	TLB
Checked By:	PB
Scale:	As Noted
Date:	Nov 10, 2021

C2.2

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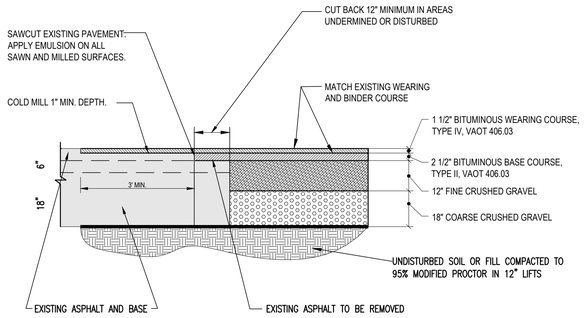

ASPHALT PAVEMENT TRENCH PATCH DETAIL

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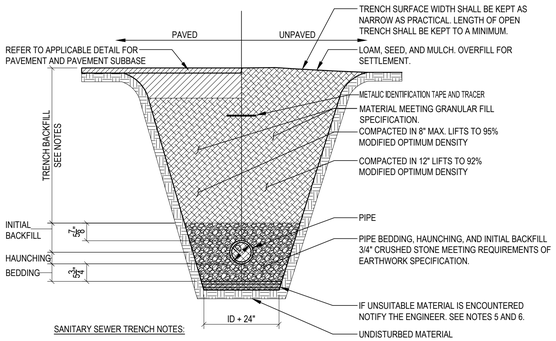
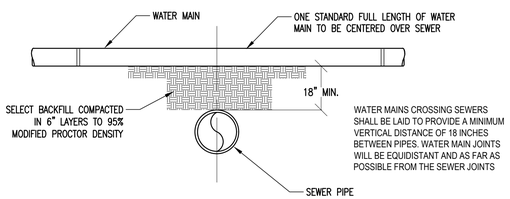


SANITARY SEWER TRENCH NOTES:

1. UNLESS OTHERWISE NOTED, ASSUME CLASS "C" SOILS. PERFORM ALL EXCAVATIONS TO OSHA REQUIREMENTS.
2. BEDDING TO PROVIDE A FIRM, STABLE, CONTINUOUS AND UNIFORM SUPPORT FOR FULL LENGTH OF PIPE.
3. FOR BUILDING SEWERS THE MINIMUM DEPTH TO THE TOP OF THE PIPE SHALL BE 4'-0". WHERE BUILDING SEWERS ARE TO BE INSTALLED AT A DEPTH LESS THAN 3'-0" UNDER DRIVEWAYS, EXTRA HEAVY CAST IRON OR OTHER HIGH STRENGTH PIPE SHALL BE USED. OTHERWISE, REFER TO INSULATION OVER SHALLOW SEWER LINE DETAIL.
4. FOR SEWER COLLECTION SYSTEMS THE MINIMUM DEPTH TO THE TOP OF THE PIPE SHALL BE 5'-0". THIS DEPTH SHALL BE INCREASED TO 6'-0" IN AREAS TO BE PLOWED DURING THE WINTER MONTHS. OTHERWISE, REFER TO INSULATION OVER SHALLOW SEWER LINE DETAIL.
5. BACKFILL SHALL BE OF A SUITABLE NATIVE MATERIAL REMOVED FROM EXCAVATION EXCEPT WHERE OTHER MATERIAL IS SPECIFIED. DEBRIS, FROZEN MATERIAL, LARGE CLODS OR STONES, ORGANIC MATTER OR OTHER UNSTABLE MATERIAL SHALL NOT BE USED FOR BACKFILL.
6. LEDGE, ROCK, BOULDERS AND LARGE STONES SHALL BE REMOVED TO PROVIDE A MINIMUM CLEARANCE OF FOUR INCHES BELOW AND ON EACH SIDE OF ALL PIPES.
7. SEWERS ON 20 PERCENT SLOPES OR GREATER SHALL BE ANCHORED SECURELY WITH CONCRETE ANCHORS OR EQUIVALENT, SPACED AS FOLLOWS:
   A. NOT OVER 36 FEET CENTER TO CENTER ON GRADES 20 PERCENT AND UP TO 35 PERCENT
   B. NOT OVER 24 FEET CENTER TO CENTER ON GRADES 35 PERCENT AND UP TO 50 PERCENT
   C. NOT OVER 16 FEET CENTER TO CENTER ON GRADES 50 PERCENT AND OVER

SANITARY SEWER TRENCH DETAIL

SCALE: NONE (2)



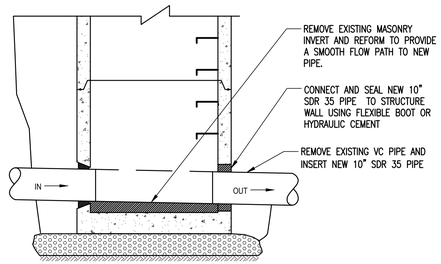
WATER MAIN ABOVE SEWER

SEPARATION NOTES:

1. WATER MAIN RELATIONS TO SEWER SHALL BE IN ACCORDANCE WITH THE "RECOMMENDED STANDARDS FOR WATER WORKS" SO-CALLED TEN STATE STANDARDS.
2. WATER MAINS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWERS. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE. IF THIS DISTANCE CANNOT BE OBTAINED, THEN THE PIPES SHALL BE INSTALLED IN A SEPARATE TRENCH AT AN ELEVATION SO THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER.
3. WHEN IT IS IMPOSSIBLE TO MAINTAIN 18" VERTICAL SEPARATION OR WHERE THE SEWER MUST BE LAID ABOVE THE WATER MAIN; 1) THE CROSSING SHALL BE ARRANGED SO THAT ONE FULL LENGTH OF SEWER IS CENTERED ABOVE OR BELOW THE WATER LINE WITH SEWER JOINTS AS FAR AS POSSIBLE FROM WATER JOINTS; 2) THE SEWER PIPE MUST BE CONSTRUCTED TO WATER MAIN STANDARDS FOR A MINIMUM DISTANCE OF 20 FEET EITHER SIDE OF THE CROSSING OR A TOTAL OF THREE PIPE LENGTHS, WHICH EVER IS GREATER; 3) THE SECTION CONSTRUCTED TO WATER MAIN STANDARDS MUST BE PRESSURE TESTED TO MAINTAIN 50 psi FOR 15 MINUTES WITHOUT LEAKAGE PRIOR TO BACKFILLING BEYOND ONE FOOT ABOVE THE PIPE TO ASSURE WATER TIGHTNESS.
4. THE CONTRACTOR SHALL COORDINATE WITH DPW WATER RESOURCES IF WATER SERVICE DISRUPTION IS REQUIRED. AN ATTEMPT SHALL BE MADE TO AVOID DISRUPTION OF SERVICE, BUT IN THE EVENT DISRUPTION IS DETERMINED TO BE NECESSARY, ADEQUATE NOTICE TO IMPACTED CUSTOMERS SHALL BE PROVIDED. 72 HOURS OF ADVANCE NOTICE IS PREFERRED AND THE INTERRUPTION SHOULD BE COORDINATED DIRECTLY WITH DPW WATER RESOURCES.

SANITARY SEWER/WATER LINE CROSSING

SCALE: NONE (3)

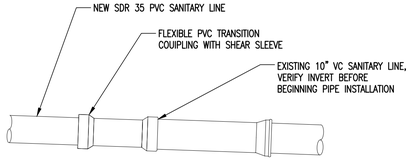


MANHOLE CONNECTION NOTES

1. CONFIRM CONDITION OF MANHOLE SIDEWALL AT CONNECTION POINT PRIOR TO BEGINNING EXCAVATION AND PIPE INSTALLATION. NOTIFY CITY DPW IF CONDITION WILL NOT ALLOW A STABLE, WATERTIGHT CONNECTION.
2. CONTRACTOR TO REMOVE DETERIORATED MASONRY AND REPAIR DAMAGED AREAS ALONG WITH CONNECTION WORK.
3. MANHOLE INVERT TO BE REMOVED TO THE EXTENT NECESSARY TO PROVIDE A FIRM BONDING SURFACE AND ALLOW FORMING OF A SMOOTH, U-SHAPED, FLOW PATH TO FULL DEPTH OF PIPE. INVERT TO BE PROTECTED FROM DAMAGE DURING CURING.
4. SEALING AROUND NEW PIPE TO BE ACCOMPLISHED USING A FLEXIBLE BOOT, HYDRAULIC CEMENT, OR ANOTHER METHOD APPROVED IN ADVANCE BY THE CITY.

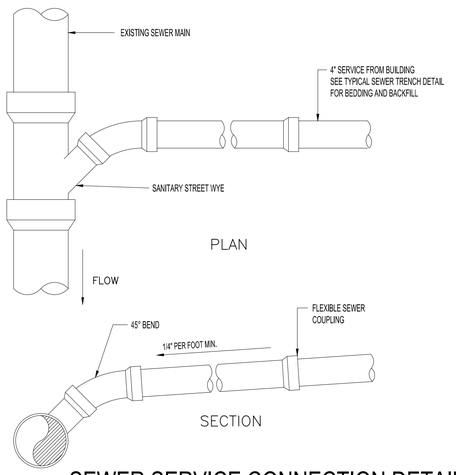
MANHOLE CONNECTION DETAIL

SCALE: NONE (4)



SEWER MAIN TRANSITION DETAIL

SCALE: NONE (5)



SEWER SERVICE CONNECTION DETAIL

SCALE: NONE (6)

SEWER NOTES

A. ALL WORK TO CONFORM WITH VERMONT DEC REQUIREMENTS.

B. CONTRACTOR TO DIG TEST PITS TO VERIFY INVERTS OF EXISTING SANITARY SEWER MAINS AT CONNECTION POINT PRIOR TO BEGINNING TO SET PIPE.

C. SEWER MAINS AND SERVICES SHALL BE CONSTRUCTED IN A MANNER WHICH WILL PREVENT LEAKING, BREAKING OR CLOGGING.

D. SLOPE, VELOCITY: ALL GRAVITY SEWER LINES SHALL BE INSTALLED TO MATCH SLOPE OF PIPE BEING REPLACED WITHOUT DIPS OR LATERAL DISPLACEMENT. MINIMUM SLOPE 0.4%.

E. CHANGES IN PIPE SIZE: WHEN A SMALLER SEWER JOINS A LARGE ONE, THE INVERT OF THE LARGER SEWER SHALL BE LOWERED SUFFICIENTLY TO MAINTAIN THE SAME ENERGY GRADIENT.

F. MATERIAL: PVC SDR 35, ASTM D3034, WITH PUSH-ON GASKETED JOINTS. GASKETS SHALL CONFORM TO ASTM D3212. SEWER JOINTS SHALL BE CONSTRUCTED TO MINIMIZE INFILTRATION AND TO PREVENT THE ENTRANCE OF ROOTS INTO THE SYSTEM.

G. TRENCHING: LEDGE, ROCK, BOULDERS , LARGE STONES, AND ABANDONED CONCRETE SHALL BE REMOVED TO PROVIDE A MINIMUM CLEARANCE OF FOUR INCHES BELOW AND ON EACH SIDE OF ALL PIPES.

H. BEDDING: SEE TRENCH DETAIL DRAWING FOR MATERIALS. TRENCH BACKFILL SHALL BE OF A SUITABLE NATIVE MATERIAL FREE FROM DEBRIS, FROZEN MATERIAL, LARGE CLODS OR STONES, ORGANIC MATTER, OR OTHER UNSTABLE MATERIALS.

I. SEWER FLOW SHALL BE ARRESTED DURING CONSTRUCTION BY PLUGGING UPSTREAM OF THE WORK AREA AND PUMPING AS NEEDED TO PREVENT BACKUP INTO HOMES AND BUSINESSES. WORK TO COMMENCE UPSTREAM TO DOWNSTREAM, PLUGGING ANY LATERAL CONNECTIONS AS ENCOUNTERED. THE CONTRACTOR SHALL COORDINATE WITH DPW WATER RESOURCES IF SEWER SERVICE DISRUPTION IS REQUIRED. AN ATTEMPT SHALL BE MADE TO AVOID DISRUPTION OF SERVICE, BUT IN THE EVENT DISRUPTION IS DETERMINED TO BE NECESSARY, ADEQUATE NOTICE TO IMPACTED CUSTOMERS SHALL BE PROVIDED. 72 HOURS OF ADVANCE NOTICE IS PREFERRED AND THE INTERRUPTION SHOULD BE COORDINATED DIRECTLY WITH DPW WATER RESOURCES.

K. INSTALLATION: PIPE SHALL BE LAID WITH BELL ENDS FACING UPGRADE AND LAYING SHALL START AT THE DOWNGRADE END.

L. WATER LINE SEPARATION

a. HORIZONTAL SEPARATION: SEWERS SHALL BE LAID FLAT AT LEAST TEN FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.

WHERE IMPOSSIBLE OR IMPRACTICABLE TO MAINTAIN THE TEN FOOT SEWER/WATER PIPE HORIZONTAL SEPARATION, (DUE TO LEDGE, BOULDERS OR OTHER UNUSUAL CONDITIONS) THE WATER LINE MAY BE IN A SEPARATE TRENCH OR ON AN EARTH SHELF IN THE SEWER TRENCH PROVIDED THAT THE BOTTOM OF THE WATER LINE IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER. WHEREVER IMPOSSIBLE OR IMPRACTICAL TO MAINTAIN THE 18 INCH VERTICAL SEPARATION, THE SEWER LINE SHALL BE CONSTRUCTED USING PRESSURE PIPE TO NORMAL WATER LINE STANDARDS AND PRESSURE TESTED TO 50 PSI FOR 15 MINUTE PRIOR TO BACKFILLING.

b. CROSSINGS: SEWERS CROSSING WATER MAINS SHALL BE LAID BENEATH THE WATER MAIN WITH AT LEAST 18 INCHES VERTICAL CLEARANCE BETWEEN THE OUTSIDE OF THE SEWER AND THE OUTSIDE OF THE WATER MAIN. WHEN IT IS IMPOSSIBLE TO MAINTAIN THE 18 INCH VERTICAL SEPARATION;

- THE CROSSING SHALL BE ARRANGED SO THAT ONE FULL LENGTH OF SEWER IS CENTERED ABOVE OR BELOW THE WATER LINE WITH SEWER JOINTS AS FAR AWAY AS POSSIBLE FROM WATER JOINTS;
- THE SEWER PIPE MUST BE CONSTRUCTED TO WATER MAIN STANDARDS FOR A MINIMUM DISTANCE OF 20 FEET EITHER SIDE OF THE CROSSING OR A TOTAL OF THREE PIPE LENGTHS, WHICHEVER IS GREATER;
- THE SECTION CONSTRUCTED TO WATER MAIN STANDARDS MUST BE PRESSURE TESTED TO MAINTAIN 50 PSI FOR 15 MINUTES WITHOUT LEAKAGE PRIOR TO BACKFILLING BEYOND ONE FOOT ABOVE THE PIPE TO ASSURE WATER TIGHTNESS;
- WHERE A WATER MAIN CROSSES UNDER A SEWER, ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO PREVENT DAMAGE TO THE WATER MAIN.

M. LEAKAGE TESTS: UPON COMPLETION OF SEWER LINE CONSTRUCTION, THE SEWER LINE SHALL BE TESTED IN ACCORDANCE WITH VERMONT DEC REQUIREMENTS:

1. WHEN THE PRESSURE HAS STABILIZED AND IS AT OR ABOVE THE STARTING TEST PRESSURE OF 3.5 PSI ABOVE THE PIPE, START THE TEST. IF THE PRESSURE DROPS MORE THAN 1.0 PSI DURING THE TEST TIME, THE LINE IS PRESUMED TO HAVE FAILED THE TEST. IF A 1.0 PSI DROP DOES NOT OCCUR WITHIN THE TEST TIME, THE LINE HAS PASSED THE TEST. THE TEST TIME SHALL BE DERIVED FROM THE FOLLOWING TABLE. IF THE SECTION OF LINE TO BE TESTED INCLUDES MORE THAN ONE PIPE SIZE, CALCULATE THE TEST TIME FOR EACH SIZE AND ADD THE TEST TIMES TO ARRIVE AT THE TOTAL TEST TIME FOR THE SECTION.

PIPE SIZE (IN)	T (TIME) (MIN./100FT)
3	0.2
4	0.3
6	0.7
8	1.2

Stamp

No.	Description	Date

ENGINEERING VENTURES PC
208 Flynn Avenue, Suite 2A, Burlington, VT 05401 • 802-863-6225
85 Mechanic Street, Suite E2-3, Lebanon, NH 03766 • 603-442-9333
414 Union Street, Schenectady, NY 12305 • 518-630-9614
www.engineeringventures.com

Vermont Department of Environmental Conservation
Waste Management & Prevention Division
Davis Building - 1st Floor
One National Life Drive
Montpelier, VT 05620-3704

Sheet Title: Site and Sewer Details

Project Title: **Elmwood Ave Sewer Replacement**
Burlington, VT

EV Project #	21336
Drawn By:	TLB
Checked By:	PB
Scale:	As Noted
Date:	Nov 10, 2021

C3.1

APPENDIX E

CITY OF BURLINGTON CONSTRUCTION INSPECTION SERVICES REQUIREMENTS

SCOPE OF WORK
The consultant hired to perform these services should be qualified to perform a variety of inspection, record keeping and construction engineering activities including, but not limited to:

Task 1: Administration

1. Act as the primary contact person representing the DEC & City of Burlington on the project. The consultant will be responsible for contacting the Design Engineer/City/DEC to resolve any design related issues that may arise during construction.
2. Maintain communication with the PM on a regular basis.
3. Coordinate with the Municipality, Design Engineer, and the Construction Contractor.
4. Review and have a thorough understanding of contract plans, specifications, estimates and contract special provisions.
5. Coordinate, schedule and oversee the pre-construction conference. Coordinate, schedule and attend the Final Inspection. Attend all other job-related meetings.
6. Make sure contractor contacts Dig-Safe.
7. Preparation of Daily Reports, including documentation of pay item quantities.
8. Maintain a photographic record of the progress of construction, annotating such photos to indicate their content and context including date. This photographic record must be available for reference by the PM, Design Engineer, and Municipal representatives.
9. Accompany the PM, Design Engineer, and Municipal representatives on visits to the project.
10. Participate once every two weeks in regularly scheduled Construction Status meetings with the Contractor, PM, Design Engineer, and Municipal representatives.
11. Report immediately any unusual occurrences and all accidents occurring within the project limits to the PM and the Design Engineer.
12. Calculation and verification of the final contract quantities.
13. Review and submit to the City, or the Design Engineer if required by the City, any suggestions or requests made by the contractor to change or modify any requirements of the Plans or Contract Documents. Review and prepare any change orders required for the project, including coordination with the contractor, municipality and design consultant if needed. Change orders will include review and an opinion regarding the estimate for items of work that were not included in the original contract unit prices.
14. Receive certificates, computations and reference materials submitted by the Contractor. Maintain files on the project site of all items submitted by the contractor and of work done on behalf of the Municipality.
15. Review and verify a Contractors progress payment estimate.
16. Issue a Certificate of Substantial Completion at the appropriate time.

Task 2: Construction Inspection

1. Maintain a presence on the project during times when contractor and subcontractor activities are underway.
2. Act as a liaison between the Contractor and residents and businesses adjacent to the work areas for the purposes of facilitating the Contractor's work and direct impacts to residents and businesses.

Commented [LW1]: Not required for the City

Commented [ML2R1]: I would like daily reports to stay in but pay items are not critical. The benefit of keeping pay items in is to help document what was worked on.

Commented [LW3]: Not required for the City

Commented [LW4]: Not required for the City

Commented [ML5R4]: I think this could stay in to ensure the right folks are engaged for change orders if necessary

Commented [LW6]: Not required for the City

Commented [LW7]: Not required for the City

Commented [LW8]: This can be part time, but they should be on site for traffic control set up, significant work, and confirm work site conditions at the end of the day are acceptable and safe before the Contractor leaves.

3. Check that the contractor complies with all construction contract requirements, City of Burlington permits and ordinances; property rights agreements; erosion and sediment control; and stormwater management plan; state permits, regulations and statutes; and federal regulations and statutes; and exercise the engineer's authority as provided in the contract documents and report immediately any deviations to the PM.
4. Inspect and approve material sources and waste, borrow and staging areas, with due regard to approval/disapproval from the Vermont Agency of Transportation's Environmental Section.
5. Tracking of utility relocation and plotting of final facility locations on the final as-built plans (if any). As-built information shall be provided to Burlington's Water Resources Asset Manager to ensure Burlington's GIS data base is updated with accurate information. Since this is a sewer project it is anticipated that the following asset information should be accurately recorded at a minimum for the city: pipe type, pipe diameter, start/end points with tie measurements, and service connection locations with tie measurements.
6. Erosion control monitoring in accordance with applicable permits.
7. Review and verify traffic control activities.
8. Development of final as-built plans by marking up a set of contract plans.
9. Check that completed work complies with the plans and specifications and is true to line and grade.
10. Wear personal protective equipment, including appropriate headgear, footwear and reflectorized vest when on the project site, follow all health and safety protocols. Verify contractor compliance with VOSHA, and health and safety protocols within their contract or approved plans.
11. Provide and have on the project all necessary equipment, tools, and supplies needed to carry out the required duties.
12. Inspect work completed at such time as the contractor may claim substantial completion, with a contractor's representative, and issue a list of items to be corrected or completed.
13. Review proposed plans for any sewer bypass pumping and confirm that the City is in agreement with the Contractor's proposed approach.
14. Manage the process for proper water system user notification prior to planned water system shut off. Water system users shall receive a minimum of 1 business day notice (but ideally 2 business days) prior to water system shut off if the user received mail notification of the proposed work. Water System users who have not been notified of the work previously shall receive 3 business days of notice prior to water system shutoff at a minimum. Work with the City and the Contractor to ensure adequate notices are provided to customers. Work with the City and the Contractor to ensure there is a plan in place that is approved by the City for temporarily disconnecting service.
*Please note that a field office will not be provided.

Task 3: Materials and Equipment Inspection and Testing

1. Selectively check that materials and equipment are fabricated and tested in accordance with contract documents, in advance of installation; ensuring that the independent

laboratory is performing preliminary process control tests on material samples in accordance with Inspection Level 3 of VTrans Quality Assurance Program (QAP) and Materials Sampling Manual (MSM) to ensure continued quality in the work. Review the test reports and certificates and forward to the PM for decision on acceptability.
2. Check that materials submitted as pre-approved are on the current VTrans Pre-approved Material List or on the List of Materials with Advanced Certification.

Commented [LW9]: For this the City will often include VTrans specs within our contract documents so the references made connect.

Otherwise for sampling I would like at least one proctor for developing a compacting plan, and any additional as needed if the material that is being compacted changes significantly in gradation or moisture content.

Compaction testing on occasion to verify density is achieved in both the deeper subbase and the roadway subbase.

APPENDIX F

OFFSITE STORAGE FORM

VERMONT

AGENCY OF NATURAL RESOURCES

State of Vermont
Department of Environmental Conservation
Waste Management & Prevention Division
1 National Life Drive – Davis 1
Montpelier, VT 05620-3704
(802) 828-1138

MANAGEMENT OF NON-HAZARDOUS CONTAMINATED SOIL REQUEST FORM
July 2021

This form is to be used to assist in the compliance with the Investigation and Remediation of Contaminated Properties Rule (IRule) §35-803. This form takes the place of the ANR Off-site Soil Treatment Form and is to be used for the movement, stockpiling, treatment, or disposal of non-hazardous contaminated soils, both on-site and off-site. This form should be included with Soil Management Plans and Corrective Action Plans, as applicable. DEC Site Manager approval must be received, as signified by signature in Section 4, prior to the initiation of soil management work.

Section 1. General Information

Soil Source Site Name: _____

Address: _____

Facility ID#: _____and/or **Spill #**: _____and/or **SMS Site #**: _____

Will soils be temporarily stockpiled on-site or off-site for more than 90 days or between December 1st and April 1st?
__**Yes** ___**No** **if Yes, date range**: _____ to _____.

Disposal Facility: _____

Quantity of Soils: _____ cubic yards

Soil Contaminants: _____

Check proposed soil management scenario below:

☐ Soil will be live loaded and transported to disposal facility. **If yes, skip to Section 4.**
☐ Soil to be temporarily stored on/off site, then transported to disposal facility. **If yes, complete entire form**.
☐ Soil is Staying On-Site for Treatment. **If yes, complete entire form**.
☐ Soil is Destined for Off-Site Stockpile, Management and Treatment. **If yes, complete entire form.**

Section 2. Soil Stockpile Siting Criteria Checklist

☐ There are no potable drinking water supplies within 300-foot radius of the Soil Stockpile. This limit may need to be extended if water supplies are shown to be hydraulically down gradient.

☐ Soil Stockpile is not within zone one or two of a groundwater source protection area.

☐ *There are no sensitive environments within 100 feet of the treatment location including, but not limited to:

- Waterways (e.g., stream, river, lake, pond, wetland or floodplain zone);
- State or Federally listed threatened or endangered species or habitat;
- Class I or II groundwater zone;
- Residence; or
- Property boundary

- ☐ Public access to the soil is prohibited through posting no trespassing or other means approved by Secretary.
- ☐ If the owner of the soil stockpiling parcel is different from the soil generator, written approval from the landowner that also grants access to the Secretary, has been obtained before stockpiling begins.
- ☐ **The municipality in which the soils will be stockpiled or treated has been notified in writing of the soil stockpiling or treatment location. If applicable, local permits should be obtained. M**unicipal approval documents (letter, permit, etc.) attached.**
- ☐ ANR Atlas generated Map including the latitude and longitude of the location in decimal degrees where the soil will be stockpiled. Minimum acceptable accuracy is plus-or-minus 15 feet. **Map attached.**

*If setback criteria from sensitive receptors cannot be achieved, please provide written explanation.
**This is a requirement for off-site stockpiling of soils only.

Section 3. Ownership Information

Location of Soil Stockpile		**Generator/Owner of Soil/Responsible Party**	
Street Address	_____	Street Address	_____
	_____		_____
Company Name	_____	Company Name	_____
Landowner Name	_____	Owner Name	_____
Landowner Phone #	_____	Owner Phone #	_____
Landowner email	_____	Owner email	_____

Section 4. Signature Section

Responsible Party:

As the party responsible for compliance with the Investigation and Remediation of Contaminated Properties Rule and applicable statutes, I hereby certify that the representations made on this form are to the best of my knowledge true and correct.

_____ _____
Name of Owner/Operator Representative (printed) Company Title

_____ _____
Signature Date

Landowner:

As landowner of the soil treatment stockpile location, I hereby give approval to the soil generator to stockpile the soil volume cited above at the above referenced location. In addition, I hereby grant property access to DEC investigators for the purpose of inspecting the Soil Stockpile at any reasonable time.

_____
Print Name

_____ _____
Signature Date

DEC Site Manager Approval:

_____
Print Name

_____ _____
Signature of DEC Site Manager Date of Approval

VERMONT

Proposed Soil Staging Area

Vermont Agency of Natural Resources

vermont.gov

LEGEND

- Rare Threatened Endangered
  - Threatened or Endangered
  - Rare
- Wetland - VSWI
  - Class 1 Wetland
  - Class 2 Wetland
  - Buffer
- Wetlands Advisory Layer
- Private Wells
  - Incorrectly Located
  - GPS Located
  - Screen Digitized
  - E911 Address Matched
  - Welldriller/Clarion
  - Unknown Location Method
- SurfaceWaterSPA
  - Active
  - Inactive
- Ground Water SPA
  - Active
  - Proposed
  - Inactive
- Parcels (standardized)
- Roads
  - Interstate
  - US Highway; 1
  - State Highway

NOTES

Proposed Soil Staging Area
Whitcomb Quarry, Colchester, VT

356.0 0 178.00 356.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 584 Ft. 1cm = 70 Meters

THIS MAP IS NOT TO BE USED FOR NAVIGATION

APPENDIX G

WASTE MANAGEMENT DOCUMENTATION

Special Waste Characterization Profile

I. Requested Facility *Choose all that apply*

- ☐ **Massachusetts:** Southbridge (Southbridge, MA)
- ☐ **Maine:** Hawk Ridge (Unity, ME)
- ☐ **Maine:** Juniper Ridge (Old Town, ME)
- ☐ **New Hampshire:** NCES (Bethlehem, NH)
- ☐ **Pennsylvania:** McKean (Mt. Jewett, PA)
- ☐ **Vermont:** NEWSVT (Coventry, VT)
- ☐ **New York:** Chemung County (Lowman, NY)
- ☐ **New York:** Clinton County (Morrisonville, NY)
- ☐ **New York:** Grasslands (Chateaugay, NY)
- ☐ **New York:** Hyland (Angelica, NY)
- ☐ **New York:** Ontario County (Stanley, NY)
- ☐ **Other:** _____

II. Generator

Name: _____

Mailing Address: _____

City: _____ State: _____ ZIP Code: _____

Contact Name: _____ Title: _____

Phone: _____ Fax: _____ Email: _____

III. Bill To Customer ☐ *Same as Generator above*

Company Name: _____

Billing Address: _____

City: _____ State: _____ ZIP Code: _____

Contact Name: _____ Title: _____

Phone: _____ Fax: _____ Email: _____

IV. Consultant/Representative

Company Name: _____

Contact Name: _____ Title: _____

Phone: _____ Fax: _____ Email: _____

V. Delivery and Quantity ☐ ***One-Time Event*** *or* ☐ ***On-Going (Annually)***

Amount to Be Delivered (Estimated): _____ ☐ Tons ☐ Cubic Yards ☐ Other: _____

Density of Waste (Approximate): _____ Pounds/Cubic Yard

Delivery Vehicle: ☐ Roll-off ☐ Packer Truck ☐ Tractor Trailer ☐ Vac Truck ☐ Other: _____

Hauler Name: _____

Mailing Address: _____ Phone: _____

Transporter Permit #: _____ (for State of Disposal)

Previous Disposal Facility (Name): _____

Application Was Submitted to/Approved by Another Disposal Facility (Name): _____

VI. Waste Stream Information

Common Waste Name: _____

Location or Address of Waste Generation Site: _____

City: _____ State: _____ ZIP Code: _____ County: _____

Site Type: ☐ Industrial/Manufacturing ☐ Commercial ☐ Residential
☐ Institutional ☐ Municipal ☐ Other: _____

a. Waste Generation Process ☐ *Check if detailed Process Description is attached as a separate document*

Describe the site and waste generating process. Please be as detailed as possible. Include a process flow diagram if available.

b. Waste Description ☐ *Check if detailed Waste Description is attached as a separate document*

Describe the source of contaminants and materials used to generate the waste. Please be as specific and detailed as possible.

Describe all hazardous or nuisance properties associated with the waste:

Describe any special handling or disposal procedures:

Consistency at 70°F: ☐ Solid; ☐ Semi-Solid; ☐ Sludge; ☐ Liquid; ☐ Powder; ☐ Other _____

Ignitable (per 40 CFR 261.21): ☐ Yes ☐ No

Reactive (per 40 CFR 261.23): ☐ Yes ☐ No

Free Liquids: ☐ Yes ☐ No

% Solids: _____

Odor: _____

pH Range: _____

Is the waste an EPA listed hazardous waste under 40 CFR 261? ☐ Yes ☐ No

Is the waste non-hazardous waste from a CERCLA site? ☐ Yes ☐ No

Is the waste considered hazardous in the state of origin or the state of disposal? ☐ Yes ☐ No

Is the waste a treated hazardous waste, a de-listed hazardous waste or subject to land disposal restrictions (LDR) under 40 CFR 268, Subpart D? ☐ Yes ☐ No

c. Analytical Data

*At a minimum, full RCRA waste characterization analysis is required (§ 40 CFR 261) unless the applicant provides acceptable justification for submittal of less comprehensive data. The **generator** is responsible for proper waste characterization.*

Is representative waste characterization analysis attached?

☐ Yes → Please complete Appendix A of profile form.

☐ No → Please provide detailed explanation supporting the use of generator knowledge in lieu of analysis:

VII. Generator Certification

I hereby certify that (1) I am the duly authorized representative of the generator; (2) all information submitted on this form and on supplemental materials is true and accurate; (3) the information provided herein, including any supplemental information, such as laboratory analytical, SDS, etc., accurately describes the waste stream to be delivered to the facility and that all known or suspected hazards have been disclosed; (4) Casella can contact the laboratory directly to discuss our attached waste stream. I understand that once the waste stream is approved by Casella based on this information, any deviation in the source, composition, constituents or characteristics of the waste stream from the information described herein, may render the waste stream unacceptable for disposal, at the sole discretion of Casella. I further understand that any deviation from the information contained herein will require immediate notification to the disposal facility and cessation of disposal.

Signature (Generator): _____

Name (Print): _____ Company: _____

Title: _____ Date: _____

Appendix A

Additional Waste Stream Information

It is the Generator's responsibility to properly characterize the waste and demonstrate it is classified as non-hazardous by State and Federal regulations.

1. Samples

Samples collected and analyzed for waste characterization should be done in accordance with the EPA SW-846 Guidance Document and most recent approved EPA Method(s) for solid wastes.

Number of Samples: ____ Grab ____ Composite

Sample Source: ____ Boring(s) ____ Test Pit(s) ____ Stockpiles(s) ____ Core ____ Container

Soil/remediation projects must include a site map indicating area of excavation and sample locations.

2. Analysis

Please indicate all chemical analysis provided to support waste characterization. All testing must be performed by a laboratory certified in the State the waste is to be disposed in, where applicable.

Laboratory Name: _____ Laboratory Accreditation #: _____

Applicable Laboratory Report ID #'s: _____

Minimum Requirements

- ☐ TCLP RCRA 8 Metals
- ☐ TCLP Volatile Organic Compounds (VOCs)
- ☐ TCLP Semi-Volatile Organic Compounds (SVOCs)
- ☐ TCLP Herbicides
- ☐ TCLP Pesticides
- ☐ Reactive Sulfide
- ☐ Reactive Cyanide
- ☐ Total PCBs
- ☐ % Solids (Moisture Content)
- ☐ Free Liquids (Paint Filter)
- ☐ Corrosivity by pH
- ☐ Ignitability / Flashpoint

Additional Requirements

- ☐ Total TPH [1]
- ☐ Total PAH's [1]
- ☐ Total Organic Halogens (TOX)
- ☐ Total BTEX
- ☐ TCLP Copper [2]
- ☐ TCLP Nickel [2]
- ☐ TCLP Zinc [2]
- ☐ TCLP Vanadium [3]
- ☐ Total Sulfur/Sulfate
- ☐ TCLP PCBs
- ☐ Total Dioxins & Furans

Total Analysis AND Water Leaching Procedure (ASTM) Method D3987

- ☐ COD [2]
- ☐ Total Solids [2]
- ☐ Total Volatile Solids [2]
- ☐ Oil and Grease or Petroleum Hydrocarbons [2]
- ☐ Ammonia-Nitrogen [2]

Other

- ☐ Radiological analysis: U-238, RA-226, RA-228, TH-232, and K-40 by EPA test procedure 901.1 dry weight analysis expressed in pCi/g.
- ☐ Gamma field scans on the material and expressed in uR/hr or uRem/hr.
- ☐ Safety Data Sheets (SDS)
- ☐ Other_____

3. Generator Knowledge Statement

If the chemical analysis provided does not meet the minimum requirements, please provide an analysis waiver request with justification based on generator's knowledge of the process generating the waste.

1 VT only
2 PA only
3 ME only

Please print or type.

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
VTP0005809 24	1	800 899-4672	006659493 GBF

GENERATOR

5. Generator's Name and Mailing Address
Att: Chapin Spencer
City of Burlington - Dept of Public Works
645 Pine Street
Burlington VT 05401
Generator's Phone: 802 863-9094

Generator's Site Address (if different than mailing address)
City of Burlington - Elmwood Ave ROW
Elwood Ave ROW
Burlington VT 05401

6. Transporter 1 Company Name
NRC East Environmental Services, Inc.

U.S. EPA ID Number
MAC300098399

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address
ENPRO SERVICES OF VERMONT, INC.
54 AVENUE D
WILLISTON VT 05495
Facility's Phone: 802 860-1200

U.S. EPA ID Number
VTR000517052

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. RQ NA3077, Hazardous waste, solid, n.o.s. (Trichloroethylene, Tetrachloroethene) 9, PGIII	3	CF	800	P	D040	D039	
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1)(S,E) WP# 84473; App# (VT-1220-) ERG#171

NRC JOB# 146363

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name	Signature	Month	Day	Year
Martin Lee	Martin Lee	12	1	20

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name	Signature	Month	Day	Year
JAMES ROBIDEAU	James W Robideau	12	01	2020
Transporter 2 Printed/Typed Name	Signature	Month	Day	Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)

U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name	Signature	Month	Day	Year

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

Waste Information Profile Form

NRC Environmental of Maine, Inc.
106 Main Street
S. Portland, ME 04106
Phone: 207.799.0850 Fax: 207.779.5565
MED019051069

ENPRO Services of Vermont, Inc
54 Avenue D
Williston, VT 05495
Phone: 802.860.1200 Fax: 802.860.7202
VTR000517052

Profile #: 84473 **Process Code:** DDF **Approval Code:** VT-1220-

1. Generator Information:
Generator Name: City of Burlington - Dept of Public Works
Mailing Address: 645 Pine Street
City: Burlington State: VT Zip: 05401 Phone: 802-863-9094
Site Address: Elwood Ave ROW
City: Burlington State: VT Zip: 05401
Technical Contact: Chapin Spencer Phone: 802-863-9094
Site EPA ID: VTP000560924 NAICS Code:

2. Billing Information:
Customer Name: NRC East Environmental Services, Inc.
Address: 114 Bridge Road
City: Salisbury State: MA Zip: 09152
Billing Contact: Jim Kuehn Email:
Phone: 978-465-1595 Fax: 978-465-2050

3. Waste Description:
Common Name of Waste: Sewer Pipe
Process Generating Waste: sewer pipe removal - third party contamination

4. Physical & Chemical Properties
Color: Varies Odor ☒ None ☐ Mild ☐ Strong Describe: None

Flash Point (F°)	BTU/lb		Free Liquids? ☐ Yes ☒ No
☐ <100	☐ <2000	☒ Solid	100.00 % Solids ____ % Liquids
☐ ≥100-140	☐ 2,000-6,000	☐ Liquid	Will waste dump out of drums? ☒ Yes ☐ No
☐ ≥140-200	☐ >6,000-10,000	☐ Sludge	Is the waste pumpable? ☐ Yes ☒ No
☒ >200	☐ >10000	☐ Semi-solid	Debris?(List type in Section 7) ☐ Yes ☒ No
☐ N/A	☒ N/A	☐ Powder	Is the waste dusty? ☐ Yes ☒ No
		☐ Gas	

Specific Gravity	Viscosity	pH	Other Components	
☐ < 0.8 (Light oil)	☐ Low (Water)	☐ ≤ 2.0	Total cyanides	(ppm) 0.00
☐ 0.8-1.0 (Water based)	☐ Med (Pump on)	☐ >2.0-5	Total sulfides	(ppm) 0.00
☐ > 1.0 (Chlorinated Solvents)	☐ High (Molasses)	☐ >5-9	PCBs	(ppm) 0.00
☒ N/A	☒ N/A	☐ >9-12.49	Total Halogens /HOC	(%) 0.00
		☐ ≥ 12.5	Total VOC	(ppm) 0.00

5. Hazardous Properties: (Check all that apply)

☒ None	☐ Radioactive	☐ Pyrophoric	☐ Oxidizer
☐ Water Reactive	☐ Dioxins	☐ Explosive	☐ Medical Waste/Infectious
☐ Shock Sensitive	☐ Air Reactive	☐ Reactive Cyanide	☐ Reactive Sulfide
☐ Asbestos	☐ Benzene NESHAP	☐ Pesticide/Herbicide	☐ Peroxide Forming Compound

6. Regulatory Status (Check all that apply)

Y	N	
☒	☐	USEPA Hazardous Waste per 40 CFR 261 (If yes list codes) D040, D039
☐	☒	Do any state waste codes apply? (If yes list codes)
☒	☐	Is this waste subject to land ban restrictions ?
		Is this a ☐ wastewater ☒ non wastewater
☐	☒	If DOO1-D043, are any underlying hazardous constituents (UHC) present
☐	☒	Does this waste contain VOC's ≥ 500 ppm (subpart CC)

Form Code W002 Source Code G15

NRC

Profile #: 84473

7. Composition of Waste: (List all haz. And non-haz. Constituents)

Piping	100.00 - 100.00%		- %
see attached analytical	0.00 - 100.00%		- %
Trichloroethylene	< 0.01 - < 0.01 %		- %
Tetrachloroethene	< 0.01 - < 0.01 %		- %
	- %		- %
	- %		- %
	- %		- %
	- %		- %
	- %		- %
	- %		- %

8. DOT Shipping Information: (include PG, UN/NA, and Haz. Class)

NA3077, Hazardous waste, solid, n.o.s. (Trichloroethylene, Tetrachloroethene)
9, PGIII

Poison Inhalation Hazard: € YES ☒ NO Zone: _____

Method of Shipment: € Bulk Liquid € Bulk Solid € Drums € Other Container type size: _____

Volume per shipment: _____ € Gallons € Tons € Drums ☒ Other _____

Frequency: € One Time € Weekly € Monthly € Quarterly € Yearly € Other _____

Does this material require any special handling? € Yes ☒ No If yes, explain: _____

9. Inorganic Metals: ☒ None € TCLP € Totals € Generator Knowledge in mg/l

D004 Arsenic (5mg/l)	0.00	D011 Silver (5mg/l)	0.00	Manganese	0.00
D005 Barium (100mg/l)	0.00	Aluminum	0.00	Molybdenum	0.00
D006 Cadmium (1mg/l)	0.00	Antimony	0.00	Nickle	0.00
D007 Chromium (5mg/l)	0.00	Beryllium	0.00	Thallium	0.00
D007 Chromium-Hex	0.00	Cobalt	0.00	Tin	0.00
D008 Lead (5mg/l)	0.00	Copper	0.00	Zinc	0.00
D009 Mercury (0.2mg/l)	0.00				
D010 Selenium (1mg/l)	0.00				

10. Organic Compounds € None € TCLP € Totals € Generator Knowledge in mg/l

D012 Endrin (0.02)	0.00	D023 o-Cresol (200)	0.00	D034 Hexachloroethane (3.0)	0.00
D013 Lindane (0.4)	0.00	D024 m-Cresol (200)	0.00	D035 Methyl ethyl ketone (200)	0.00
D014 Methoxychlor (10)	0.00	D025 p-Cresol (200)	0.00	D036 Nitrobenzene (2)	0.00
D015 Toxaphene (0.5)	0.00	D026 Cresol (200)	0.00	D037 Pentachlorophenol (100)	0.00
D016 2,4-D (10)	0.00	D027 1,4-Dichlorobenzene (7.5)	0.00	D038 Pyridine (5)	0.00
D017 2,4,5 TP Silvex (1)	0.00	D028 1,2- Dichloroethane (0.5)	0.00	D039 Tetrachloroethylene (0.7)	0.00
D018 Benzene (0.5)	0.00	D029 1,1-Dichloroethylene (0.7)	0.00	D040 Trichloroethylene	20.00
D019 Carbon Tetrachloride (0.5)	0.00	D030 2,4 Dinitrotoluene (0.3)	0.00	D041 2,4,5-Trichlorophenol	0.00
D020 Chlordane (0.03)	0.00	D031 Heptachlor (& epoxide) (0.008)	0.00	D042 2,4,6-Trichlorophenol	0.00
D021 Chlorobenzene (100)	0.00	D032 Hexachlorobenzene (0.13)	0.00	D043 Vinyl Chloride	0.00
D022 Chloroform (6.0)	0.00	D033 Hexachlorobutadiene (0.5)	0.00		

11. Attached Documents: € Lab Data € MSDS € Packing List € Other

12. Generator Certification: I hereby certify that I am the agent of the generator, and warrant on behalf of the generator, that all information submitted herein and attached documentation contains true, accurate and complete description of this material. Any sample submitted for analysis is representative of the material being offered for approval. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. I will notify ENPRO of any changes in generator status, any information on this form, or any information on attachments. This certification and signature apply to this form, to all attachments checked in Section 11, and to the land disposal restriction notification (LDR) generated from this information.

Signature	Printed Name	Title	Date
Mat Lee	Martin Lee	Engineer	12/1/2020

NRC Land Disposal Restriction Form

Generator Name & Location: City of Burlington - Elmwood Ave ROW
Elmwood Ave ROW, Burlington, VT 05401

NRC Job#: 146363

EPA ID # VTP000560924

Manifest # 006669493GBF

Waste Analysis Available NO

Transporter: NRC East Environmental Services, Inc

(A) Manifest Line Item (Line #)	(B) Profile#	(C) Non-Regulated List State Code if not regulated by RCRA	(D) RCRA Waste Codes (List all that apply)	(E) Treatability Group Circle One: NWW:>1% TOC & >1% TSS	(F) F001-F005 Regulated Constituent (List numbers from Table 1)	(G) UHC's (See Table 2)
1	84473		D039, D040	NWW		

How must the waste streams above be managed? (Please check appropriate box(s) below)

X The wastes identified above must be treated to meet the applicable treatment standards in 40 CFR 268.40 in accordance with 40 CFR 268.7 (a) (2).

☐ The waste identified above is hazardous waste contaminated soil and **does** / **does not** require treatment to meet the soil treatment standards as provide by 40 CFR 268.49 (c).

☐ This hazardous debris identified above must be treated to the alternative treatment standards in 40 CFR 268.45

☐ Lab Pack wastes subject to alternative treatment standards under 40 CFR 268.42 (c).

I certify under penalty of law that the above information is accurate and true to the best of my knowledge and that the above information complies with all applicable LDR Certifications required under the 40 CFR.

Signature: Martin Lee **Date** 12/1/2020

Print Name: Martin Lee

Alice Henry

From: Nahmias, Michael <Michael.Nahmias@vermont.gov>
Sent: Wednesday, October 7, 2020 4:27 PM
To: Erik Urch; Caldwell, Kimberly
Subject: [EXTERNAL] RE: Elmwood Avenue Sewer Pipe RFP

Soils would not be f-listed either for the same reason.

Michael Nahmias

[phone] 802-522-4595

[email] michael.nahmias@vermont.gov

From: Erik Urch <Erik.Urch@atcgs.com>
Sent: Wednesday, October 7, 2020 4:21 PM
To: Nahmias, Michael <Michael.Nahmias@vermont.gov>; Caldwell, Kimberly <Kimberly.Caldwell@vermont.gov>
Subject: RE: Elmwood Avenue Sewer Pipe RFP

Mike,

One more thing, your email indicates the pipe would not be F-listed hazardous waste but what about the soils? I'm working with NRC and they need confirmation on this.

Erik Urch | SENIOR PROJECT MANAGER | **ATC Group Services LLC**
Office +1 802 862 1980 | Direct +1 802 871 8363 | Cell +1 802 338 5826

51 Knight Lane | Williston, VT 05495
erik.urch@atcgs.com | www.atcgroupservices.com

From: Nahmias, Michael <Michael.Nahmias@vermont.gov>
Sent: Tuesday, October 6, 2020 1:03 PM
To: Erik Urch <Erik.Urch@atcgs.com>; Caldwell, Kimberly <Kimberly.Caldwell@vermont.gov>
Subject: [EXTERNAL] RE: Elmwood Avenue Sewer Pipe RFP

Hi Erik,

I spoke with Steve Simoes and he said that since the sewer pipe is not directly a part of the facility that used PCE that it can be stockpiled pending characterization. Meaning it is not automatically an f-listed waste. From my conversation with Steve, it seems as though if we were dealing with the pipe that directly served the drycleaner (i.e. their dedicated pipe that brings the washwater to the Sewer System), then it would have to be treated as F-listed or require a contained in determination. So I do not think it is appropriate for this work, however when you send us a final work plan, I will be checking with Steve to make sure this is all in line with the hazardous waste regulations.

With regards to the soil, I think your calculation is a safe bet. The soils are going to have to be treated differently that the sewer pipe. I am not sure DEC is comfortable stockpiling soils pending characterization. What options do we have for soils and their disposal, given that we want to avoid stockpiling?

Michael Nahmias

[phone] 802-522-4595

[email] michael.nahmias@vermont.gov

From: Erik Urch <Erik.Urch@atcgs.com>
Sent: Tuesday, October 6, 2020 10:53 AM
To: Caldwell, Kimberly <Kimberly.Caldwell@vermont.gov>
Cc: Nahmias, Michael <Michael.Nahmias@vermont.gov>
Subject: RE: Elmwood Avenue Sewer Pipe RFP

Thanks Kim,

Do you think we could assume that the sewer pipe material will be at concentrations low enough to request contained in determination? Otherwise, we would have to assume F-listed hazardous waste storage & disposal requirements within the right of way since the City requested we manage the waste onsite rather than move to one of their facilities. Same question for soils. I've attached most recent contained in letter we received from DEC for the Enterprise Aly project. I'm unaware of any changes with these requirements since then.

Also, do you think 45 CY of contaminated soils would be appropriate for estimating/coordinating purposes? This should be a conservative estimate as it assumes 5 ft profile of contaminated soils surrounding the entire 40 ft x 5 ft excavation area with a 15% "fluff" factor.

APPENDIX H

PRELIMINARY BREAKDOWN OF ESTIMATED COSTS

Table 1
Elmwood Avenue ROW, Burlington, VT
CAP Implementation - Preliminary Breakdown of Estimated Costs
3/10/2022

Task	Type	Units	Qty	Rate	*Mark Up*	Item Total	Sub Total	Task Total
1. Project Preparation								
Atlas Labor	Principal	hrs	6	130	--	780		
and Expenses	Sr Project Manager	hrs	40	105	--	4,200		
	Staff Scientist	hrs	20	80	--	1,600		
	Mileage (2 trips)	mi	40	0.575	--	23		
		Total						**6,603**
2. Sewer Line Removal/Replacement								
Atlas Labor								
and Expenses	Sr Project Manager	hrs	30	105	--	3,150		
assumes 10 days	Staff Scientist (6 days)	hrs	60	80	--	4,800		
	Sr Field Technician (all days)	hrs	100	65	--	6,500		
	PID	day	10	90	--	900		
	Sampling Supplies	ea	36	15	--	540		
	Mileage (10 trips)	mi	200	0.575	--	115		
		Atlas Subtotal					16,005	
Excavation Subcontractor	Sawcut Existing Pavement	LF	440	10	*1.05*	4,620		
	Trench Excavation & Shoring	LS	1	29000	*1.05*	30,450		
	Install Sewer Pipe	LF	160	110	*1.05*	18,480		
	Backfill Trench w/Existing Fill	LS	1	19250	*1.05*	20,213		
	Trench Pavement Repair	SY	222	109	*1.05*	25,408		
	General Conditions & Mobilization	LS	1	22300	*1.05*	23,415		
		Excavation Subtotal					122,585	
Waste Disposal	Organic Solids/Debris, Chlor Solvents	CYBs	12	1325	*1.05*	16,695		
	Cubic Yard Box	ea	12	125	*1.05*	1,575		
		Waste Disposal Subtotal					18,270	
Laboratory Subcontractor	Soil/Sewer Pipe 8260 PCE/TCE	sample	36	120	*1.05*	4,536		
	Pipe sample lab processing	sample	18	25	*1.05*	473		
	Waste composite samples	sample	2	1000	*1.05*	2,100		
		Laboratory Subtotal					7,109	
Inspection Services Sub	Construction Inspection	ea	1	8100	*1.05*	8,505		
	Materials & Equipment - Testing	ea	1	835	*1.05*	877		
		Inspection Services Subtotal					9,382	
		Task Subtotal						**173,351**

Table 1
Elmwood Avenue ROW, Burlington, VT
CAP Implementation - Preliminary Breakdown of Estimated Costs
3/10/2022

Task	Type	Units	Qty	Rate	*Mark Up*	Item Total	Sub Total	Task Total
3. Soil Vapor Monitoring								
Atlas Labor	Sr Project Manager	hrs	4	105	--	420		
and Expenses	Staff Scientist	hrs	8	80	--	640		
Project Prep, Site Visit	Mileage	mi	20	0.575	--	12		
		Atlas Subtotal					1,072	
Private Locator Subcontractor	Utility Locator	hrs	6	150	*1.05*	945		
		Locator Subtotal					945	
Atlas Labor	Sr Project Manager	hrs	4	105	--	420		
and Expenses	Sr Field Technician	hrs	10	65	--	650		
Drilling Oversight	PID	day	1	90	--	90		
	Hand Auger	day	1	30	--	30		
	Mileage	mi	20	0.575	--	12		
		Atlas Subtotal					1,202	
Drilling Subcontractor	Mob/Demob	LS	1	320	*1.05*	336		
	Utilivac - 2 Man Crew	hr	6	185	*1.05*	1,166		
	Vapor implants (1/4", 6" SS)	ea	9	54	*1.05*	510		
	Vapor implant - tubing/material	ft	30	3.6	*1.05*	113		
	7" well box	ea	9	47	*1.05*	444		
	Permit & Bond Acquisition	LS	1	375	*1.05*	394		
	Traffic Control, Sign Package	day	1	1450	*1.05*	1,523		
		Driller Subtotal					4,486	
Survey Subcontractor	GPS survey, reduction	hr	8	70	*1.05*	588		
		Survey Subtotal					588	
Atlas Labor	Sr Project Manager	hrs	6	105	--	630		
and Expenses	Staff Scientist	hrs	12	80	--	960		
Soil Vapor Sampling	Sr Field Technician	hrs	12	65	--	780		
	PID	day	1	90	--	90		
	Micromanometer	day	1	75	--	75		
	Helium Detector	day	1	90	--	90		
	Helium	ea	1	50	--	50		
	Sample supplies	ea	9	15	--	135		
	Mileage	mi	20	0.575	--	12		
		Atlas Subtotal (2 events)					5,643	
Laboratory Subcontractor	Soil Vapor TO15 PCE/TCE	sample	10	215	*1.05*	2,258		
		Laboratory Subtotal (2 events)					4,515	
Atlas Labor	Principal	hrs	2	120	--	240		
and Expenses	Sr Project Manager	hrs	12	105	--	1,260		
Report	Staff Scientist	hrs	8	80	--	640		
	CADD Operator	hrs	6	60	--	360		
	Adminstrative	hrs	1	60	--	60		
		Atlas Subtotal (2 reports)					5,120	
		Task Subtotal						**23,570**
4. CAP Completion Report								
	Principal	hrs	6	120	--	720		
	Sr Project Manager	hrs	40	105	--	4,200		
	Project Scientist	hrs	10	90	--	900		
	CADD Operator	hrs	10	60	--	600		
	Adminstrative	hrs	2	60	--	120		
		Task Subtotal						**6,540**
		Project Total						**210,063**