Corrective Action Plan

The Yellow Barn Site
281 VT Route 15 West
Hardwick, VT 05836

EPA Cooperative Agreement Number:
BF-00A00480

VT DEC SMS Site #2019-4834

November 4, 2019

Prepared for:

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Sign-off Sheet

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Prepared by Kyle T. Stone
(signature)

Kyle Stone, EIT

Reviewed by David A. Allwine
(signature)

David Allwine, PG

This Corrective Action Plan was prepared under my direction and outlines corrective action activities proposed for the Yellow Barn project in Hardwick, Vermont. I certify that I have reviewed the remedial system design incorporated in this Corrective Action Plan. 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.

Approved by C.R. Gendron
(signature)

Craig R. Gendron, Vermont PE #018-0007111

STATE OF VERMONT
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PROFESSIONAL ENGINEER

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Executive Summary

On behalf of the Northeastern Vermont Development Association (NVDA), Stantec Consulting Services Inc. has prepared this Corrective Action Plan (CAP) for the Yellow Barn property (the Site) located at 281 VT Route 15 West in Hardwick, Vermont (the Site). The CAP was funded through a U.S. Environmental Protection Agency (USEPA) Brownfield Community-Wide Assessment Grant. Site eligibility for use of Grant funding for the CAP was approved by the USEPA on January 29, 2019, and by the Vermont Department of Environmental Conservation (VTDEC) on January 30, 2019.

The Site consists of one parcel identified in municipal assessment records as Parcel #09001. The Site encompasses approximately 4.7 acres of land, which is developed with a 4,300 square-foot three-story barn (referred to as the “Yellow Barn”) and a 3,600 square-foot storage shed. The two wooden buildings are connected on their western ends by a 300 square-foot wooden breezeway structure.

The primary objective of this CAP was to review environmental documentation and proposed development plans for the Site to develop an effective corrective action that protects human health and the environment from possible exposure to contaminants.

The current Site owner, 1781 Group LLC, plans to sell the Site to the Town of Hardwick. The Town of Hardwick, in cooperation with NVDA and the Vermont Center for an Agricultural Economy, plans to redevelop the Site as the Yellow Barn Business Accelerator Project that includes renovation of the existing Yellow Barn (or barn) with one first-floor commercial tenant space and the construction of a new Accelerator Building on the Site, located west of the barn. The Accelerator Building will include additional tenant spaces anchored by The Cellars at Jasper Hill, a cheese aging and distribution operation. Also, as part of the redevelopment, the exiting storage shed, and breezeway are to be demolished and the existing septic tank and leach field piping are to be excavated and removed. Foundation installation for the proposed building will include excavation of existing Site soils and ground improvements to provide structural stability for the building’s finished concrete floor slabs. Ground improvements will likely include compacted stone columns, to a depth of 4 feet (ft) below ground surface (bgs). Significant fill imported from off-Site will likely be required on the western portion of the new building slab to bring the existing ground surface to grade.

Past environmental investigations detected elevated levels of arsenic, cadmium, and lead in a septic effluent sample from the septic tank located in the western portion of the Site. Although Stantec’s Phase II subsurface investigation of the leach field area did not indicate impacts to soil or groundwater above Vermont standards from this potential contaminant source, previous sampling data indicates that heavy metal contamination may be present, and additional investigation is warranted. Therefore, this issue is addressed in this CAP.

Similarly, although the detected polynuclear aromatic hydrocarbon (PAH) concentrations in the SS-1 and SS-2 shallow soil samples collected during Stantec’s Phase II investigation did not exceed Vermont

Screening Levels (VSLs), the elevated laboratory reporting limits for these samples were above associated VSLs, and so represent a data gap. Therefore, this issue is also being addressed in this CAP.

Based on the results of previous investigations, and considering the redevelopment and remedial objectives of the site, this CAP includes the following components intended to mitigate potential impacts to human health and the environment:

- The site septic system (tank and leach field piping) will be excavated and disposed of off-site to remove it as a potential source of metals discharge to the subsurface. As part of the removal, soil samples will be collected from effluent discharge points for analysis of arsenic, cadmium, and lead to evaluate soil quality in the vicinity of the septic system.
- Concurrently with the investigation of the septic system, soil samples will also be collected from the same depths and locations (as close as can be achieved) as the SS-1 and SS-2 samples collected in the east end of the storage shed during the Phase II investigation. These samples will be analyzed for polycyclic aromatic hydrocarbons (PAHs) using EPA Method 8270 SIM to obtain laboratory reporting limits below Vermont standards.
- The need for additional remedial activities will be based on the findings of the soil sample analysis described above, specifically:
    - If none of the sample results exceed applicable Vermont soil standards, no additional remedial activity will be necessary.
    - If sample results exceed applicable Vermont soil standards, implementation of additional remedial options intended to prevent exposure of potential receptors to contaminated site media will be required. The proposed remedy will include the following elements:
        - Implementation of erosion and sediment control measures including a stabilized construction entrance;
        - Construction of bermed and poly-lined material stockpiles to contain excavated and graded soils prior to sampling to evaluate for off-Site disposal;
        - Management of an estimated 75 cubic yards (CY) of excavation soils from the previously completed septic system excavation including the sampling of stockpiled soils for waste characterization and profiling prior to off-Site disposal at a local, VTDEC-permitted, non-hazardous waste facility;
        - Management of an estimated 4,465 CY of uncontaminated, but unsuitable or excess, soils excavated and/or graded during Site redevelopment; and
        - Prepare a summary Corrective Action Construction Completion report.

Abbreviations

bgs	Below Ground Surface
CAP	Corrective Action Plan
COC	Certificate of Completion
CSM	Conceptual Site Model
CVOC	Chlorinated Volatile Organic Compound
ECAA	Evaluation of Corrective Action Alternatives
ESA	Environmental Site Assessment
ft.	Feet
GPR	Ground Penetrating Radar
IC	Institutional Control
IRule	Environmental Protection Rules Chapter 35, Investigation and Remediation of Contaminated Properties Rule, State of Vermont Department of Environmental Conservation (eff. July 6, 2019).
LEE	LE Environmental
LLC	Limited Liability Corporation
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NAPL	Non-aqueous Phase Liquid
NVDA	Northeastern Vermont Development Association
OHM	Oil or Hazardous Material
O&M	Operation and Maintenance
OPC	Opinion of Probable Cost
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector

Poly	Polyethylene Sheeting
QA/QC	Quality Assurance/Quality Control
QEP	Qualified Environmental Professional
RCRA	Resource Conservation and Recovery Act
REA	Ross Environmental Associates
REC	Recognized Environmental Condition
Redox	Reduction/Oxidation
Secretary	Vermont Secretary of the Agency of Natural Resources
SOP	Standard Operating Procedure
SS	Surface Soil
SG	Soil Gas
SVOC	Semi-Volatile Organic Compound
TBD	To Be Determined
TCL	Target Compound List
TP	Test Pit
TW	Test Well
USEPA	United States Environmental Protection Agency
VES	Vapor Encroachment Study
VGES	Vermont Groundwater Enforcement Standard
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound
VT	Vermont
VTDEC	Vermont Department of Environmental Conservation
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

On behalf of the Northeastern Vermont Development Association (NVDA), Stantec Consulting Services Inc. (Stantec) has prepared this Corrective Action Plan (CAP) for the Yellow Barn property located at 281 VT Route 15 West in Hardwick, Vermont (the Site). The CAP was funded through a U.S. Environmental Protection Agency (USEPA) Brownfield Community-Wide Assessment Grant. Site eligibility for use of Grant funding for the CAP was approved by the USEPA on January 29, 2019, and by the Vermont Department of Environmental Conservation (VTDEC) on January 30, 2019.

The primary objective of this CAP was to review available Site documentation and proposed development plans for the Site to develop an effective corrective action that protects human health and the environment from possible exposure to contaminants. In addition, corrective actions were designed in a fashion that is compatible with future use and redevelopment of the Site. A full redevelopment plan of the Site has yet to be finalized. As such, the information provided within this CAP is subject to change based on final design decisions and other provided information. In accordance with § 35-607(e), if a change constitutes a major amendment to the CAP, an additional 30-day public notice period will be required per § 35-607(b). The corrective action proposed is based on preliminary redevelopment and schematic plans provided by Coe + Coe Architecture of West Glover Vermont. Assumptions made during the generation of this CAP have been included.

2.0 SITE INFORMATION AND HISTORY

The Yellow Barn Site is located at 281 Vermont (VT) Route 15 West in Hardwick, Vermont. The Site location is shown on **Figure 1**. The VTDEC Environmental Protection Rules Chapter 35, Investigation and Remediation of Contaminated Properties Rule, State of Vermont Department of Environmental Conservation (IRule) requires that submittals include certain information relative to the location and ownership of the Site. **Table 1**, below, provides a summary of required information:

Table 1: Summary of VTDEC Required Site Information

Site Address:	281 VT Route 15 West, Hardwick, VT 05843
Latitude/Longitude:	44.515661°N, -72.376288W
Parcel #:	09001
Owner:	1781 Group Limited Liability Corporation (LLC)
Owner Address:	3707 Bridgeman Hill Road Hardwick, VT 05843
Owner Contact Information:	Owner Representative: Andrew Myer (802) 498-4835 andrew@vermontsoy.com

2.1 SITE DESCRIPTION

The Site includes one parcel of land (Hardwick Tax Map Parcel 09001) that encompasses approximately 4.7 acres (see **Figure 2**). The Site is developed with three buildings, as follows:

1. The main building on the Site is the structure referred to as the Yellow Barn, an approximately 34-foot-wide by 116-foot-long structure with three levels and no basement. It is a wood frame and sided structure with a gambrel roof. The ground floor level has a cement floor. It was a cow barn for many years, with castings for troughs and stalls still present on the western side of the ground floor. Later, the ground floor was finished off with sheetrock walls and ceiling and it became an auto service shop for approximately 30 years. The second and third floors appear to have been a hay loft, and later may have been used to store auto parts.

2. An open storage shed is located to the south of the barn and is approximately 26-feet-wide by 115-feet-long. It is a wood framed and sided (3 sides) structure with a dirt floor and a shed roof pitched toward the south.

3. The barn and the shed are connected to each other on their west ends with an approximately 26-foot-long by 12-foot-wide wooden breezeway structure.

A small stream is located near the southwestern corner of the Site and flows westerly toward the Lamoille River. The western portion of the Site contains a snowmobile trailhead. Possible wetlands were reported near the off-Site stream, between the trailhead parking area and the historic railway line that abuts the Site to the south.

Groundwater depth and flow directions at the Site were evaluated during Stantec's 2019 Limited Phase II Environmental Site Assessment (ESA). Based on the findings of this investigation, water levels in temporary wells ranged from approximately 7 to 13 feet below ground surface (bgs). Calculation of water table elevations in the wells suggests that shallow groundwater flow at the Site is to the northwest towards the Lamoille River at a gradient of approximately 0.01 feet/foot.

Prior subsurface investigations at the Site by Ross Environmental Associates (REA) indicated shallow soils in the vicinity of the Yellow Barn consist of fine to medium sand to a depth of 4 ft. bgs, the maximum depth explored. Soils observed during Stantec's Phase II ESA consisted largely of sand, sand and gravel, and peat.

According to historical information provided in a Phase I ESA report completed in September 2018 by LE Environmental (LEE, 2018), the Site was vacant and unused except for the storage of new vehicles on the eastern portion of the Site by the adjacent Lamoille Valley Ford car dealership. The most recent Site use was the Greensboro Garage, an auto repair shop that operated for approximately 30 years. Use prior to the auto repair shop appears to have been agricultural.

The current Site owner, 1781 Group LLC, plans to sell the Site to the Town of Hardwick. The Town of Hardwick, in cooperation with NVDA and the Vermont Center for an Agricultural Economy, plans to redevelop the Site as the Yellow Barn Business Accelerator Project that includes renovation of the existing Yellow Barn (or barn) with one first-floor commercial tenant space and the construction of a new Accelerator Building on the Site, located west of the barn. The Accelerator Building will include additional tenant spaces anchored by The Cellars at Jasper Hill, a cheese aging and distribution operation.

2.2 SUMMARY OF PREVIOUS INVESTIGATIONS PERFORMED AT THE SITE

2.2.1 Ross Environmental Associates and LE Environmental Phase I and Phase II Reports, 2017 and 2018

Potential environmental concerns at the Site were evaluated as part of several Site investigations conducted in 2017 and 2018. REA conducted a Phase I ESA in 2017 and documented their results in a Phase I ESA report dated September 22, 2017 (REA, 2017). Based on their Phase I ESA findings, REA identified several potential possibilities of a release of oil or hazardous materials (OHM) based on the historical use of the Site as an automotive garage, for auto body and heavy equipment maintenance and repair, and due to the presence of a floor drain and slop sink in the barn building, which were identified as recognized environmental conditions (RECs). REA recommended the collection and laboratory analysis of samples from the outfall of the floor drain, soil samples from exploratory test pits, and an effluent sample from the former septic tank to further evaluate these issues. The recommended work was subsequently conducted and documented in REA's letter report titled Septic Tank and Soil Sampling & Analysis dated January 9, 2018 (REA, 2018).

Both REA reports were evaluated during LEE's 2018 Phase I ESA of the Site and were appended and discussed in LEE's Phase I ESA Report and Tier 1 Vapor Encroachment Screening Report dated September 28, 2018 (LEE, 2018). Issues identified by LEE, including those raised in the REA reports, are discussed below.

1. REA's Phase I ESA identified one recognized environmental condition (REC) and two business environmental risks. The REC included historical Site use of over 30 years as an auto garage with bodywork and equipment maintenance. One sealed floor drain and a slop sink located in the barn and connected to the on-Site septic system were identified. The business environmental risks included accumulated solid waste (tires, car parts, empty containers) and use of hazardous substances and petroleum products on-Site.

2. REA subsequently conducted a Phase II ESA to investigate the REC which included septic tank and soil sampling and analysis. Five test pits (TP-1 to TP-5) were dug between the barn and the storage shed, and the septic tank was located. One septic tank effluent sample (designated "tank") and five soil samples were collected. The slop sink was reportedly connected to the septic tank. The soil sample locations included beneath the floor drain discharge pipe where it exited the barn (designated "SS-1"), at the floor drain outfall pipe discharge location (designated "outfall"), and three test pit locations between the barn and the shed (TP-2, TP-4, and TP-5). The floor drain in the vehicle service area, was reportedly sealed in 2016 and discharged to the ditch on the Site on the south side of the shed building. All the samples (soil and septic tank) were tested for volatile organic

compounds (VOCs), and the outfall soil and septic tank effluent sample were tested for Resource Conservation and Recovery Act (RCRA) 8 metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) and polychlorinated biphenyls (PCBs).

3. No Vermont standards were exceeded for VOCs for the soil samples or the septic effluent sample. No PCBs were detected at the floor drain outfall or in the septic tank effluent. The septic tank effluent, however, exceeded the Vermont Groundwater Enforcement Standard (VGES) for several metals including lead (13 times its VGES), arsenic (1.4 times its VGES) and cadmium (5.4 times its VGES). Soil metals concentrations at the outfall location were within background levels.

4. In summary, REA concluded that no Vermont action levels or standards were exceeded for the septic tank effluent or soil samples collected during their assessment. The concentrations of arsenic, cadmium and lead detected in the septic tank sample did exceed the applicable VGES; however, the standards don't apply specifically to septic tank effluent. The absence of VOCs and PCBs in the septic tank sample suggested the former septic system was not a significant threat to the subsurface environment. Based on these sample results and field observations, REA recommended no further work be completed. It should be noted that the VTDEC did not have an opportunity to review the Phase I ESA recommendations or proposed subsurface work as presented by REA prior to its implementation. Based on their review of the work post-completion, significant portions of the work as described in their report did not satisfy the VTDEC regulatory requirements in place at the time it was conducted.

5. LEE's Phase I ESA findings, which include an evaluation of the prior REA Phase I/II ESA information, identified several RECs including:

   a) possible subsurface contamination in the leach field area due to discharges from the septic tank that accepted, in addition to sanitary wastes, effluent from a former shop sink in the Yellow Barn;

   b) possible subsurface contamination from petroleum, solvents, and PAHs due to historical Site use (auto repair/maintenance) and nearby off-Site uses (south-abutting former rail bed); and

   c) potential soil gas contamination on the Site due to historic Site use for auto repairs/maintenance and from the northeasterly-adjoining Lamoille Valley Ford Site.

LEE's Phase I ESA recommended the completion of a supplemental Phase II ESA and a Tier II Vapor Encroachment Study (VES) to determine if contamination is present due to the identified RECs and the vapor encroachment concern, and to obtain additional data that can be considered as part of the proposed Site redevelopment process.

2.2.2 Stantec Limited Phase II ESA, 2019

Following review of the available REA and LEE information, Stantec identified a number of data gaps in connection with the Site. Identified data gaps included the following:

1. Whether the identified discharges to the Site septic tank resulted in soil or groundwater impacts in the Site's leach field area from VOCs, petroleum, or metals;
2. Whether the surficial releases of OHM identified in the former Yellow Barn auto repair area and in the OHM storage area in the shed building resulted in soil or groundwater impacts at the Site from VOCs, petroleum, or metals;
3. Whether the presence of the south-abutting railroad right-of-way resulted in impacts to soil or groundwater quality at the Site from VOCs, petroleum, metals, pesticides, or herbicides; and
4. Whether the former use of the Site for auto repair/maintenance and the proximity of the northeasterly-adjoining Lamoille Valley Ford property resulted in soil vapor intrusion into the Yellow Barn building.

These data gaps informed Stantec's overall strategy for the Limited Phase II investigation at the Site, which consisted of the following scope:

- Completion of two (2) hand auger borings (SS-1 and SS-2) in the former waste storage area in the eastern portion of the storage shed and collection of two samples from each boring for analysis of VOCs, PAHs, and RCRA 8 metals;
- Advancement of eight (8) direct push soil borings (SB-1 to SB-6, SB-7A, and SB-8) to investigate the leach field area, a 275-gallon waste oil aboveground storage tank with floor staining, and an area of floor staining and floor cracks in the former auto service area of the Yellow Barn building. This work included collection of one soil sample per boring for analysis of VOCs, PAHs, and RCRA 8 metals;
- Collection of one additional shallow soil sample each from three (3) of the eight (8) borings, including SB-1, SB-2 and SB-8, to evaluate potential surficial impacts from the former use of the south-abutting lot for rail operations. These shallow soil samples were analyzed for PAHs, RCRA-8 metals, pesticides, and herbicides;
- Completion of six (6) of the eight (8) borings as temporary 1-inch polyvinyl chloride monitoring wells (TW-1 to TW-5, and TW-8) and collection of groundwater samples for analysis of VOCs, PAHs, and RCRA 8 metals;
- Collection and analysis of additional groundwater samples from TW-1, TW-2 and TW-8 for analysis of PAHs, RCRA-8 metals, pesticides, and herbicide to evaluate potential impacts from the former use of south-abutting lot for rail operations;
- Collection of two soil vapor samples (SG-1 and SG-2) from the former auto service area for VOC analysis;
- Survey of the temporary wells for elevation control to allow the calculation of groundwater contours and flow directions; and

- Collection of a sample of drummed well purge water and laboratory analysis for waste characterization parameters including VOCS, SVOCs; RCRA 8 metals, PCBs, pesticides, herbicides, total petroleum hydrocarbons, flashpoint, corrosivity (pH), and reactivity.

Resolutions to the identified data gaps, summarized below, were presented in Stantec's Limited Phase II ESA report:

1. Soil and groundwater testing in the area of the leach field (SB-1/TW-1 to SB-4/TW-4) did not indicate exceedances for VOCs, petroleum-derived contaminants, and metals. Although arsenic was detected in soil samples in this area, the concentrations did not exceed Vermont background levels for the metal and so this contaminant was not considered to be a Site-related contaminant of concern. No additional investigation of this data gap was recommended.

2. Soil and groundwater testing at the SB-5/TW-5 to SB-8/TW-8 locations, and the SS-1 and SS-2 locations did not indicate exceedances for VOCs, petroleum-derived contaminants, or metals. Although elevated arsenic levels were detected in soil samples in this area, the concentrations did not exceed Vermont background levels for the metal and so this contaminant was not considered to be a Site-related contaminant of concern. No additional investigation of this data gap was recommended.

3. Soil and groundwater testing at the SB-1/TW-1, SB-2/TW-2, and SB-8/TW-8 locations did not indicate exceedances for VOCs, metals, pesticides, and herbicides. Although elevated arsenic levels were detected in soil samples in this area, the concentrations did not exceed Vermont background levels for the metal and so this contaminant was not considered to be a Site-related contaminant of concern. No additional investigation of this data gap was recommended.

4. Soil vapor testing at the SG-1 and SG-2 locations did not indicate exceedances for VOCs at these locations, suggesting a lack of the potential for vapor intrusion into the Yellow Barn building. No additional investigation of this data gap was recommended.

Although Stantec's Phase II subsurface investigation of the leach field area did not indicate impacts to soil or groundwater above Vermont standards, previous septic effluent sampling data indicates that heavy metal contamination may be present, and additional investigation is warranted. Therefore, this issue is addressed in this CAP.

Similarly, although the detected PAH concentrations in SS-1 and SS-2 soil samples did not exceed VSLs, the elevated laboratory reporting limits for these samples were above associated VSLs, and so represent a data gap. Therefore, this issue is also being addressed in the CAP.

The laboratory reporting limits of several VOCs in soil and soil gas samples exceeded applicable Vermont standards. This lack of reporting limits below standards for these compounds did not represent a significant data gap and these compounds were not considered to be contaminants of concern for the Site and are therefore not addressed in this CAP.

2.3 CURRENT USE OF SITE AND ADJOINING SITES

Although the Site is developed with several structures as described in Section 2.1, the Site is not currently in active use apart from the use of the eastern portion of the Site by Lamoille Valley Ford for the storage of new cars; the use of the Yellow Barn for the storage and selling of miscellaneous goods (furniture, clothes, outdoor equipment, etc.) during advertised barn sales; and the use of the western portion of the Site for snowmobile trailhead parking.

Current uses of adjoining properties are as follows:

- North: VT Route 15 with (west to east) undeveloped land, a residence, and the Lamoille Valley Ford dealership beyond. Hardwick Lake is located to the north and the dam for Hardwick Lake is a few hundred feet north of the Site;
- East: VT Route 15 with Lamoille Valley Ford dealership and a used car lot;
- South: Former railroad right-of-way with the Hardwick Wastewater Treatment Plant (WWTP) beyond; and
- West: Wright Farm Road with the Lamoille River and agricultural land beyond.

The Site and vicinity layout, along with an area parcel map, are provided on **Figure 3**. Notifications to neighboring parcels prior to CAP implementation is presented in Section 4.

3.0 SITE CONCEPTUAL MODEL

A Conceptual Site Model (CSM) is a representation of the physical, chemical, and biological processes that control the transport, migration, and actual and potential impacts of contamination (in soil, air, groundwater, surface water or sediments) to sensitive receptors. The following CSM is based on information provided in the REA Phase I/II ESA reports, LEE Phase I ESA report, and Stantec's Limited Phase II report described previously. Please note that although these prior site investigations have not identified site media containing contaminants above applicable Vermont standards, since additional subsurface investigation is proposed as part of this CAP, a discussion of potential contaminants of concern has been provided.

3.1 POTENTIAL CONTAMINANTS OF CONCERN

Multiple known or potential contaminant sources were identified by REA, LEE, and Stantec as a result of the Phase I/II assessments completed at the Site between 2017 and 2019. These sources were largely a result of the past use of the Site for auto repair/maintenance, and documented releases of petroleum at the northeasterly-adjoining Lamoille Valley Ford Site. In addition, use of the south-abutting parcel as a railroad right-of-way represents another potential contaminant source.

Specific known or potential contaminant sources included the following:

- Possible subsurface contamination in the leach field area due to discharges from the septic tank that accepted, in addition to sanitary wastes, effluent from a former slop sink in the Yellow Barn. Prior sampling of the Site's septic tank effluent by REA indicated the presence of elevated levels of metals, notably arsenic, cadmium, and lead; however, these levels were compared to VGESs that are not applicable to septic effluent. Stantec's Limited Phase II ESA did not find that this potential source of contamination was of concern based on investigation findings, including media sampling. However, VTDEC does consider this issue a concern to be addressed as part of this CAP;
- Possible subsurface contamination from petroleum, solvents, and metals due to historical on-Site Site use (auto repair/maintenance). Release mechanisms include surficial releases and releases to floor drains that formerly discharged to the ground surface. Stantec's Limited Phase II ESA did not find that this potential source of contamination was of concern based on investigation findings, including media sampling. However, VTDEC does consider the issue of the elevated laboratory reporting limits for some of the tested PAHs for the SS-1 and SS-2 soil samples a concern to be addressed as part of this CAP;
- Potential subsurface contamination from petroleum, metals, pesticides, and/or herbicides due to former use of the south-abutting parcel as a former rail bed. Release mechanisms include aerial dispersion of pesticides and/or herbicides during their application as part of regular track maintenance; migration of PAH and metal-containing dust from the rail right-of-way to the Site via wind-blown particulates; and migration of PAHs, metals, pesticides, and/or herbicides from the rail right-of-way to the Site via overland flow. Stantec's Limited Phase II ESA did not find that this potential source of contamination was of concern based on investigation findings, including media sampling; and
- Potential soil gas contamination at the Site due to historic site use for auto repair/maintenance and from the northeasterly-adjoining Lamoille Valley Ford property. Stantec's Limited Phase II ESA did not find that this potential source of contamination was of concern based on investigation findings, including media sampling.

Since the only issues of concern remaining at the Site include metals in septic effluent and possible PAH impacts in the SS-1/SS-2 area, only these contaminants of concern will be carried forward in the following sections of the CSM.

3.2 CONTAMINANT FATE AND TRANSPORT

Contaminants of concern at the Yellow Barn Site include limited petroleum (PAHs) and metals. Petroleum, including PAHs, may be readily degraded in the environment through volatilization, microbial activity, and other naturally occurring physical and geochemical processes. These contaminants can dissolve in groundwater to varying degrees depending on their individual solubility characteristics. Solubility also affects adsorption and desorption on soils and volatility from aquatic systems, as well as a contaminant's transformation by hydrolysis, photolysis, oxidation, reduction, and biodegradation in water. More soluble compounds (such as benzene) are more likely than less soluble compounds (such as naphthalene) to leach from soil due to precipitation events and enter the groundwater. These contaminants may also volatilize from soil and groundwater into the atmosphere, and therefore can increase vapor intrusion risks. Groundwater flow directions at the Site have been determined by water level measurements in temporary wells. In addition, local topography generally slopes to the north or west, the Lamoille River is located nearby and to the west of the Site, and Hardwick Lake is located nearby and to the north of the Site. Based on these factors, shallow groundwater flow is inferred to be to the west and/or northwest (see **Figure 5**).

Since metals are elemental contaminants, they cannot be degraded; they can only be dispersed or transformed. Dispersion occurs through migration of dissolved metals with the advective flow of groundwater. Transformation between highly mobile and immobile forms of metals can be affected by reduction/oxidation (redox) potential. In addition, since these contaminants of concern are positively charged, they will be more likely to bind to soils with higher cation exchange capacities (such as clays or organic materials), thereby limiting the migration potential. Being non-volatile, they do not represent a vapor intrusion risk.

3.3 POTENTIAL RECEPTORS AND EXPOSURE PATHWAYS

The area surrounding the Site is a mix of residential, commercial, agricultural, and institutional uses. Area properties are serviced by the municipal water supply, whose source is the Bridgeman Hill Reservoir. Given the presence of the Lamoille River and Hardwick Lake, which are presumed to represent a discharge zone for local groundwater flow, between the Yellow Barn Site and Bridgeman Hill Road, it is not expected that contamination migrating from the Site, if any, is likely to impact the Hardwick municipal water supply located on Bridgeman Hill Road.

Groundwater flow data generated from the Phase II data indicates that the Lamoille River, which is located just to the west of the Site, is likely a discharge zone for shallow groundwater migrating from the Site. Although groundwater contamination at the Site was not indicated by Stantec's Limited Phase II ESA, potential contamination in groundwater at the Site could, and therefore, could impact the river. Dilution in the river would likely decrease to some degree any contaminant concentrations discharging to this surficial water body. In any event, given the lack of elevated concentrations of contaminants in groundwater at the Site, as shown by the Stantec's Phase II ESA results, the risk posed by the Site to the Lamoille River appears to be low.

The depth to groundwater at the Site has been estimated to be in the range of 7–13 feet. Shallow groundwater can pose a risk to potential receptors, such as utility workers or others who conduct excavations that intersect the water table. However, given the lack of elevated concentrations of contaminants in groundwater at the Site, as shown by Stantec's Phase II ESA results, the risk posed by the Site to utility or construction workers also appears to be low.

Similarly, surficial releases of contaminants at the Site could put Site workers or trespassers at risk of exposure. However, given the lack of elevated concentrations of contaminants in shallow soil at the Site, based on Stantec's Phase II ESA results, the risk posed by the Site to Site workers or trespassers appears to be low, but this could change based on the results of the soil sampling proposed for completion as part of this CAP.

4.0 PERFORMANCE STANDARDS/REMEDIAL ACTION OBJECTIVES

Based on a review of previous Site data generated, soil is the only on-Site media requiring corrective action. Both groundwater and soil vapor appear to show no impacts above applicable standards and therefore are not proposed for further consideration under this CAP.

4.1 ENVIRONMENTAL MEDIA STANDARDS

Standards that apply to the potentially contaminated media at the Site are listed below:

- Soil: Although the planned use of the Site is commercial and not residential, property zoning for the Site does allow residential development. Therefore, standards that will apply to this Site are the Vermont Resident Soil Standards as provided in Appendix A - § 35-APX-A1 of the VTDEC IRule.

4.2 COMPLIANCE POINTS

The compliance points used to characterize the soil, groundwater, and soil vapor at the Site during prior site investigations are shown on **Figures 3-5** of Stantec's Limited Phase II Report which was provided previously to VTDEC.

Stantec's rationale for the location and purpose of the proposed Phase II borings and wells was as follows:

Area of Concern	**Proposed Investigation**
Leach Field	Investigation of subsurface impacts resulting from discharges of effluent from the Property septic tank (four borings: SB-1/TW-1 to SB-4/TW-4)
275-gal Waste Oil AST with Staining	Investigation of potential subsurface releases of oil or hazardous materials (OHM) from interior waste oil aboveground storage tank with associated staining around the tank (one boring: SB-5/TW-5 on north exterior side of Yellow Barn)

Area of Concern	Proposed Investigation
Floor Crack with Staining	Investigation of potential subsurface releases of OHM through floor crack in former vehicle maintenance area (one boring: SB-6/TW-6 on south exterior side of Yellow Barn)
Former Waste Storage Area in East Portion of Storage Shed with Staining	Investigation of potential subsurface releases of OHM from former waste storage area in Storage Shed (two exterior borings [SB-7/TW-7 and SB-8/TW-8] and two surficial soil samples [SS-1 and SS-2] from stained area in Storage Shed interior)
Former Rail Bed Abutting Property to South	Investigation of potential subsurface releases of OHM from the former use of the south-abutting right of way for railroad operations. (three borings – use two Leach Field locations [SB-1/TW-1 and SB-2/TW-2] and southern Waste Storage Area location [SB-8/TW-8])
Vapor Intrusion Assessment	Investigation of potential vapor encroachment issues resulting from past Property use and off-site use of the adjacent Lamoille Valley Ford site (two sub-slab soil gas sampling locations [SG-1 and SG-2] in former auto repair area of Yellow Barn).

Additional sample locations proposed to be investigated as part of the CAP include the septic tank/leach field area and the SS-1/SS-2 area of the Site (see **Figure 4**). Compliance point sampling conducted during the implementation of the CAP is discussed further in Section 5.

4.3 REMEDIAL ACTION OBJECTIVES

The likely pathway of exposure to sensitive receptors is through direct contact with the soil on-Site. Removal of the septic system is planned in order to remove it as a continuing source of metals discharge to the Site. Furthermore, should the proposed sampling conducted in accordance with this CAP result in the identification of soil impacts exceeding Vermont standards, the off-Site disposal of the soils, along with the recording of an institutional control for the property as part of the Site's enrollment in the BRELLA program, will ensure that there are no completed exposure pathways that have the potential to result in exposure of sensitive receptors to Site-related contaminants.

5.0 CORRECTIVE ACTION PLAN

This section describes the elements comprising the CAP tasks, including the optional tasks which are dependent on the results of the initial soil sampling task.

5.1 EVALUATION OF CORRECTIVE ACTION MEASURES

This CAP is being submitted without a formal evaluation of corrective action alternatives (ECAA) in accordance with the exemptions listed in § 35-604(b) of the VTDEC IRule, as summarized below:

1. The site investigation report demonstrates that there are no impacts to drinking water sources, vapor intrusion is not occurring, and there are no other impacts that present a threat to human health;

   Response: The results from previous Site investigations indicate that no impacts exist to drinking water sources, soil vapor intrusion is not occurring at the Site, and no other known impacts presenting a threat to human health exist.

2. For impacted groundwater, the site investigation report demonstrates that the groundwater contamination is confined to the property where the release occurred on or will recede to the property boundary within the timeline established in the Vermont Groundwater Protection Rule and Strategy;

   Response: This exemption does not apply as impacted groundwater has not been identified at the Site.

3. Any direct contact threats to sensitive receptors can be addressed through removal of a limited amount of source material or capping with an engineered barrier;

   Response: Direct contact threats will be addressed through the removal of impacted soil and its off-site disposal;

4. A corrective action plan will document that the proposed remedy, with respect to the hazardous material in question, has been utilized at other sites and has been demonstrated to be reliable, cost effective, and effective in addressing remediation of the hazardous material.

   Response: Use of soil removal with off-site disposal has been used at other sites and demonstrated to be reliable, cost effective, and effective at mitigating impacts of materials similar to those at the Yellow Barn site; and

5. For Development Soil receiving sites, all requirements in §35-512 have been met, and a corrective action plan which addresses potential direct contact with development soils by the public, including capping and land use restrictions, has been approved by the Secretary.

   Response: This exemption does not apply as the Yellow Barn site is not a development soil receiving site.

5.2 PRELIMINARY SOIL SAMPLING

To address the VTDEC concerns regarding possible soil impacts from metals in the septic/leach field area and the elevated laboratory reporting limits for PAHs in soil samples from the SS-1/SS-2 area, Stantec proposes to collect additional soil samples for laboratory analysis to determine if, in fact, these areas are impacted by metals and/or PAHs, respectively, which will then inform the path forward regarding required remedial efforts.

5.2.1 Septic/Leach Field Area

Removal of the Site's septic tank and leach field effluent distribution piping will be completed to remove it as a future source of metals impact to the Site subsurface. Its removal is also a necessary part of the planned redevelopment of the Site as the Accelerator Building is proposed for construction in the vicinity of the leach field. Elements of this task include the following:

- Locating the subsurface infrastructure will be completed through the use of surficial geophysical methods such as ground penetrating radar or through the use of a backhoe.
- The contents of the septic tank will be pumped out by a qualified contractor. The material will be disposed of at a facility licensed to accept it, such as the Hardwick Sewage Treatment Plant (HSTP), which is located just south of the site. Based on information from the HSTP, it will be necessary to provide all available effluent quality data to them for review, and based on their review, additional sampling of the waste may be required for contaminants to be identified by HSTP. If required, sampling will be completed prior to the pumping of the tank.
- Removal of the tank and piping will be accomplished using a backhoe or excavator. The location of the excavation is shown on **Figure 7**. Excess soil adhering to the removed tank and piping will be brushed off back into the excavation. The tank and piping will be temporarily stockpiled on a minimum of two sheets of 6 mill polyethylene sheeting pending loading for off-site disposal as non-hazardous solid waste at a facility licensed to accept it.
- Silt fence is proposed for installation around the perimeter of the site development area to prevent any potential run-off or erosional impacts to the surrounding properties. The location of the silt fence is shown on **Figure 7**. Installation of catch basin protection and construction of a stabilized construction entrance will also be completed (see also the Erosion Control Notes and details on **Figure 9** for further requirements of the Contractor as it relates to erosion and sediment control).
- If excessive dust is generated during the excavation process, misting will be used for dust suppression.
- While the current location of the leach field pipes is uncertain, it is assumed that three lines extend roughly east to west and are spaced roughly 30 ft. apart, each having a length of approximately 150 ft. The size of the septic tank has been reported to be 1,000 gallons based on the previous use of the building. The following protocol will be used to select the locations of soil samples collected for analysis from the septic system:
    - One grab sample will be collected from the soil immediately below the septic tank;
    - Four grab samples will be collected from the tank excavation sidewalls, with one of these collected immediately below the point where the discharge pipe from the septic tank exits the tank;

- One grab sample will be collected from the soil immediately below the discharge piping at a rate of 1 sample per 10 linear feet of piping;
- If any evidence of discharge from leaking joints in the discharge piping is observed, one grab sample will be collected from the soil immediately below the leaking joint; and
- Soil samples will be analyzed for arsenic, cadmium, and lead only using EPA 6000/7000 Series Methods.

5.2.2 SS-1/SS-2 Area

Soil samples in the SS-1/SS-2 area that had PAH laboratory reporting limits above applicable Vermont standards included the following locations: SS-1 (0-0.5'), SS-1 (3-3.5'), and SS-2 (0-0.5'). Therefore, these locations and sample intervals will be re-sampled (as close as can be achieved). The samples will be analyzed for PAHs using EPA Method 8270 SIM so that reporting limits are below Vermont soil standards.

5.2.3 Quality Assurance/Quality Control (QA/QC) Samples

QA/QC samples, including field duplicates, equipment blanks, trip blanks, and matrix spike/matrix spike duplicates, will be collected and analyzed in accordance with the QAPP (Stantec, 2018). If soil sampling equipment requires decontamination between sample collection, one equipment rinsate blank will be collected during the field investigation. One water blank will also be collected from the water used for decontamination procedures. If dedicated or disposable sampling equipment is used and decontamination is not applicable, then equipment and water blanks will not be collected.

5.2.4 Investigation-Derived Waste

Assuming all generated soil cuttings and decontamination water (if any) does not display evidence of contamination (presence of free product, strong odors, staining), these investigation-derived wastes will be disposed of on-site in a manner that does not promote ponding, erosion, or off-site migration. Should evidence of contamination be observed, however, Stantec will consult with the VTDEC regarding the need for containerization in labeled 55-gallon open top drums and characterization for off-site disposal.

5.3 DATA EVALUATION

Following the completion of the proposed soil sampling, the data will undergo Stantec's internal QA process per the QAPP and will be evaluated to determine whether any detected concentrations exceed applicable Vermont Soil Standards. Depending on the findings of that evaluation (are there exceedances or not), the need for further remedial efforts will be determined. Possible outcomes of the data evaluation include:

1. Data quality is sufficient for acceptance of all data and no detected concentrations exceed Vermont Soil Standards.

   Outcome: No further action required regarding site remediation.

2. Detected metals and/or PAH concentrations exceed Vermont Soil Standards.

   Outcome: Further action required regarding site remediation to prevent possible exposure of potential receptors to site contaminants

Further discussion of the implementation of Remedial Option #2 is provided below.

5.4 REMEDIAL CONSTRUCTION PLAN

5.4.1 Impacted Soils

Remedial Option #2 (off-site soil disposal/IC) is designed to reduce the risk of a complete exposure pathway to local residents, Site workers, or users of the redeveloped Site. To effectively manage soils determined to be impacted above Vermont Soil Standards in an environmentally friendly fashion, it is proposed to dispose of the soils at a local facility, such as Coventry Landfill, that is certified to accept non-hazardous soils. Under this option, an estimated 75 cubic yards of soil are presumed to require off-Site disposal. Recording of an IC will also be completed as part of the site's enrollment in BRELLA.

5.4.2 Non-impacted Soils

Site grading for redevelopment is anticipated to occur across a majority of the western and central portions of the Site. It is anticipated that while these soils are expected to be non-impacted ("clean"), the soil will have to be removed in most of these areas due to poor geotechnical properties or to achieve desired grades. Clean fill will be imported into these areas for backfill, as required. It is assumed that one foot of soils must be removed from areas of the Site covered with a concrete slab (e.g. building floor slab, concrete vault, sidewalks, dumpster pad, etc.) or asphalt paving (parking lot areas). Further excavation to varying depths will also be required for Site civil enhancements including stormwater catchment and drainage structures and associated piping, building footings and pylons, access vaults, loading docks, lighting, and other development improvements. This equates to approximately 4,465 CY of non-impacted soil generated as a result of Site redevelopment (including a 30% contingency due to the preliminary nature of the redevelopment design). Costs to manage non-impacted soil are not addressed.

Non-impacted excavated soils will be sampled in accordance with the Town's chosen disposal location: either a Town-owned sand and gravel pit property or a VTDEC-permitted disposal facility such as Coventry Landfill. If the soil is disposed of at a Town-owned gravel pit property, sampling of the soil will be completed to confirm that the soil contains no contaminants at elevated levels that could potentially impact the disposal site. Sampling of the disposal site itself (soil, groundwater) may also be completed to confirm that the soil storage location is not contaminated prior to the soil's placement there. If the soil is disposed of at a local non-hazardous landfill, the soil will be characterized per the requirements of the landfill. The sampling results will be used to create a soil profile for submittal to the landfill for their review and acceptance. . Further information regarding soil characterization is provide in Section 7. Figure A.01-Schematic Grading Plan in **Appendix B** presents a Preliminary Schematic Site Grading Plan which provides insight into what areas will be graded to create the proposed final grade at the Site.

5.5 CONTAMINATED WATER AND SOIL MANAGEMENT PLAN

This section outlines management of known or potentially impacted water and soils generated as part of Site redevelopment. A project schedule is presented in Section 13. Plans for Redevelopment of the Site are presented in **Appendix B**. A list of proposed Contractors is presented in Section 15.

5.5.1 Water

Excavation dewatering is not anticipated during CAP implementation since the maximum anticipated depth of excavation is approximately six ft. bgs to remove the septic tank and leach field piping. Depth to groundwater was 6.84 ft. bgs in TW-3 during Stantec's Phase II ESA. Site grading activities for redevelopment are also not anticipated to encounter groundwater.

During construction, all surface water runoff and construction dewatering shall be managed in accordance with the approved Site plans. Use of sediment barriers and other best management practices for stormwater will be implemented to limit the downstream discharge of sediment-laden water to surface waters and adjoining parcels.

If the pre-construction sampling conducted as described in Section 5.2 determines that metals impacts to soil are present in the leach field area, in the unlikely event that groundwater or contact stormwater accumulates within an excavation in the leach field area prior to removal of the soil for off-site disposal, it will be assumed potentially contaminated with metals. Groundwater encountered in other areas of the Site will be assumed to be non-impacted. The management of the excavation water must be conducted under the supervision of a qualified environmental professional (EP). The Contractor will collect, handle, filter, or otherwise treat, as necessary, and properly dispose of contaminated water removed as needed for project construction, including stormwater that has contacted the leach field area (not including any diversion swales). Management of impacted water generated during project development activities must include characterization (sampling and laboratory analysis) as required to obtain approval from the municipal sewer authority for sewer discharge (if available) or approval from an off-Site disposal facility. A temporary sewer use permit may also be required from the local municipality prior to discharge of containerized water should the Contractor choose to dispose of water to the municipal sewer (if available).

Appropriate measures for management of impacted water must include temporary containerization and measures to prevent water from contaminating other materials or migrating off-Site. Measures that must be incorporated include:

- Containerize water prior to pumping or transport off-Site;
- Stage containers away from drainage sources;
- Pump water directly into containers;

- Perform necessary sampling prior to disposal per disposal facility requirements; and
- Coordinate with the municipal sewer district or alternate facility to receive permission for disposal.

Any water collected as part of this task will be disposed of in accordance with all Federal, State, County, and local regulations.

5.5.2 Soil

Assuming that the results of the proposed CAP soil sampling show metals impacts in the septic/leach field area and/or PAH impacts in the eastern area of the shed, contaminated soils will require management during CAP implementation and Site redevelopment. Fill soils overlying the septic system components and the impacted soil strata will be excavated, stockpiled, and eventually returned to the excavation in the same general strata from which they were removed. Management strategies for excavated soils determined to be impacted are presented below.

5.5.2.1 Soil Staging

Excavated soil will be placed on and covered by poly sheeting with a minimum thickness of 10-mil. Both the liner and the cover must overlap a continuous perimeter berm and must be securely weighted or otherwise anchored to prevent them being blown off the soil pile. The bottom liner will be placed on a subgrade prepared by removing large rocks and other debris that could cause a puncture. In addition, the first material placed in the stockpile will be screened for large objects to avoid puncturing the liner. These stockpiles will be kept covered at all times and only uncovered when in active use. The stockpile area will be graded to divert stormwater around the piles and will be located to present a minimum of interference with construction operations. Stockpiles will be inspected at a minimum of once each week and after every storm event. Stockpile construction details are included on **Figure 9**.

5.5.2.2 Off-Site Soil Disposal

Off-Site disposal of impacted soils is anticipated to entail characterization of the soil per disposal facility requirements, preparation of a waste profile and its submittal to the disposal facility for review and acceptance, loading and transport of the soil, and its disposal at a permitted non-hazardous facility. It is anticipated that any soil waste generated will meet the requirements of a local non-hazardous for use as alternative daily cover.

It is anticipated that any impacted soil will meet the requirements of a local non-hazardous facility for use as alternative daily cover.

Waste haulers must be appropriately licensed and trucks properly placarded. If loads contain wet material capable of producing free liquid, truck liners will be used. Truck transport routes must be the most appropriate routes and take into account: (a) use of city mapped truck routes; (b) prohibiting off-Site queuing of trucks entering the facility; (c) promoting safety in access to highways; and (d) overall safety in transport. Stopping and idling or trucks in the vicinity of the project Site must be minimized to the extent possible. Egress points for truck and equipment transport from the Site must be kept clean of dirt and other materials during Site development. Queuing must be performed in a manner that minimizes off-Site disturbance.

5.5.3 Ambient Air Monitoring

Excavated soils have the potential to generate airborne particulates which will be actively addressed during CAP implementation. Ambient air monitoring will consist of visual monitoring with attention being paid to the most sensitive receptors (downwind parcels as presented in **Figure 3**). If visual inspections indicate off-Site migration of particulates is excessive and at annoyance levels, dust suppression techniques will be implemented by the Contractor including, but not limited to, applying water to Site haul roads, decreasing on-Site vehicle speeds, covering soils with waterproof barriers to prevent dust migration, limiting work during high wind events, and/or ceasing work activities until dust migration is ceased. Work may continue with dust suppression techniques provided that visible dust migration has ceased. Dust suppression chemicals other than water shall not be used on the Site.

5.5.4 Other Waste Materials

Other waste materials generated at the Site will likely include non-hazardous solid waste from Contractor operations, used PPE, and poly sheeting from stockpile deconstruction. It is the responsibility of the Contractor to properly dispose of these wastes in accordance with Federal, State, County, and local regulations. It is anticipated that these wastes will be disposed of in a local, permitted, non-hazardous landfill.

The excavated septic tank and associated leach field piping are also proposed to be disposed of as non-hazardous waste following removal of soils adhering to the appurtenances as described previously.

6.0 PUBLIC NOTICE

Based on the potential for there to be metals and/or PAHs in shallow soil at the Site, the exposure pathways of nearby property owners (as a trespasser) include surface soil contact. As described previously, the risk of actual exposure to contamination via these exposure pathways is low under current conditions based on the results of Stantec's Phase II ESA which did not indicate elevated concentrations of contaminants in soil at the Site above applicable standards and also do not appear to indicate a potential for vapor intrusion based on the VES. Given the lack of elevated concentrations of contaminants in soils on the Site, neighboring property owners are not likely to be impacted by the implementation of the CAP. There exists a small possibility that work activities on the Site will generate particulate matter (dust) capable of migration off-Site if the correct environmental conditions exist. Refer to Section 5.5.3 for mitigation measures taken to reduce off-Site impacts of particulates.

Per the VTDEC IRule, neighboring property owners to be given a notice of the CAP are listed in **Table 2**, below.

Table 2: Adjoining Parcel Contact Information

Parcel Owner Name	Contact Information	Parcel Address	Parcel Number
Hardwick Electric Department	P.O. Box 516 Hardwick, VT 05843 (802) 472-5201	-*	05034-00000
Marcy Margaret Rev Living Trust	4771 Baywood Pt. South Gulfport, Fl 33711	294 VT Route 15 West Hardwick, VT 05843	09012-00010
Lamoille Valley Holdings, LLC	P.O. Box 308 Hardwick, VT 05843	278 VT Route 15 West Hardwick, VT 05843	09012-00030
Daniel Keene	P.O. Box 308 Hardwick, VT 05843	222 VT Route 15 West Hardwick, VT 05843	09012-00040
Town of Hardwick	P.O. Box 523 Hardwick, VT 05843 (802) 472-6120	-*	21001-00000
Jack D. Merrill C/O Lori Gaskell	18 October Hill Oak Ridge, NJ 07438 (973) 697-2134	-*	09008-00000
154 Route 15 West LLC	P.O Box 1250 Hardwick, VT 05843	154 VT Route 15 West Hardwick, VT 05843	21004-00000

***Note:** Some parcel data was unable to be obtained from readily available public sources. Email addresses were also unable to be obtained from readily available public sources for the listed parcels.

The neighboring parcels notified of the CAP are shown in **Figure 3**. A draft notification letter to neighboring parcel owners is included in **Appendix A**.

7.0 DURATION OF REMEDIATION AND SUBSTANTIAL COMPLETION

Duration of the CAP implementation will be based on the chosen Contractor's schedule and is subject to change based on a number of factors. An anticipated project schedule is presented in Section 13.

Substantial completion of the project will be identified once Site redevelopment has occurred and engineered barriers have been installed across the Site in the proposed locations as shown on **Figure 8**. The proposed engineered barriers will reduce the potential for exposure and no long-term environmental monitoring will be required for the Site. Institutional and engineering controls will be installed at the Site to prevent degradation and decay of the Site cap and document its effectiveness. Further details regarding monitoring the integrity of the Site's cap is included in Section 9.

8.0 PERMITS

To remain compliant with Federal, State, County, and local regulations, it is anticipated that multiple permits will be required in order to perform CAP implementation. The following permits will likely be required:

- **Federal**: No Permits Expected.
- **State**: Stormwater General Permit, Stormwater Individual Permit Wetland Permit, VTrans Permit, Building Permit, Discharge Permit.
- **County**: No Permits Expected.
- **Local**: Zoning Permit.

It is worth noting that additional permits may be required for other portions of the redevelopment at the Site. I t will be the responsibility of the Contractor to secure and keep required permits current to complete their scope of work.

A public utility locate has already been completed on the Site. Prior to intrusive work at the Site during CAP implementation, a new utility stakeout shall be performed in accordance with State regulations. This utility locate will be the responsibility of the chosen Contractor.

In addition to a public utility stakeout, a private utility locater using ground-penetrating radar (GPR) or other approved method shall be completed prior to excavation of the septic tank and leach field piping to more effectively locate the system components and reduce disturbance of surrounding soils. Exploratory test pits may also be conducted by the Contractor to supplement or in lieu of using a private utility locater.

9.0 OPERATION, MAINTENANCE, AND LONG-TERM MONITORING PLAN

As the selected remedial option does not include the installation of engineered barriers of remedial systems, regular Operations and Maintenance (O&M) activities are not required. Also, a Long-Term Monitoring Plan is also not required.

10.0 REPORTING REQUIREMENTS

As required by Section § 35-608 of the IRule, a Corrective Action Construction Completion Report will be prepared within 90 days of completing the capping remedy. The report will include all information required by the IRule including the necessary certification.

11.0 INSTITUTIONAL CONTROL PLAN

Since no engineered barriers or remedial systems are part of the selected remedy, use of an institutional control will not be required for this remedial effort.

12.0 REDEVELOPMENT AND REUSE PLAN

Redevelopment of the Site is anticipated to take place concurrently with the implementation of the CAP and portions of the proposed redevelopment will also serve as an element of this CAP (e.g. removal of the septic system). As such, preparation of this CAP has included input from Coe + Coe Architecture of West Glover, Vermont, the firm responsible for redevelopment and reuse plans at the Site. As stated in Section 2.1, the Site owner, 1781 Group LLC, plans to sell the Site to the Town of Hardwick.

The Town of Hardwick, in cooperation with NVDA and the Vermont Center for an Agricultural Economy, plans to redevelop the Site as the Yellow Barn Business Accelerator Project that includes renovation of the existing Yellow Barn with one first-floor commercial tenant space and the construction of a new Accelerator Building on the Site west of the barn. The Accelerator Building will include additional tenant spaces anchored by The Cellars at Jasper Hill, a cheese aging and distribution operation. Also, as part of the redevelopment, the existing storage shed and breezeway are to be demolished and the existing septic tank and leach field piping are to be excavated and removed. Foundation installation for the proposed building will likely include excavation of existing Site soils and ground improvements to provide structural stability for the building's finished concrete floor slabs. Ground improvements will likely include compacted stone columns, to a depth of 4 feet bgs. Significant fill will likely be required on the western portion of the new building slab to bring the existing ground surface to grade. Further improvements to the Site include multiple infrastructure improvements including stormwater catchment and drainage structures, access vaults, loading docks, increased parking with asphalt concrete pavement, lighting, and other community improvements. Preliminary redevelopment plans from Coe + Coe are included as **Appendix B.**

13.0 QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC) PLAN

Several methods are employed to monitor the validity and accuracy of the data generated and technologies used for this corrective action. These include construction Contractor documentation and third-party verification by a QEP of the implementation of the CAP. During construction, when the QEP is on-Site, they will prepare a daily log. This daily log will include the following: a description of the activities completed that day, weather, list of personnel on-Site, field observations/readings and instrument calibration data, and inspection of the temporary materials stockpile(s). If deficiencies were noted during inspections, the correction(s) made to address the deficiency will be noted. Also, the daily logs will include any deviations from the CAP and justification for any deviations. These daily logs will be submitted to the VTDEC upon request. The construction Contractor will maintain a logbook for tracking approximate soil volumes (i.e. number of truck loads) excavated and the qualified designated location. Also, a QEP will verify implementation of this CAP and document it in a Corrective Action Completion Report. The QEP will perform environmental construction inspections and document activities appropriately.

Standard operating procedures (SOPs) appropriate to the technologies being proposed for this corrective action include the manufacturers' SOPs for calibration, operation and maintenance (O&M) of the real-time field instruments. A calibration program will be implemented to ensure that calibration is performed daily unless manufacturer's instructions indicate differently. Calibration records for each instrument used on the Site are to be maintained in the project folder and available at the VTDEC's request.

13.1 QUALITY ASSURANCE / QUALITY CONTROL (QA/QC) SAMPLES

QA/QC samples, including field duplicates, equipment blanks, trip blanks, and matrix spike/matrix spike duplicates, will be collected and analyzed in accordance with the QAPP (Stantec, 2018). If soil sampling equipment requires decontamination between sample collection, one equipment rinsate blank will be collected during the field investigation. One water blank will also be collected from the water used for decontamination procedures. If dedicated or disposable sampling equipment is used and decontamination is not applicable, then equipment and water blanks will not be collected.

Laboratory QA/QC samples, including a method blank (a sample of lab reagent water that is known to be contaminant free), will be used in each QC batch to verify that the analytical procedure is free of contaminants. Matrix spike/matrix spike duplicate (MS/MSD) samples, which are aliquots of spiked laboratory reagent water, will also be analyzed to determine precision and accuracy.

13.2 STANDARD OPERATING PROCEDURES

Stantec will utilize the following standard operating procedures during the completion of this CAP as required. Copies of these SOPs are included in **Appendix D**:

Table 4: List of Standard Operating Procedures

SOP Code	SOP Description
ES-RR&IH-001	Soil Sampling
ES-RR&IH-002	Decontamination Procedures
ES-RR&IH-008	Waste Sampling
ESPA-011	Field Notebook
10.9	Chain of Custody Procedures

Note: SOP Codes are from Stantec's Quality Assurance and Project Plan documents.

14.0 IMPLEMENTATION SCHEDULE

This CAP is being prepared in advance of detailed Site design and the start of redevelopment of the Site. As such, anticipated schedules are subject to change based on chosen Contractor(s) schedules and a multitude of other factors. Currently it is anticipated that bid documents for the project will be available in March 2020. It is anticipated that the contract will be awarded in May 2020 with the project estimated to be completed within one year following award, in May 2021.

15.0 OPINION OF PROBABLE COST

An opinion of probable cost (OPC) for implementation and completion of the CAP is included in **Appendix E**. The OPC includes professional services and construction costs related to CAP implementation and reporting and is strictly for planning purposes. Assumptions related to the generation of the OPC are presented within the appendix. The OPC may vary based on final Site design, actual implementation schedule, and field conditions encountered during construction.

16.0 PROPOSED CONTRACTORS

A list of currently known Site Contractors is listed in **Table 5**, below. Contractors are subject to change based on availability and scheduling requirements. At the time of submission of this CAP, the project had not been bid out to Contractors. As such, the project, including CAP implementation, has not been awarded to a Contractor.

Table 5: **Proposed Corrective Action Plan Contractors**

Work Description	Firm Name	Location	Phone Number	Email (if available)
Building and Site Design	Coe + Coe Architecture	West Glover, VT	(802) 673-4184	james.n.coe@gmail.com
Site Grading	TBD	-	-	-
Paving	TBD	-	-	-
Concrete Foundations	TBD	-	-	-
Erosion and Sediment Control	TBD	-	-	-
Septic and Leach Field Excavation	TBD	-	-	-
Soil Sampling and QEP Construction Oversight	Stantec Consulting Services, Inc.	Auburn, NH	(603) 206-7553	Dave.Allwine@stantec.com

Note: Additional Contractors may be required to complete the Site redevelopment and CAP implementation that are not listed.

17.0 REFERENCES

LE Environmental, 2018. Phase I Environmental Site Assessment Report/Tier 1 Vapor Encroachment Screening Report, Yellow Barn Business Accelerator Project, 281 Vermont Route 15 West, Hardwick, Vermont. September 28.

Ross Environmental Associates, Inc., 2017. Phase I Environmental Site Assessment Report, 281 VT Route 15, Hardwick, Vermont 05843. September 22.

Ross Environmental Associates, Inc., 2018. Septic Tank and Soil Sampling & Analysis Report, Former Greensboro Garage/Yellow Barn, 281 VT Route 15, Hardwick, Vermont. January 9.

Stantec Consulting Services, Inc,.2019, Limited Phase II Environmental Site Assessment, The Yellow Barn Site, 281 VT Route 15 West, Hardwick, VT 05836

U.S. Environmental Protection Agency (USEPA). 2016. Regional Screening Levels. May 2016.

Vermont Department of Environmental Conservation (VTDEC). 2018. Groundwater Protection Rule and Strategy. Amended July 11, 2018.

VTDEC. 2019. Investigation and Remediation of Contaminated Properties Rule. Amended July 6, 2019.

FIGURES

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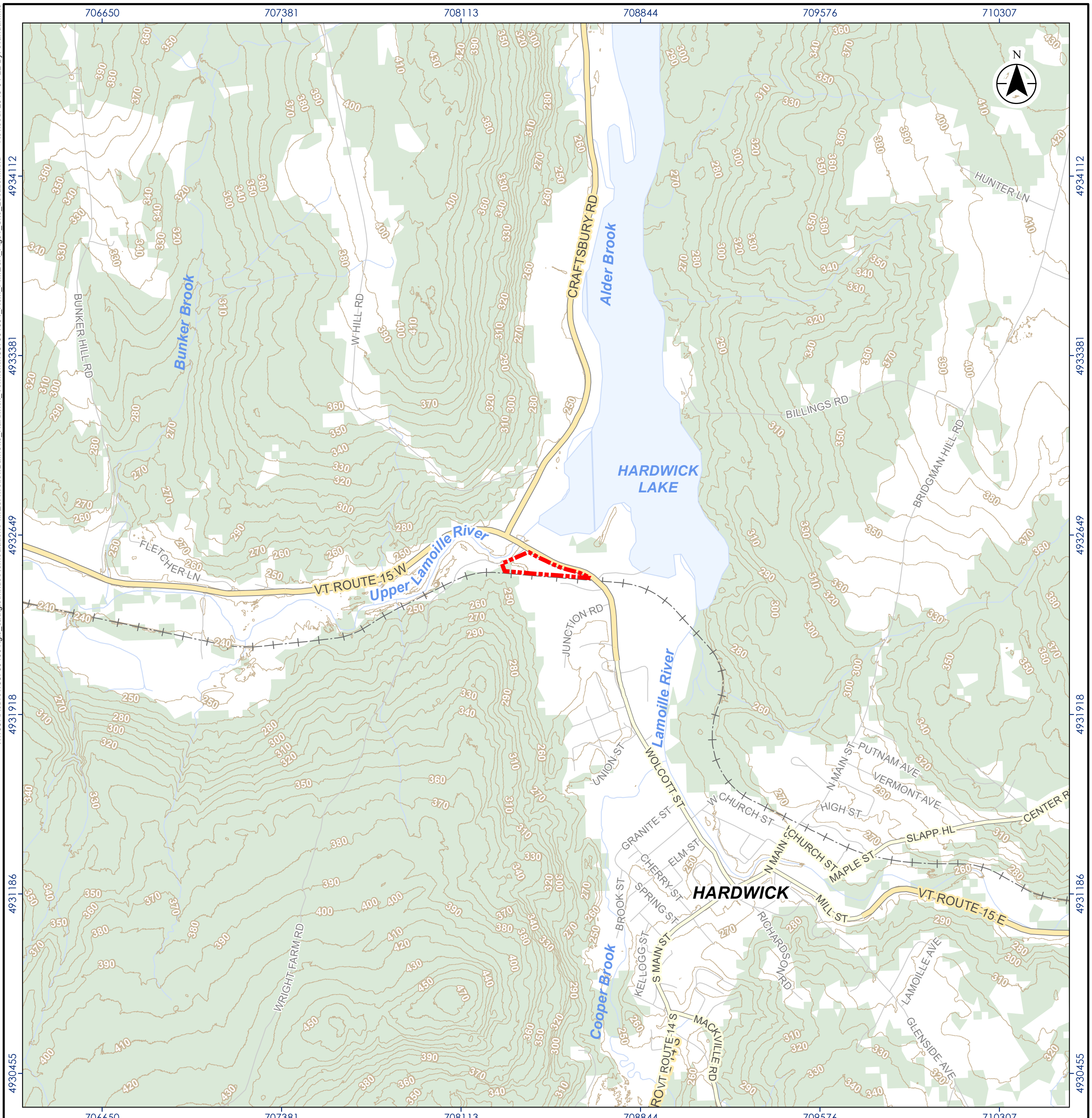
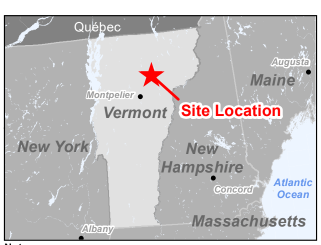




Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced by Vermont Open Geodata Portal, http://geodata.vermont.gov/pages/imagery. Accessed April 21, 2019.
3. This figure is to be viewed in the context of the accompanying report and is subject to the limitations specified in that report.

Legend

- Approximate Site Boundary
- Expressway / Highway
- Major Road
- Minor Road
- Former Railway
- Topographic Contour (ft)
- Watercourse
- Waterbody
- Wooded Area

0 1,000 2,000 Feet

1:24,000 (at original document size of 8.5x11)

Stantec

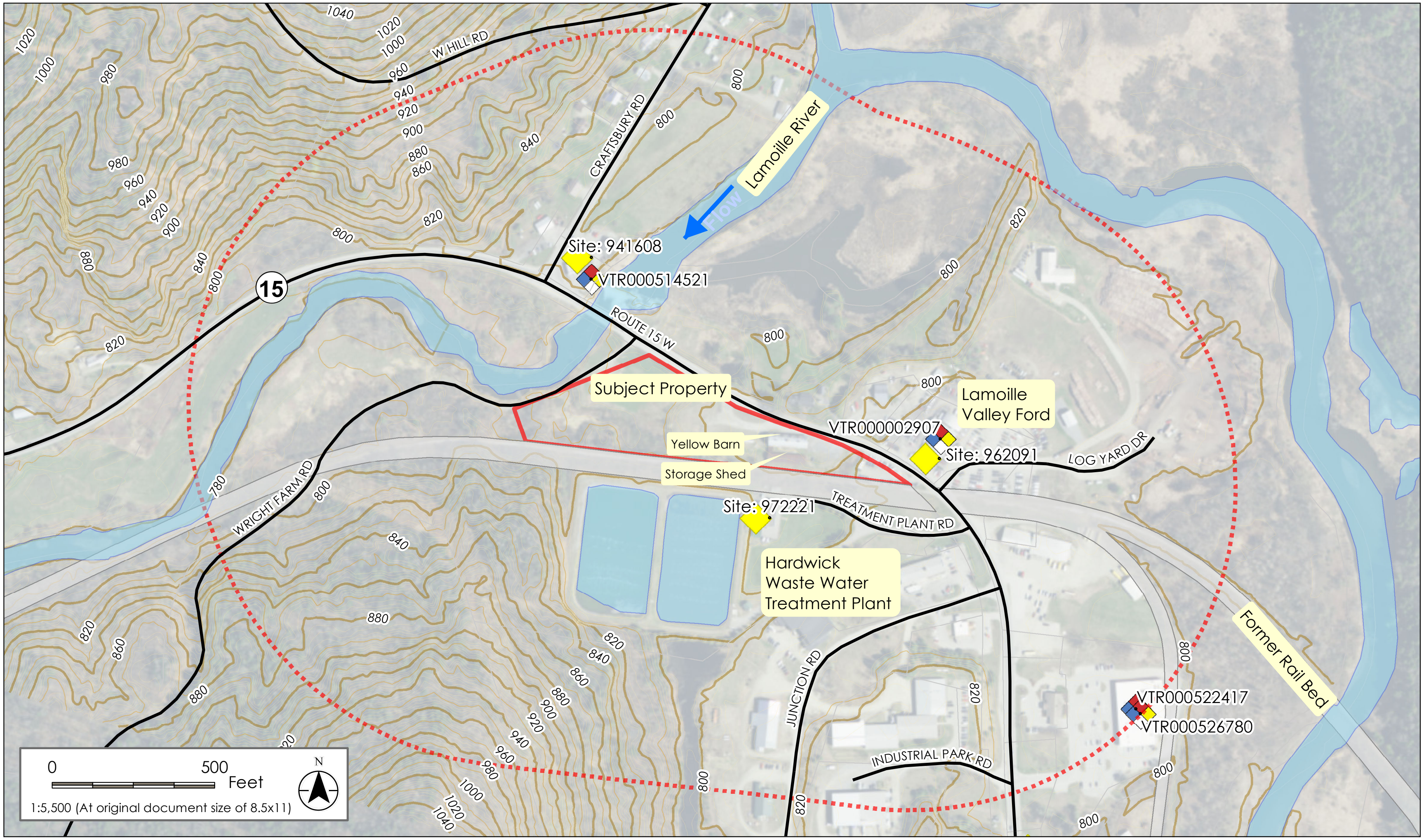
Project Location
281 VT Route 15 West
Hardwick, Vermont

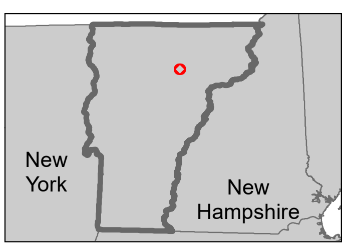
1857501001 REVA
Prepared by KTS on 8/8/2019

Client/Project
Northeastern Vermont Development Association
Corrective Action Plan
Yellow Barn Site, Hardwick, Vermont

Figure No.
1

Title
Site Location Map





Hazardous Waste Site

Hazardous Waste Generators

Former Rail Bed

Subject Parcel

1000' Buffer

Parcel Boundary Contour

Interval = 2ft.

Service Layer Credits: Vermont Agency of Natural Resources online Natural Resource Atlas, Waste Management Theme. Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
VTANRGIS

Stantec

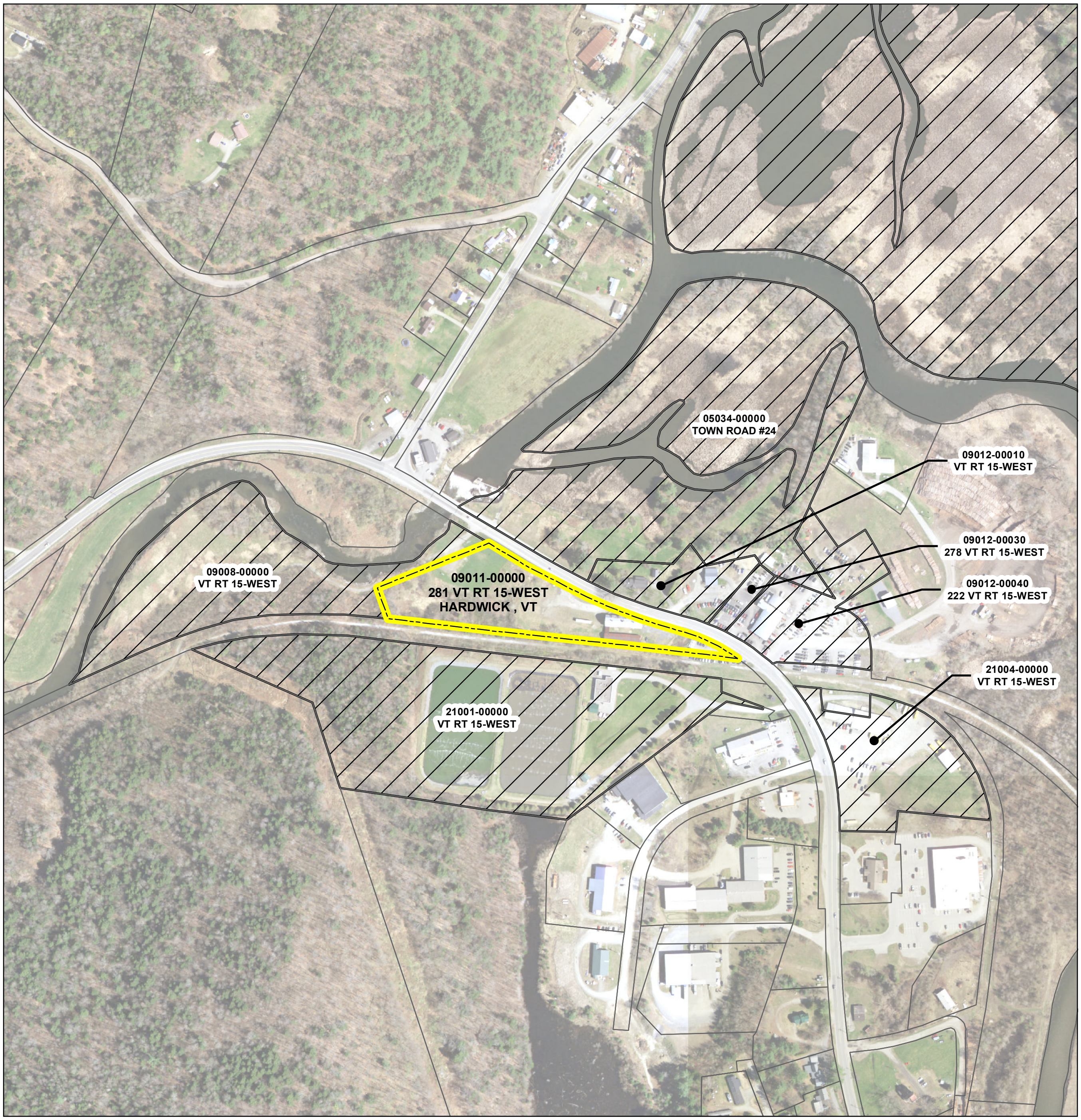
Project Location
281 VT Route 15 West
Hardwick, Vermont

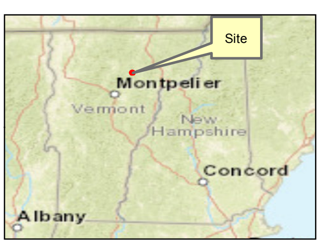
1857501001 REVA
Prepared by KTS on 8/8/2019

Client/Project
Northeastern Vermont Development Association
Corrective Action Plan
Yellow Barn Site, Hardwick, Vermont

Figure No.
2

Title
Vicinity Map





Legend

Site

Adjacent Parcels

Vemont Parcels

0 500 1,000 Feet

(At original document size of 8.5x11)
1:6,000

N

Notes
1. Coordinate System: NAD 1983 StatePlane Vermont FIPS 4400
2. Data Sources:
3. Background: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Stantec

Project Location
281 VT Route 15 West
Hardwick, Vermont

Prepared by APL on 2019-08-08
TR by KS on 2019-08-08
IR Review by KI on 2019-08-08

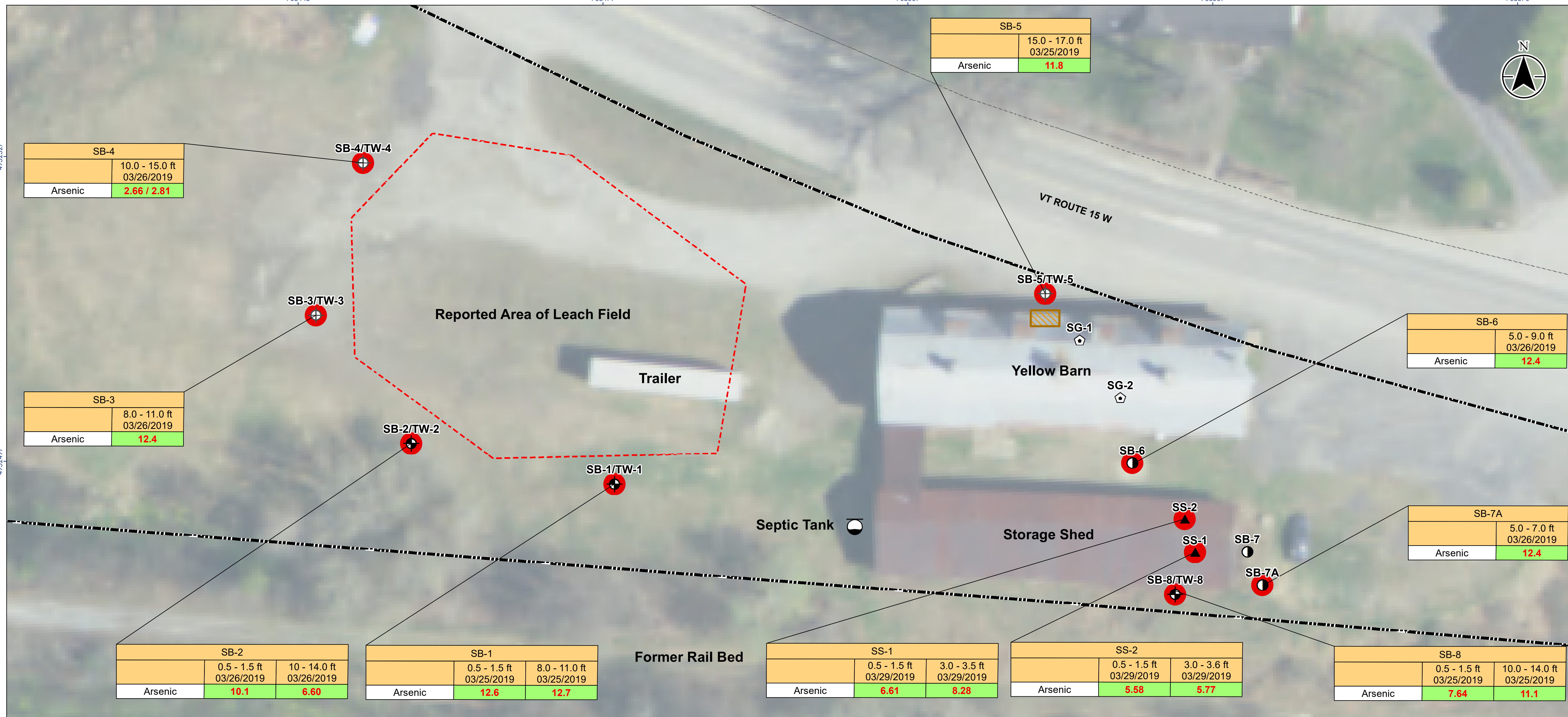
Client/Project
1857501001 REVA
Northeastern Vermont Development Association
Corrective Action Plan
Yellow Barn Site, Hardwick , Vermont

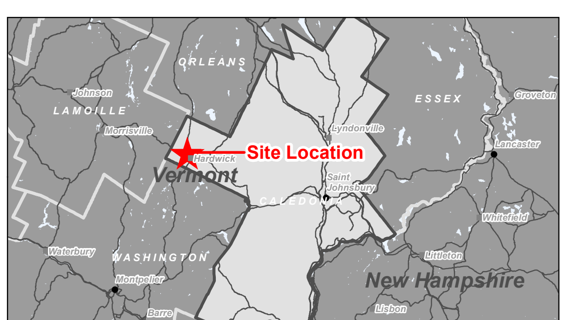
Figure No.
3

Title

Neighboring Parcels

Us1275-f02\workgroup\1905\temporary\Yellow Barn VT Corrective Action Plan\01_Figures\Drawings from Coe and Coe\GIS Shapefile\mxd\Figure 3 Adjacent Parcels.mxd Revised: 2019-08-08 By: aless





Legend
- Soil Boring
- Soil Boring/Temporary Well
- Soil Boring/Temporary Well with Shallow Soil Sample
- Soil Gas Point
- Surfical Soil Sample
- Septic Tank
- Detected Soil Concentrations Exceed EPA Regional Screening Levels - Industrial
- Approximate Site Boundary
- Reported Area of Leach Field
- Waste Oil AST
- Parcel Boundary
- Concentration Exceeds EPA RSL Industrial Soil

Location ID — Sample Depth (feet)/ Sample Date

SB-4	
	10.0 - 15.0 ft 03/26/2019
Arsenic	2.66 / 2.81

Parameter — Concentration Exceeds Guidelines — Original/Field Duplicate

0 20 40 Feet

1:400 (At original document size of 11x17)

		USEPA RSL	
Parameter	Units	Residential	Industrial
Arsenic	mg/kg	0.68	3.0

Stantec

Project Location
281 VT Route 15 West
Hardwick, Vermont

185750101 REVA
Prepared by KTS on 8/8/2019

Client/Project
Northeastern Vermont Development Association
Corrective Action Plan
Yellow Barn Site, Hardwick, Vermont

Figure No.
4

Title
Summary of Soil Analytical Results

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced by Vermont Open Geodata Portal, http://geodata.vermont.gov/pages/imagery. Accessed April 21, 2019.
3. This figure is to be viewed in the context of the accompanying report and is subject to the limitations specified in that report.
4. Orthoimagery © Vermont Open Geodata Portal, 2019. Imagery Date, 2018.
5. USEPA RSL - United States Environmental Protection Agency Regional Screening Levels (RSLs).
6. VSL - Vermont Screening Levels, Investigation and Remediation of Contaminated Properties Rule, July 27, 2018 (Appendix A - Soil Screening Levels).

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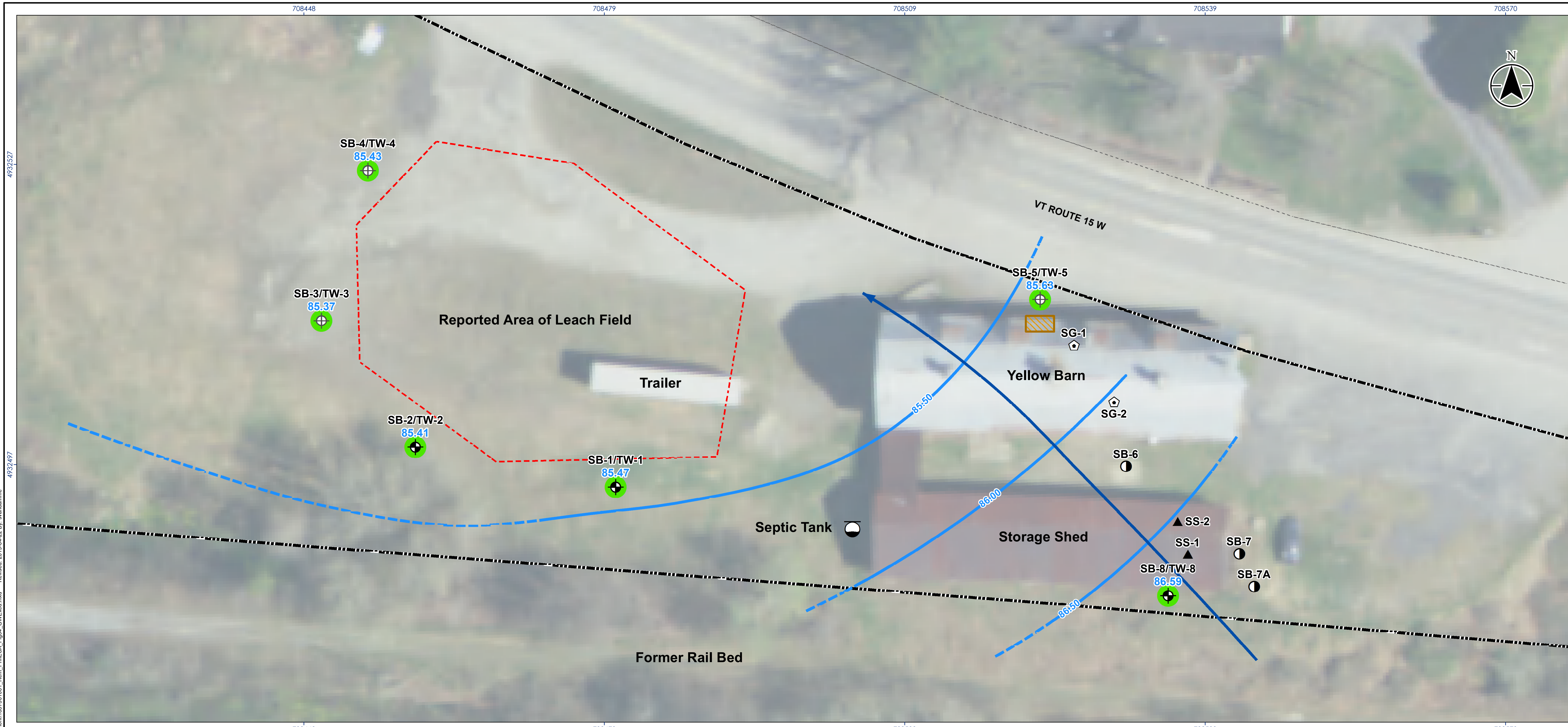

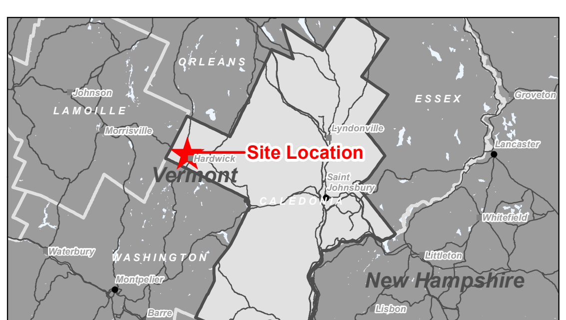

Legend

- Soil Boring
- Soil Boring/Temporary Well
- Soil Boring/Temporary Well with Shallow Soil Sample
- Soil Gas Point
- Surfical Soil Sample
- Septic Tank
- Detected Groundwater Concentrations below Vermont Groundwater Quality Standards
- 87.54 Groundwater Elevation (ft) on 4/18/2019
- Groundwater Contour
- Inferred Groundwater Contour
- Inferred Direction of Groundwater Flow
- Approximate Site Boundary
- Reported Area of Leach Field
- Waste Oil AST
- Parcel Boundary

0 20 40 Feet

1:400 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced by Vermont Open Geodata Portal, http://geodata.vermont.gov/pages/imagery. Accessed April 21, 2019.
3. This figure is to be viewed in the context of the accompanying report and is subject to the limitations specified in that report.
4. Orthoimagery © Vermont Open Geodata Portal, 2019. Imagery Date, 2018.
5. VSL - Vermont Groundwater Quality Standards, Chapter 12 of the Environmental Protection Rules: Groundwater Protection Rule, dated July 11, 2018, Appendix One, Table 1 (Primary Groundwater Quality Standards).

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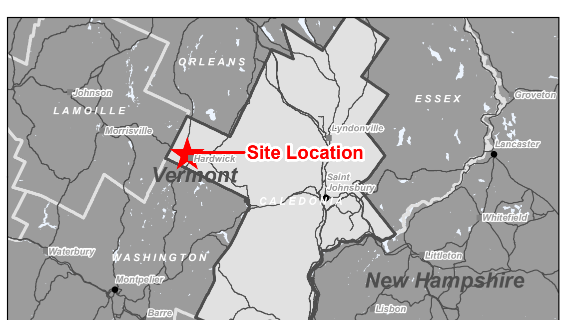
Project Location
281 VT Route 15 West
Hardwick, Vermont

185750100\1 REVA
Prepared by KTS on 8/8/2019

Client/Project
Northeastern Vermont Development Association
Corrective Action Plan
Yellow Barn Site, Hardwick, Vermont

Figure No.
5

Title
Summary of Groundwater Analytical Results and Inferred Direction of Groundwater Flow



Legend

- Soil Boring
- Soil Boring/Temporary Well
- Soil Boring/Temporary Well with Shallow Soil Sample
- Soil Gas Point
- Surfical Soil Sample
- Septic Tank
- Sub-slab Soil Vapor Concentrations did not exceed Vapor Intrusion Screening Values
- Approximate Site Boundary
- Reported Area of Leach Field
- Waste Oil AST
- Parcel Boundary

0 20 40
Feet
1:400 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced by Vermont Open Geodata Portal, http://geodata.vermont.gov/pages/imagery. Accessed April 21, 2019.
3. This figure is to be viewed in the context of the accompanying report and is subject to the limitations specified in that report.
4. Orthoimagery © Vermont Open Geodata Portal, 2019. Imagery Date, 2018.
5. VSL - Vapor Intrusion Screen Values - Sub-Slab Soil Gas - Residential, Invetigation and Remediation of Contaminated Properties Rule, July 27, 2017 (Appendix A - Vapor Intrusion Values).

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Project Location
281 VT Route 15 West
Hardwick, Vermont

1857501001 REVA
Prepared by KTS on 8/8/2019

Client/Project
Northeastern Vermont Development Association
Corrective Action Plan
Yellow Barn Site, Hardwick, Vermont

Figure No.
6

Title
Summary of Soil Vapor Analytical Results

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NOTES

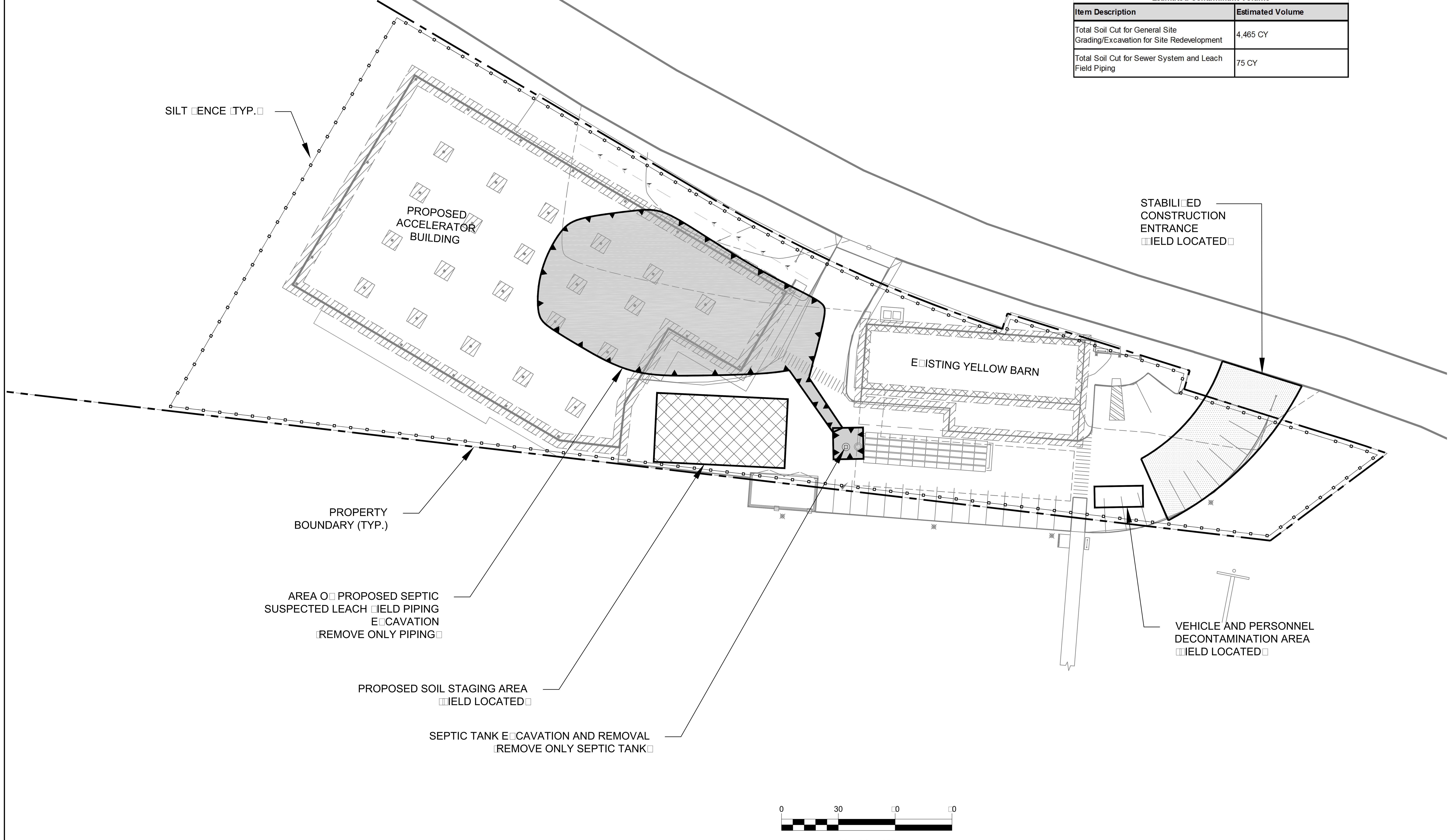
1. MINIMUM OF (3) SAMPLES TO BE COLLECTED FROM SEPTIC TANK EXCAVATION.
2. MINIMUM OF (8) SAMPLES TO BE COLLECTED FROM LEACH FIELD PIPING EXCAVATION.
3. STABILIZED CONSTRUCTION ENTRANCE, TRUCK WASH, AND MATERIAL STOCKPILES SHALL BE FIELD LOCATED AND APPROVED BY ENGINEER PRIOR TO CONSTRUCTION.
4. LEACH FIELD PIPING TO BE LOCATED BY GROUND PENETRATING RADAR SURVEY OR OTHER APPROVED METHOD PRIOR TO EXCAVATION.
5. SEE FIGURE 9 FOR EROSION CONTROL REQUIREMENTS
6. SITE SECURITY TO BE MAINTAINED BY TEMPORARY 8 FOOT HIGH CHAINLINK FENCING THROUGHOUT THE DURATION OF CAP IMPLEMENTATION

LEGEND

- PROPOSED SILT FENCE
- PROPOSED CONSTRUCTION AREA
- STABILIZED CONSTRUCTION ENTRANCE
- PROPOSED APPROXIMATE EXCAVATION AREA
- SEPTIC TANK
- PROPOSED BUILDING FOUNDATION PYLON
- PROPOSED BUILDING FOUNDATION FOOTER

Estimated Contaminant Volume

Item Description	Estimated Volume
Total Soil Cut for General Site Grading/Excavation for Site Redevelopment	4,465 CY
Total Soil Cut for Sewer System and Leach Field Piping	75 CY



ORIGINAL SHEET - ANSI D

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61 Commercial Street, Suite 100
Rochester , NY 14614
Tel. 585-475-1440
www.stantec.com

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Legend

Notes

Revision | By | Appd. | YY.MM.DD

Issued | By | Appd. | YY.MM.DD

File Name: | Dwn. | Chkd. | Dsgn. | YY.MM.DD

Permit-Seal

Client/Project
Northeastern Vermont Development Association
Corrective Action plan
Yellow Barn Site
Hardwick, Vermont

Title
PROPOSED CAP CONSTRUCTION LAYOUT

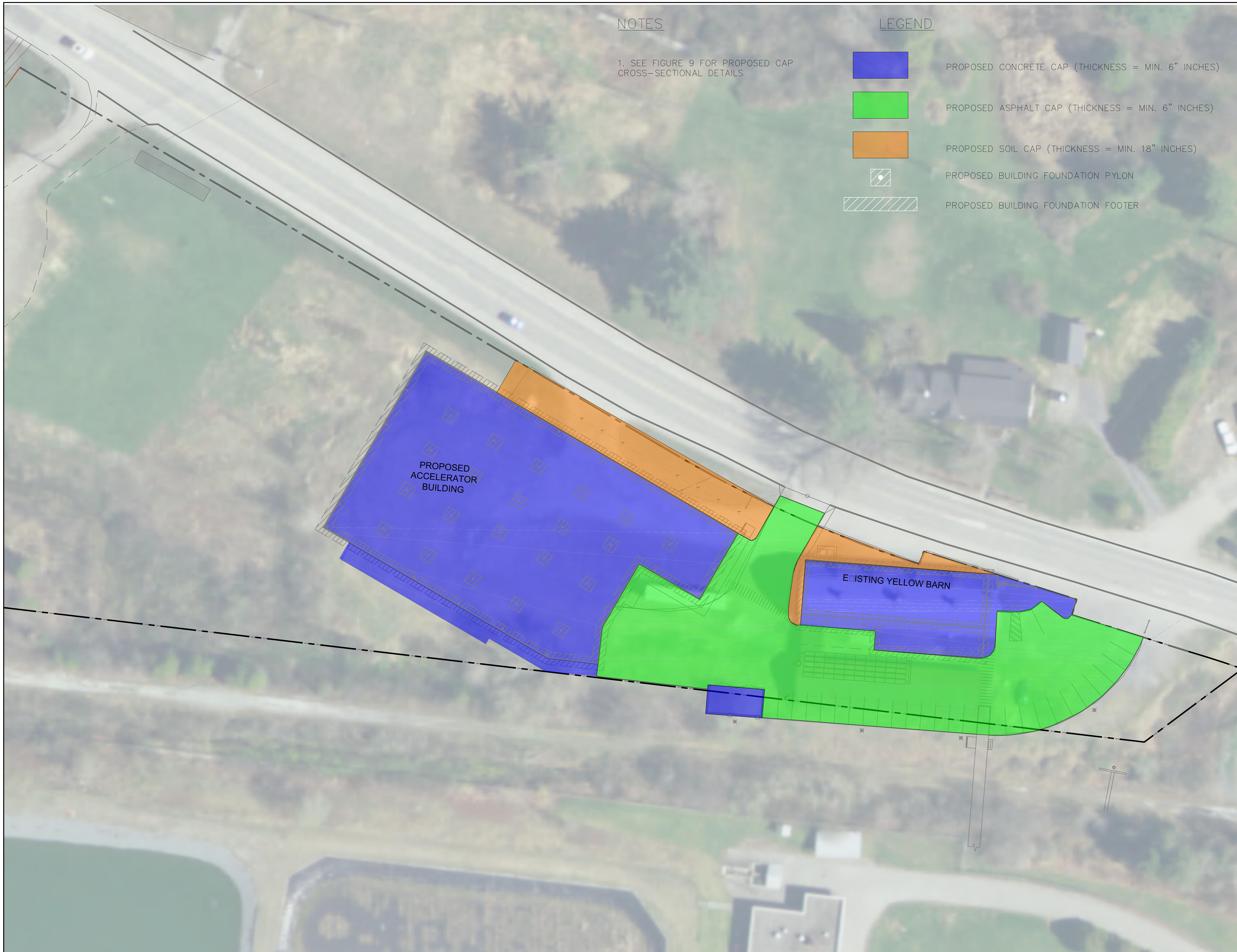
Project No. 185701001

Scale

Drawing No. 7

Sheet of

Revision 0



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Notes

Engineered Barrier Surface Area	
Engineered Barrier Type	Approximate Surface Area (SF)
Concrete	33,058
Asphalt	20,457
Soil	7,138

Revision | By | Appd. | YY.MM.DD

Issued | By | Appd. | YY.MM.DD

File Name: | Dwn. | Chkd. | Dsgn. | YY.MM.DD

Permit-Seal

Client/Project
Northeastern Vermont Development Association

Corrective Action plan
Yellow Barn Site
Hardwick, Vermont

Title

Proposed Surface Cover Materials

Project No. 185701001 | Scale

Drawing No. 8 | Sheet of | Revision 0

GENERAL NOTES:

1. UNLESS SPECI□ICALLY STATED HEREIN□THESE PLANS ARE NOT SUITABLE □OR MACHINE GUIDANCE USE OR PURPOSES DURING CONSTRUCTION. NO GUARANTEE IS MADE THAT THE ELECTRONIC DATA SYSTEMS OR □ILE STRUCTURE USED BY STANTEC WILL BE COMPATIBLE WITH THE ELECTRONIC SYSTEMS USED BY THE CONTRACTOR. IN□ORMATION SHOWN ON THE DRAWINGS SHALL TAKE PRECEDENCE OVER THE ELECTRONIC □ILES DATA.

2. THE CONTRACTOR SHALL BE RESPONSIBLE TO SECURE ALL PERMITS AND PROVIDE ALL BONDS RE□UIRED □OR THIS WORK INCLUDING□BUT NOT LIMITED TO UTILITY CONNECTIONS AND SITE CONSTRUCTION.

3. THE CONTRACTOR SHALL BE RESPONSIBLE THAT ALL NECESSARY INSPECTIONS AND□OR CERTI□ICATIONS RE□UIRED BY CODES AND□OR UTILITY SERVICE COMPANIES SHALL BE PER□ORMED PRIOR TO PRO□ECT COMPLETION.

4. MAINTENANCE AND PROTECTION O□ TRA□□IC SHALL BE THE RESPONSIBILITY O□ THE CONTRACTOR.

5. ALL CONES□DRUMS□CONCRETE BARRIERS AND MARKERS ARE TO BE PLACED SO AS TO PROVIDE A MINIMUM 2□CLEARANCE TO THE TRAVELED WAY UNLESS OTHERWISE SHOWN ON THE PLANS AND□OR DIRECTED BY THE OWNER□S REPRESENTATIVE. THE CONTRACTOR SHALL MAKE CERTAIN PLACEMENT O□ CONES□DRUMS AND MARKERS OR BARRICADES SHALL NOT INTER□ERE WITH SIGHT DISTANCE.

□. ALL DEBRIS AND SOILS DERIVED □ROM THE CONTRACTOR□S OPERATIONS □OUND IN THE PUBLIC RIGHT□O□□WAY OR CAUSING NUISANCE TO OPERATIONS SHALL BE CLEANED AND REMOVED ON A DAILY BASIS OR WHEN NOTI□IED BY THE OWNER□S REPRESENTATIVE.

□. THE CONTRACTOR SHALL LOCATE□MARK□SA□EGUARD AND PRESERVE ALL SURVEY CONTROL MONUMENTS AND R.O.W. MONUMENTS IN THE AREAS O□ CONSTRUCTION.

8. CAUTION □NOTICE TO CONTRACTOR□THE CONTRACTOR IS SPECI□ICALLY CAUTIONED THAT THE LOCATION AND□OR ELEVATION O□ E□ISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS O□ THE VARIOUS UTILITY COMPANIES AND□WHERE POSSIBLE□MEASUREMENTS TAKEN IN THE □IELD. THE IN□ORMATION IS NOT TO BE RELIED ON AS BEING E□ACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BE□ORE ANY E□CAVATION TO RE□UEST E□ACT □IELD LOCATION O□ UTILITIES. THE CONTRACTOR SHALL MAKE E□PLORATION E□CAVATIONS TO LOCATE E□ISTING UNDERGROUND UTILITIES SU□□ICIENTLY AHEAD O□ CONSTRUCTION TO PERMIT REVISIONS AS RE□UIRED TO MEET E□ISTING CONDITIONS.

□. THE DRAWINGS ARE INTENDED TO RE□UIRE AND TO INCLUDE ALL LABOR□MATERIAL□AND E□UIPMENT PROPER □OR THE WORK.

10. THE CONTRACTOR SHALL BE HELD RESPONSIBLE □OR CONSTRUCTION MEANS□METHODS□TECHNI□UES□SE□UENCES□AND SA□ETY PROCEDURES. THE OWNER AND□OR ARCHITECT□ENGINEER SHALL NOT BE RESPONSIBLE □OR THE ACTS OR OMISSIONS O□ THE CONTRACTOR□SUBCONTRACTORS OR THEIR AGENTS□EMPLOYEES OR ANY OTHER PERSONS PER□ORMING ANY O□ THE WORK.

11. THE CONTRACTOR SHALL GENERATE A SITE□SPECI□IC HEALTH AND SA□ETY PLAN TO SA□EGUARD EMPLOYEES SA□ETY WHILE PER□ORMING WORK ON THE SITE. THE PLAN SHALL BE SUBMITTED TO THE ENGINEER □OR REVIEW AND APPROVAL PRIOR TO THE START O□ WORK.

12. THE CONTRACTOR SHALL OBSERVE ALL OSHA AND OTHER APPLICABLE SA□ETY RE□UIREMENTS INCLUDING THE USE O□ SA□ETY GLASSES□HARD HATS□HIGH VISIBILITY CLOTHING□AND PROTECTION O□ AREA WHEN WORKING OVERHEAD RE□UIREMENTS. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY □OR CONSTRUCTION SA□ETY AT ALL TIMES.

13. THE CONTRACTOR SHALL COORDINATE WORK WITH ALL DISCIPLINES WITH E□ISTING CONDITIONS□SPECIAL RE□UIREMENTS□ CONSTRUCTION SCHEDULE AND OTHER CONTRACTORS PER□ORMING WORK AT THE SAME TIME.

14. IT SHALL BE THE CONTRACTOR□S RESPONSIBILITY TO REPAIR ANY DAMAGE DONE TO E□ISTING □EATURES AS A RESULT O□ THIS WORK. DAMAGED ITEMS SHALL BE REPLACED IN KIND AND AT NO ADDITIONAL COST TO THE OWNER.

15. SHOP DRAWINGS□REPRODUCTION O□ DESIGN DRAWINGS SHALL NOT BE PERMITTED. MANAGER SHALL REVIEW AND PROVIDE REVIEW STAMP ON SHOP DRAWING SUBMISSION PRIOR TO SUBMITTAL TO ARCHITECT□ENGINEER INDICATING UNDERSTANDING AND ACCEPTANCE O□ SUBMITTAL AND CON□IRMING CON□ORMANCE TO PRO□ECT PLANS□SPECI□ICATIONS.

1□. IT IS THE RESPONSIBILITY O□ THE CONTRACTOR TO REVIEW ALL O□ THE DRAWINGS□SPECI□ICATIONS□SPECIAL NOTES□AND CONTRACT DOCUMENTS ASSOCIATED WITH THIS PRO□ECT WORK SCOPE PRIOR TO THE INITIATION O□ CONSTRUCTION. SHOULD THE CONTRACTOR □IND A CON□LICT WITH THE DOCUMENTS RELATIVE TO THE SPECI□ICATIONS OR APPLICABLE CODES□IT IS THE CONTRACTOR□S RESPONSIBILITY TO NOTI□Y THE OWNER□S REPRESENTATIVE IN WRITING PRIOR TO THE START O□ CONSTRUCTION. □AILURE BY THE CONTRACTOR TO NOTI□Y THE OWNER□S REPRESENTATIVE SHALL CONSTITUTE ACCEPTANCE O□ □ULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE O□ WORK AS DE□INED BY THE DRAWINGS AND IN □ULL CON□ORMANCE WITH STATE AND LOCAL REGULATIONS AND CODES.

EROSION CONTROL NOTES:

1. CONTRACTOR TO PROVIDE□INSTALL□AND MAINTAIN ALL RE□UIRED EROSION CONTROL MEASURES THROUGHOUT CONSTRUCTION.

2. EROSION CONTROL DEVICES TO BE ESTABLISHED PRIOR TO COMMENCING EARTHWORK. EROSION CONTROL DEVICES TO BE MAINTAINED BY THE CONTRACTOR UNTIL UPSTREAM GROUNDCOVER HAS BEEN ESTABLISHED AND REMOVAL IS APPROVED BY THE “QUALIFIED PROFESSIONAL”.

3. DISTURBED AREAS SHALL BE AS SMALL AS PRACTICAL□AND SHALL BE RESTORED□IMPROVED OR TEMPORARILY STABILI□ED AS SOON AS POSSIBLE.

4. CONTRACTOR SHALL TAKE THE NECESSARY MEASURES□INCLUDING POTABLE WATER SPRINKLING□TO PROVIDE DUST CONTROL DURING CONSTRUCTION.

5. CONTRACTOR SHALL PREVENT SEDIMENTS □ROM ENTERING UTILITIES. ALL MANHOLES□CURB INLETS□□IELD INLETS□END SECTIONS OR OTHER SIMILAR DRAINAGE INLET STRUCTURES SHALL BE PROTECTED □ROM SILTATION BY INSTALLING □ILTER □ABRIC□ CRUSHED STONE CHECK DAMS AND□OR E□CAVATED INLET PROTECTION OR OTHER OWNER REPRESENTATIVE APPROVED EROSION CONTROL MEASURES.

□. SEDIMENT BARRIERS □SILT □ENCE□OR APPROVED E□UAL□SHALL BE INSTALLED PRIOR TO ANY GRADING WORK ALONG THE LIMITS O□ DISTURBANCE AND SHALL BE MAINTAINED □OR THE DURATION O□ THE WORK. NO SEDIMENT □ROM THE SITE SHALL BE PERMITTED TO WASH ONTO AD□ACENT PROPERTIES OR ROAD.

□. THE CONTRACTOR SHALL BE RESPONSIBLE □OR THE MAINTENANCE O□ ALL TEMPORARY AND PERMANENT EROSION CONTROL □EATURES AND ALL STORMWATER MANAGEMENT □ACILITIES THROUGHOUT THE DURATION O□ CONSTRUCTION.

   A. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSPECTED BY THE “QUALIFIED INSPECTOR” AT LEAST EVERY 7 CALENDAR DAYS TO ENSURE THAT ALL CONTROLS ARE MAINTAINED AND PROPERLY □UNCTIONING. ANY RE□UIRED REPAIRS SHALL BE MADE BY THE CONTRACTOR PRIOR TO THE END O□ THE WORKDAY.

   B. ALL SEDIMENT TRAPPING DEVICES□AND INLET PROTECTION DEVICES SHALL BE CLEANED O□ ACCUMULATED SILT WHEN STORAGE CAPACITY HAS BEEN REDUCED BY APPRO□IMATELY 50□ O□ THEIR DESIGN CAPACITY.

   C. ALL SEDIMENT SHALL BE REMOVED FROM BEHIND SILT FENCE WHEN IT ACCUMULATES TO A MAXIMUM HEIGHT OF 6” DEEP AT THE □ENCE UNLESS OTHERWISE DIRECTED.

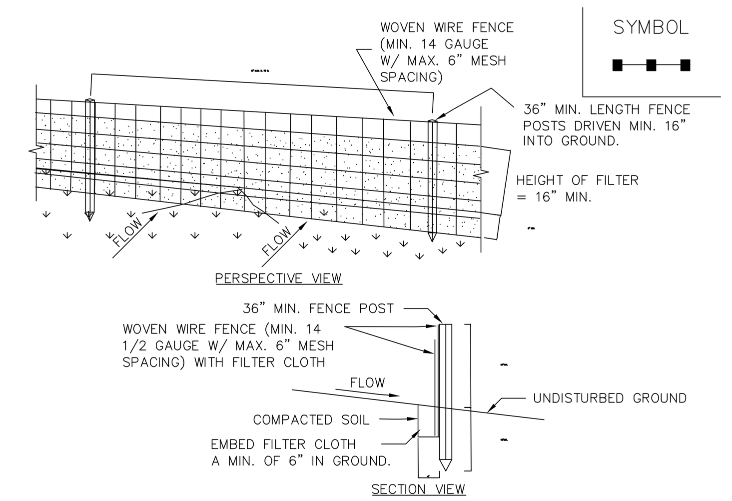
   D. A□TER VEGETATION HAS BEEN SUBSTANTIALLY ESTABLISHED□E□CAVATE SWALES O□ ACCUMULATED SILT. RE□ESTABLISH VEGETATION ON DISTURBED AREAS.

   E. SEDIMENT COLLECTED BY EROSION CONTROL MEASURES SHALL BE DISPOSED O□ BY SPREADING ON□SITE OR HAULED AWAY I□ DETERMINED TO BE UNSUITABLE □OR □ILL

8. ALL DISTURBED AND CONSTRUCTED SLOPE AREAS TO BE SEEDED IMMEDIATELY A□TER CONSTRUCTION HAS BEEN COMPLETED.

ENVIRONMENTAL NOTES:

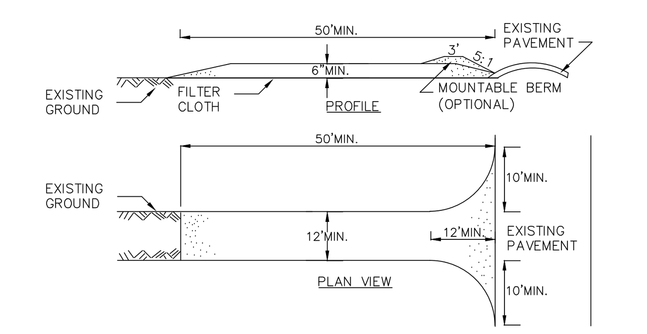
1. SITE SHALL BE SECURED USING TEMPORARY CHAIN LINK □ENCE DURING CAP IMPLEMENTATION.
2. CONTRACTOR SHALL BE RESPONSIBLE □OR MINIMI□ING AND CONTROLLING STORMWATER RUN□IN INTO E□CAVATION AREAS. CONTRACTOR TO INSTALL GROUNDWATER COLLECTION STRUCTURE WITHIN E□CAVATION AREAS □OR REMOVAL AND CONTAINERI□ATION O□ GROUNDWATER DURING E□CAVATION. CONTRACTOR SHALL ALSO BE RESPONSIBLE □OR DEWATERING AND TREATING STORMWATER AND GROUNDWATER ACCUMULATING WITHIN E□CAVATIONS.
3. E□CAVATIONS SHALL BE BENCHED OR SLOPED IN ACCORDANCE WITH APPLICABLE OSHA STANDARDS.
4. E□CAVATION LIMITS AND DEPTHS SHOWN ON DRAWINGS ARE APPRO□IMATE ONLY AND SUB□ECT TO REVISION BASED ON □IELD CONDITIONS.
5. BACK□ILL WILL BE PLACED IN LI□TS NOT TO E□CEED ONE □OOT IN DEPTH. BACK□ILL SHALL BE COMPACTED □5□ O□ THE MODI□IED PROCTOR OR TO THE SPECI□ICATIONS PROVIDED BY THE GEOTECHNICAL ENGINEER.
□. STOCKPILED MATERIAL DESTINE □OR ON□SITE REUSE SHALL BE SCREENED O□ ORGANIC MATTER □TOPSOIL AND PEAT□PRIOR TO USE AS □ILL BENEATH THE BUILDING □OUNDATION. SHOULD THE GEOTECHNICAL ENGINEER DETERMINE THAT SOILS ARE NOT SUITABLE □OR REUSE ON□SITE□MATERIALS WILL BE SAMPLED □OR WASTE CHARACTERI□ATION AND DISPOSED O□□SITE IN A PERMITTED □ACILITY.



CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

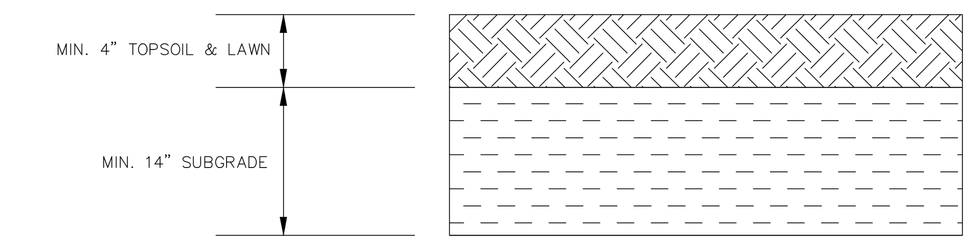
SILT □ENCE



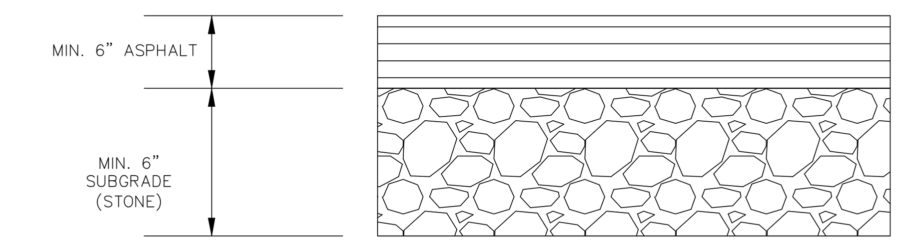
CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS – NOT LESS THAN SIX (6) INCHES.
4. WIDTH – TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CON-STRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

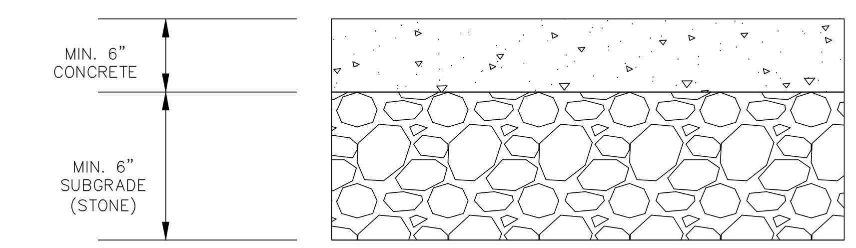
STABILI□ED CONSTRUCTION ENTRANCE



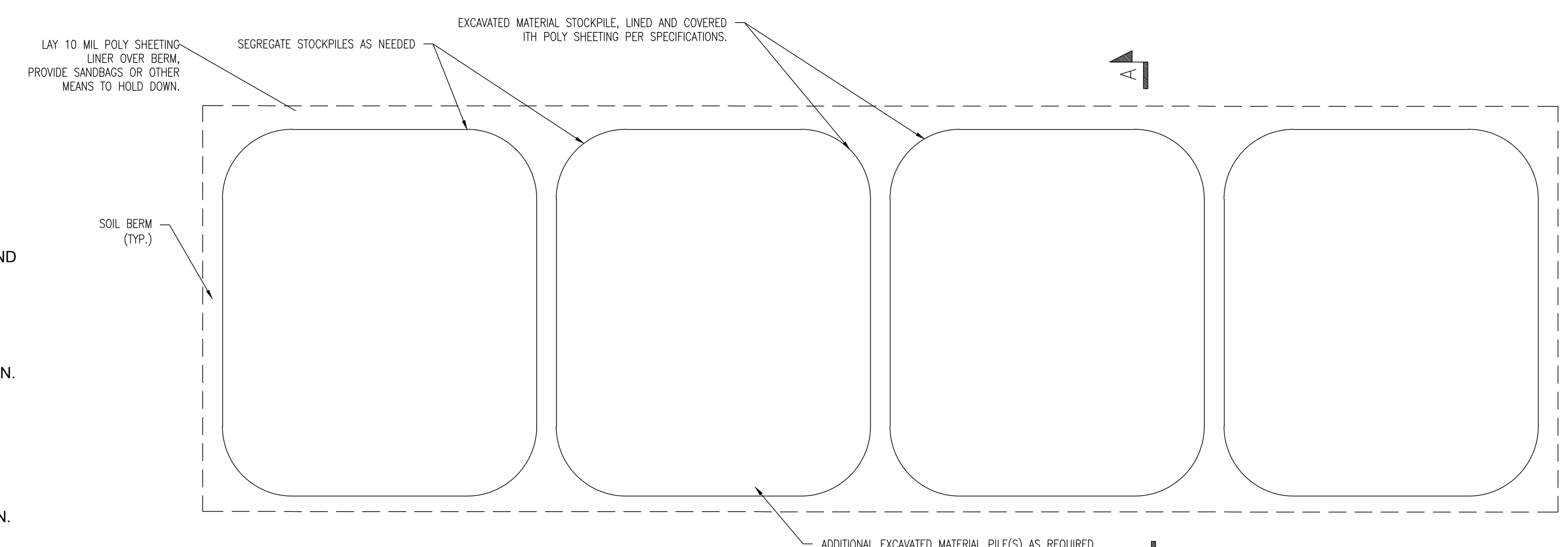
18" SOIL CAP DETAIL



□" ASPHALT PAVING DETAIL WITH SUBGRADE



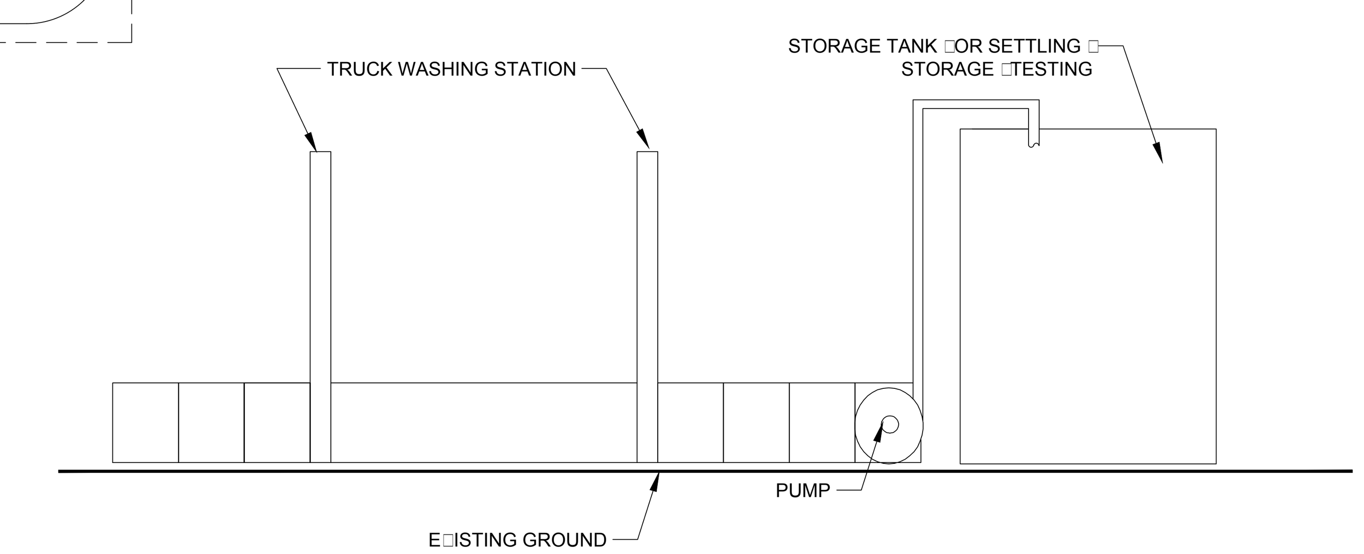
CONCRETE □LOOR DETAIL WITH SUBGRADE



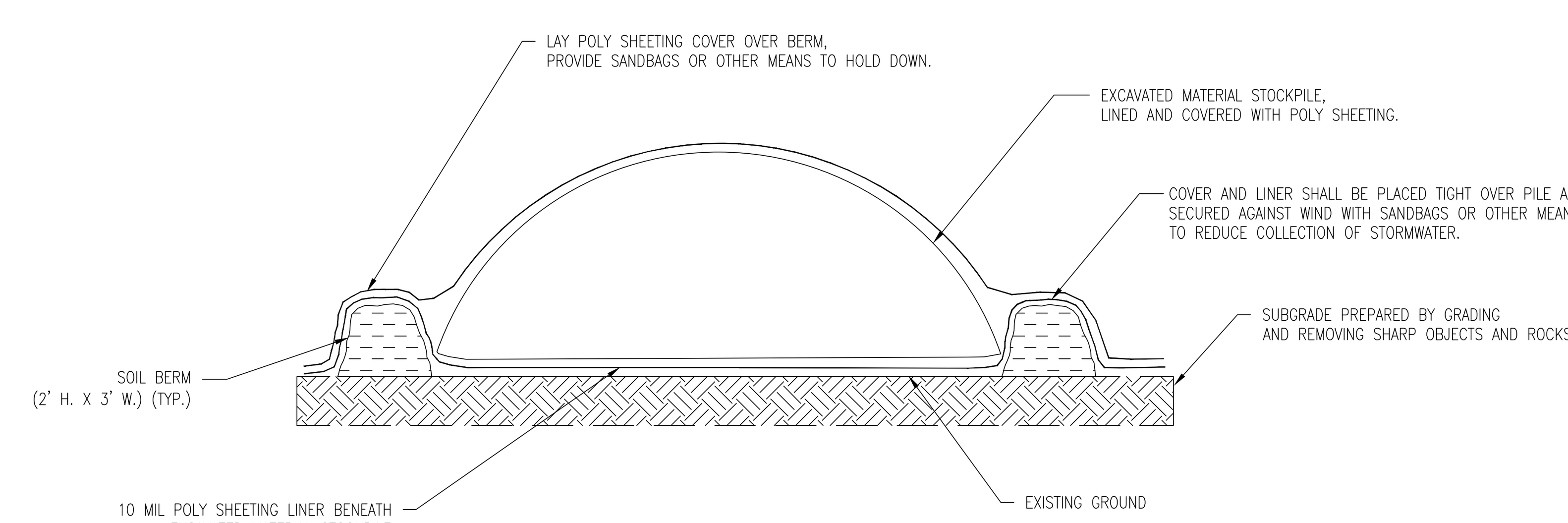
GENERAL NOTES:

1. SOIL BERM SHALL BE CONSTRUCTED USING CLEAN SOIL, SAND, OR STRAW BALES.
2. EXCAVATED MATERIAL STOCKPILE TO BE LINED AND COVERED WITH POLY SHEETING PER PROJECT SPECIFICATIONS.
3. EXCAVATED MATERIAL SHALL BE LOADED IN MANAGEABLE VOLUMES TO PREVENT SPILLAGE DURING HANDLING ON-SITE AND TRANSPORTING.
4. STOCKPILES SHALL BE ROUTINELY INSPECTED AND DAMAGED COVERS SHALL BE PROMPTLY REPAIRED OR REPLACED. STOCKPILES SHALL BE INSPECTED AT A MINIMUM ONCE EACH WEEK AND AFTER EVERY STORM EVENT. RESULTS OF INSPECTIONS SHALL BE RECORDED IN A LOGBOOK AND AVAILABLE FOR INSPECTION BY OWNER OR VTDEC.
5. EXCAVATED STOCKPILED MATERIAL SHALL BE SCREENED WITH A PHOTOIONIZATION DETECTOR AS DESCRIBED IN THE PROJECT SPECIFICATIONS.
6. DETAIL IS INTENDED TO SHOW MINIMUM PERFORMANCE CHARACTERISTICS AND IS ONLY INTENDED FOR CONTRACTOR GUIDANCE.

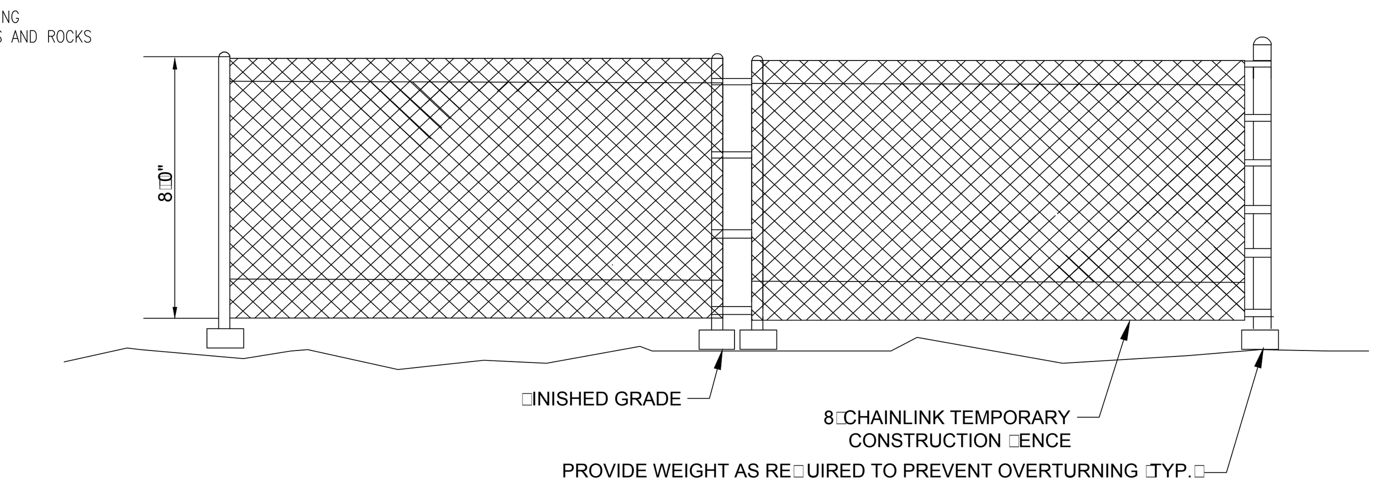
E□CAVATED MATERIAL STOCKPILE □PLAN



TRUCK WASHING STATION



E□CAVATED MATERIAL STOCKPILE □SECTION A□A



8□CHAINLINK TEMPORARY CONSTRUCTION □ENCE

N.T.S.

Stantec
61 Commercial Street, Suite 100
Rochester , NY 14614
Tel. 585-475-1440
www.stantec.com

Consultants

Legend

Notes

Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD

File Name:	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project
Northeastern Vermont Development Association

Corrective Action plan
Yellow Barn Site

Hardwick, Vermont

Title
CORRECTIVE ACTION PLAN DETAILS AND NOTES

Project No.	Scale
185701001	

Drawing No.	Sheet	Revision
9	of	0

V:\1905\temporary\Yellow Barn VT Corrective Action Plan\01_Figures\Drawings From Coe And Coe\Figure 9.dwg
2019/08/09 8:54 AM By: Less, Andy

ORIGINAL SHEET - ANSI D

TABLES

Table 6
Summary of Well Gauging Data
Yellow Barn
281 VT Route 15 West
Hardwick, Vermont

Monitoring Well	Reference Elevation (ft.) [1]	Date	Depth to Water [2] (ft)	Groundwater Elevation (ft)
TW-1	92.92	3/27/2019	9.20	83.72
	92.92	4/18/2019	7.45	85.47
TW-2	92.66	3/27/2019	8.96	83.70
	92.66	4/18/2019	7.25	85.41
TW-3	92.21	3/27/2019	8.55	83.66
	92.21	4/18/2019	6.84	85.37
TW-4	92.97	3/27/2019	9.25	83.72
	92.97	4/18/2019	7.54	85.43
TW-5	98.75	3/28/2019	14.96	83.79
	98.75	4/18/2019	13.12	85.63
TW-8	95.39	3/28/2019	10.59	84.80
	95.39	4/18/2019	8.80	86.59

Notes:

1. Elevations are referenced to a site benchmark (north end of metal strip in garage door opening on east end of barn)
2. Depth to water measured from top of PVC well casing.

Table 7
Summary of Soil Analytical Results
Corrective Action Plan
Yellow Barn
281 VT Route 15 West
Hardwick, Vermont

Sample Location	Units	VSL	USEPA RSL		SB-1		SB-2		SB-3	SB-4		SB-5	SB-6	SB-7A
Sample Date					25-Mar-19	25-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	25-Mar-19	26-Mar-19	26-Mar-19
Sample ID					SB-1 (0.5-1.5)	SB-1 (8-11)	SB-2 (0.5-1.5)	SB-2 (10-14)	SB-3 (8-11)	SB-4 (10-15)	DUP	SB-5 (15-17)	SB-6 (5-9)	SB-7A (5-7)
Sample Depth		Residential	Residential	Industrial	0.5 - 1.5 ft	8 - 11 ft	0.5 - 1.5 ft	10 - 14 ft	8 - 11 ft	10 - 15 ft	10 - 15 ft	15 - 17 ft	5 - 9 ft	5 - 7 ft
Sample Type					Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary
		A	B	C										
Metals														
Arsenic	mg/kg	n/v	0.68	3.0	**12.6**	**12.7**	**10.1**	**6.60**	**12.4**	**2.66**	**2.81**	**11.8**	**12.4**	**12.4**
Barium	mg/kg	11,700	n/a	22,000	**17.4**	**10.8**	**27.5**	**19.5**	**30.7**	**61.5**	**65.6**	**7.79**	**16.3**	**14.4**
Cadmium	mg/kg	7.15	n/a	n/v	<0.044	<0.040	**0.496 J**	**0.472**	**0.492 J**	**0.493 J**	**0.476 J**	<0.047	**0.436 J**	**0.754**
Chromium	mg/kg	n/v	n/v	n/v	**17.6**	**29.4**	**20.2**	**25.3**	**27.1**	**21.1**	**24.0**	**21.8**	**25.1**	**18.4**
Lead	mg/kg	n/v	400	800	**7.62**	**5.28**	**10.3**	**4.90**	**9.79**	**7.80**	**7.30**	**4.36**	**6.13**	**10.0**
Mercury	mg/kg	10.9	n/a	4.6	<0.016	<0.014	<0.019	<0.015	<0.019	<0.020	**0.030 J**	<0.016	<0.016	<0.015
Selenium	mg/kg	382	n/a	580	**0.487 J**	**0.430 J**	**0.409 J**	<0.112	**0.573 J**	<0.151	<0.159	**0.482 J**	**0.204 J**	**0.235 J**
Silver	mg/kg	247	n/a	580	<0.126	<0.115	<0.152	<0.122	<0.162	<0.166	<0.175	<0.135	<0.131	<0.126
Pesticides (8081B)														
Aldrin	µg/kg	20.2	n/a	180	<0.668	-	<0.797	-	-	-	-	-	-	-
BHC, alpha-	µg/kg	n/v	86	360	<0.224	-	<0.268	-	-	-	-	-	-	-
BHC, beta-	µg/kg	n/v	300	1,300	<0.719	-	<0.858	-	-	-	-	-	-	-
BHC, delta-	µg/kg	n/v	n/v	n/v	<0.372	-	<0.443	-	-	-	-	-	-	-
Camphechlor (Toxaphene)	µg/kg	n/v	490	2,100	<9.96	-	<11.9	-	-	-	-	-	-	-
Chlordane (Total)	µg/kg	n/v	1,700	7,700	<6.28	-	<7.50	-	-	-	-	-	-	-
Chlordane, alpha-	µg/kg	n/v	n/v	n/v	<0.661	-	<0.788	-	-	-	-	-	-	-
Chlordane, trans- (gamma-Chlordane)	µg/kg	n/v	n/v	n/v	<0.626	-	<0.747	-	-	-	-	-	-	-
DDD (p,p'-DDD)	µg/kg	n/v	190	2,500	<0.677	-	<0.807	-	-	-	-	-	-	-
DDE (p,p'-DDE)	µg/kg	n/v	2,000	9,300	<0.439	-	**0.984 J**	-	-	-	-	-	-	-
DDT (p,p'-DDT)	µg/kg	n/v	1,900	8,500	<1.52	-	<1.82	-	-	-	-	-	-	-
Dieldrin	µg/kg	n/v	34	140	<0.593	-	<0.707	-	-	-	-	-	-	-
Endosulfan I	µg/kg	n/v	n/v	n/v	<0.448	-	<0.535	-	-	-	-	-	-	-
Endosulfan II	µg/kg	n/v	n/v	n/v	<0.634	-	<0.756	-	-	-	-	-	-	-
Endosulfan Sulfate	µg/kg	n/v	n/v	n/v	<0.376	-	<0.449	-	-	-	-	-	-	-
Endrin	µg/kg	n/v	1,900	25,000	<0.324	-	<0.387	-	-	-	-	-	-	-
Endrin Aldehyde	µg/kg	n/v	n/v	n/v	<0.830	-	<0.990	-	-	-	-	-	-	-
Endrin Ketone	µg/kg	n/v	n/v	n/v	<0.488	-	<0.583	-	-	-	-	-	-	-
Heptachlor	µg/kg	n/v	130	630	<0.425	-	<0.507	-	-	-	-	-	-	-
Heptachlor Epoxide	µg/kg	n/v	70	330	<1.07	-	<1.27	-	-	-	-	-	-	-
Lindane (Hexachlorocyclohexane, gamma)	µg/kg	n/v	570	2,500	<0.353	-	<0.422	-	-	-	-	-	-	-
Methoxychlor (4,4'-Methoxychlor)	µg/kg	n/v	32,000	410,000	<1.11	-	<1.32	-	-	-	-	-	-	-
Herbicides (8151A)														
2,4,5-TP (Silvex)	µg/kg	n/v	51,000	660,000	<5.25	-	<6.30	-	-	-	-	-	-	-
2,4-DB	µg/kg	n/v	190,000	2,500,000	<10.1	-	<12.2	-	-	-	-	-	-	-
Dicamba	µg/kg	n/v	190,000	2,500,000	<6.63	-	<7.96	-	-	-	-	-	-	-
Dichlorophenoxy acetic acid, 2,4- (2,4-D)	µg/kg	n/v	70,000	960,000	<12.4	-	<14.9	-	-	-	-	-	-	-
Dichloropropionic acid, 2,2- (Dalapon)	µg/kg	n/v	190,000	2,500,000	<12.9	-	<15.5	-	-	-	-	-	-	-
Dichlorprop	µg/kg	n/v	n/v	n/v	<11.3	-	<13.6	-	-	-	-	-	-	-
MCPA (2-Methyl-4-Chlorophenoxyacetic Acid)	µg/kg	n/v	3,200	41,000	<1,120	-	<1,340	-	-	-	-	-	-	-
MCPP (2-(2-Methyl-4-chlorophenoxy) propionic acid)	µg/kg	n/v	6,300	82,000	<1,240	-	<1,490	-	-	-	-	-	-	-
Trichlorophenoxy acetic acid, 2,4,5- (2,4,5-T)	µg/kg	n/v	63,000	820,000	<6.12	-	<7.34	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds (8270D)														
Acenaphthene	µg/kg	n/v	360,000	4,500,000	<20	<18	<24	<20	<24	<25	<27	<21	<20	<19
Acenaphthylene	µg/kg	n/v	n/v	n/v	<30	<27	<36	<29	<36	<38	<40	<31	<31	<29
Anthracene	µg/kg	n/v	1,800,000	23,000,000	<38	<34	<46	<37	<46	<48	<51	<39	<39	<36
Benzo(a)anthracene	µg/kg	n/v	1,100	21,000	<22	<20	<27	<21	<26	<28	<29	<23	<22	<21
Benzo(a)pyrene	µg/kg	76	n/a	2,100	<48	<43	<58	<46	<58	<60	<63	<49	<48	<45
Benzo(b)fluoranthene	µg/kg	n/v	1,100	21,000	<33	<29	<40	<32	<40	<41	<44	<34	<33	<31
Benzo(g,h,i)perylene	µg/kg	n/v	n/v	n/v	<23	<20	<28	<22	<28	<29	<30	<24	<23	<22
Benzo(k)fluoranthene	µg/kg	n/v	11,000	210,000	<32	<28	<38	<30	<38	<39	<42	<32	<32	<30
Chloronaphthalene, 2-	µg/kg	n/v	480,000	6,000,000	<20	<17	<24	<19	<23	<24	<26	<20	<20	<18
Chrysene	µg/kg	n/v	110,000	2,100,000	<20	<18	<25	<20	<24	<25	<27	<21	<21	<19
Dibenzo(a,h)anthracene	µg/kg	n/v	110	2,100	<23	<20	<27	<22	<27	<28	<30	<23	<23	<21
Fluoranthene	µg/kg	n/v	240,000	3,000,000	<23	<20	<27	<22	<27	<28	<30	<23	<23	<21
Fluorene	µg/kg	n/v	240,000	3,000,000	<19	<17	<23	<18	<23	<24	<25	<20	<19	<18
Indeno(1,2,3-cd)pyrene	µg/kg	n/v	1,100	21,000	<28	<24	<33	<26	<33	<34	<36	<28	<28	<26
Methylnaphthalene, 1-	µg/kg	n/v	18,000	73,000	<23	<20	<27	<22	<27	<28	<30	<23	<23	<22

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Corrective Action Plan
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Sample Date					25-Mar-19	25-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	25-Mar-19	26-Mar-19	26-Mar-19
Sample ID					SB-1 (0.5-1.5)	SB-1 (8-11)	SB-2 (0.5-1.5)	SB-2 (10-14)	SB-3 (8-11)	SB-4 (10-15)	DUP	SB-5 (15-17)	SB-6 (5-9)	SB-7A (5-7)
Sample Depth		Residential	Residential	Industrial	0.5 - 1.5 ft	8 - 11 ft	0.5 - 1.5 ft	10 - 14 ft	8 - 11 ft	10 - 15 ft	10 - 15 ft	15 - 17 ft	5 - 9 ft	5 - 7 ft
Sample Type	Units	A	B	C	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary
Methylnaphthalene, 2-	µg/kg	n/v	24,000	300,000	<24	<21	<29	<23	<28	<30	<31	<24	<24	<22
Naphthalene	µg/kg	1,420	n/a	17,000	<24	<21	<29	<23	<29	<30	<32	<24	<24	<23
Phenanthrene	µg/kg	n/v	n/v	n/v	<24	<21	<29	<23	<29	<30	<32	<24	<24	<22
Pyrene	µg/kg	n/v	180,000	2,300,000	<20	<17	<24	<19	<23	<24	<26	<20	<20	<18
Benzo(a)pyrene TEQ	µg/kg	76	n/a	2,100	0	0	0	0	0	0	0	0	0	0
Volatile Organic Compounds (8260C)														
Acetone	µg/kg	39,900,000	n/a	67,000,000	-	<3.5	-	**31**	**110**	**73**	**110**	<4.0	**64**	**5.6 J**
Acrylonitrile	µg/kg	n/v	250	1,100	-	<0.84	-	<0.78	<1.3	<1.3	<1.4	<0.95	<1.1	<0.78
Benzene	µg/kg	442	n/a	5,100	-	<0.12	-	<0.11	<0.19	<0.19	<0.20	<0.14	<0.15	<0.11
Bromobenzene	µg/kg	n/v	29,000	180,000	-	<0.11	-	<0.10	<0.17	<0.17	<0.18	<0.12	<0.13	<0.10
Bromodichloromethane	µg/kg	n/v	290	1,300	-	<0.08	-	<0.07	<0.13	<0.13	<0.13	<0.09	<0.10	<0.07
Bromoform (Tribromomethane)	µg/kg	n/v	19,000	86,000	-	<0.18	-	<0.17	<0.28	<0.29	<0.30	<0.20	<0.23	<0.17
Bromomethane (Methyl bromide)	µg/kg	n/v	680	3,000	-	<0.42	-	<0.40	<0.67	<0.68	<0.70	<0.48	<0.54	<0.40
Butylbenzene, n-	µg/kg	n/v	390,000	5,800,000	-	<0.12	-	<0.11	<0.19	<0.19	<0.20	<0.14	<0.15	<0.11
Butylbenzene, sec- (2-Phenylbutane)	µg/kg	n/v	780,000	12,000,000	-	<0.11	-	<0.10	<0.17	<0.17	<0.18	<0.12	<0.14	<0.10
Butylbenzene, tert-	µg/kg	n/v	780,000	12,000,000	-	<0.09	-	<0.08	<0.14	<0.14	<0.14	<0.10	<0.11	<0.08
Carbon Disulfide	µg/kg	n/v	77,000	350,000	-	<3.3	-	<3.1	<5.3	<5.3	<5.5	<3.8	<4.2	<3.1
Carbon Tetrachloride (Tetrachloromethane)	µg/kg	247	n/a	2,900	-	<0.17	-	<0.16	<0.27	<0.27	<0.28	<0.19	<0.21	<0.16
Chlorobenzene (Monochlorobenzene)	µg/kg	273,000	n/a	130,000	-	<0.09	-	<0.09	<0.15	<0.15	<0.15	<0.10	<0.12	<0.09
Chlorobromomethane	µg/kg	129,000	n/a	63,000	-	<0.15	-	<0.14	<0.24	<0.24	<0.25	<0.17	<0.19	<0.14
Chloroethane (Ethyl Chloride)	µg/kg	n/v	1,400,000	5,700,000	-	<0.33	-	<0.31	<0.52	<0.52	<0.54	<0.37	<0.42	<0.31
Chloroform (Trichloromethane)	µg/kg	n/v	320	1,400	-	<0.10	-	<0.10	<0.16	<0.16	<0.17	<0.12	<0.13	<0.10
Chloromethane	µg/kg	n/v	11,000	46,000	-	<0.68	-	<0.64	<1.1	<1.1	<1.1	<0.77	<0.86	<0.63
Chlorotoluene, 2-	µg/kg	n/v	160,000	2,300,000	-	<0.14	-	<0.13	<0.22	<0.22	<0.23	<0.16	<0.18	<0.13
Chlorotoluene, 4-	µg/kg	n/v	160,000	2,300,000	-	<0.08	-	<0.07	<0.12	<0.12	<0.13	<0.09	<0.10	<0.07
Dibromo-3-Chloropropane, 1,2- (DBCP)	µg/kg	3.27	n/a	64	-	<0.73	-	<0.68	<1.2	<1.2	<1.2	<0.82	<0.92	<0.68
Dibromochloromethane	µg/kg	n/v	8,300	39,000	-	<0.10	-	<0.10	<0.16	<0.16	<0.17	<0.12	<0.13	<0.10
Dibromomethane (Methylene Bromide)	µg/kg	n/v	2,400	9,900	-	<0.17	-	<0.16	<0.28	<0.28	<0.29	<0.20	<0.22	<0.16
Dichloro-2-Butene, trans-1,4-	µg/kg	n/v	7.4	32	-	<1.0	-	<0.97	<1.6	<1.6	<1.7	<1.2	<1.3	<0.97
Dichlorobenzene, 1,2-	µg/kg	n/v	180,000	930,000	-	<0.10	-	<0.10	<0.17	<0.17	<0.17	<0.12	<0.13	<0.10
Dichlorobenzene, 1,3-	µg/kg	n/v	n/v	n/v	-	<0.11	-	<0.10	<0.17	<0.17	<0.18	<0.12	<0.14	<0.10
Dichlorobenzene, 1,4-	µg/kg	n/v	2,600	11,000	-	<0.12	-	<0.12	<0.20	<0.20	<0.21	<0.14	<0.16	<0.12
Dichlorobutane, 1,4-	µg/kg	n/v	n/v	n/v	-	<0.16	-	<0.15	<0.26	<0.26	<0.27	<0.19	<0.21	<0.15
Dichlorodifluoromethane (Freon 12)	µg/kg	n/v	8,700	37,000	-	<0.67	-	<0.62	<1.1	<1.1	<1.1	<0.76	<0.85	<0.62
Dichloroethane, 1,1-	µg/kg	n/v	3,600	16,000	-	<0.11	-	<0.10	<0.17	<0.17	<0.18	<0.12	<0.13	<0.10
Dichloroethane, 1,2-	µg/kg	175	n/a	2,000	-	<0.19	-	<0.18	<0.30	<0.30	<0.31	<0.21	<0.24	<0.18
Dichloroethene, 1,1-	µg/kg	n/v	23,000	100,000	-	<0.17	-	<0.16	<0.28	<0.28	<0.29	<0.20	<0.22	<0.16
Dichloroethene, cis-1,2-	µg/kg	146,000	n/a	230,000	-	<0.13	-	<0.12	<0.20	<0.20	<0.21	<0.14	<0.16	<0.12
Dichloroethene, trans-1,2-	µg/kg	1,460,000	n/a	2,300,000	-	<0.10	-	<0.09	<0.16	<0.16	<0.16	<0.11	<0.13	<0.09
Dichloroethene-1,2- (sum)	µg/kg	n/v	n/v	n/v	-	<0.10	-	<0.09	<0.16	<0.16	<0.16	<0.11	<0.13	<0.09
Dichloropropane, 1,2-	µg/kg	n/v	1,600	6,600	-	<0.09	-	<0.09	<0.14	<0.14	<0.15	<0.10	<0.12	<0.09
Dichloropropane, 1,3-	µg/kg	n/v	160,000	2,300,000	-	<0.12	-	<0.11	<0.19	<0.19	<0.20	<0.14	<0.15	<0.11
Dichloropropane, 2,2-	µg/kg	n/v	n/v	n/v	-	<0.15	-	<0.14	<0.23	<0.23	<0.24	<0.17	<0.19	<0.14
Dichloropropene, 1,1-	µg/kg	n/v	n/v	n/v	-	<0.12	-	<0.11	<0.18	<0.18	<0.19	<0.13	<0.15	<0.11
Dichloropropene, 1,3- (sum of isomers cis + trans)	µg/kg	n/v	1,800	8,200	-	<0.12	-	<0.11	<0.18	<0.18	<0.19	<0.13	<0.15	<0.11
Dichloropropene, cis-1,3-	µg/kg	n/v	n/v	n/v	-	<0.12	-	<0.11	<0.18	<0.18	<0.19	<0.13	<0.15	<0.11
Dichloropropene, trans-1,3-	µg/kg	n/v	n/v	n/v	-	<0.20	-	<0.19	<0.32	<0.32	<0.33	<0.22	<0.25	<0.18
Ethyl Ether (Diethyl ether)	µg/kg	n/v	1,600,000	23,000,000	-	<0.25	-	<0.23	<0.40	<0.40	<0.41	<0.28	<0.32	<0.23
Ethyl Methacrylate	µg/kg	n/v	180,000	760,000	-	<1.2	-	<1.1	<1.8	<1.8	<1.9	<1.3	<1.5	<1.1
Ethylbenzene	µg/kg	2,210	n/a	25,000	-	<0.10	-	<0.10	<0.16	<0.16	<0.17	<0.12	<0.13	<0.10
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/kg	n/v	36	160	-	<0.20	-	<0.19	<0.32	<0.32	<0.34	<0.23	<0.26	<0.19
Hexachlorobutadiene (Hexachloro-1,3-butadiene)	µg/kg	n/v	1,200	5,300	-	<0.12	-	<0.12	<0.20	<0.20	<0.20	<0.14	<0.16	<0.12
Hexanone, 2- (Methyl Butyl Ketone)	µg/kg	n/v	20,000	130,000	-	<0.86	-	<0.80	<1.4	<1.4	<1.4	<0.98	<1.1	<0.80
Isopropylbenzene	µg/kg	n/v	190,000	990,000	-	<0.08	-	<0.07	<0.13	<0.13	<0.13	<0.09	<0.10	<0.07
Isopropyltoluene, p- (Cymene)	µg/kg	n/v	n/v	n/v	-	<0.08	-	<0.07	**0.26 J**	<0.13	<0.13	<0.09	<0.10	<0.07
Methyl Ethyl Ketone (MEK) (2-Butanone)	µg/kg	26,000,000	n/a	19,000,000	-	<1.6	-	**3.2 J**	**20**	**10 J**	**21**	<1.8	**6.4 J**	<1.5
Methyl Isobutyl Ketone (MIBK)	µg/kg	n/v	3,300,000	14,000,000	-	<0.94	-	<0.87	**2.3 J**	<1.5	<1.5	<1.0	<1.2	<0.87
Methyl tert-butyl ether (MTBE)	µg/kg	n/v	47,000	210,000	-	<0.15	-	<0.14	<0.23	<0.23	<0.24	<0.17	<0.19	<0.14
Methylene Chloride (Dichloromethane)	µg/kg	n/v	35,000	320,000	-	<1.7	-	<1.6	<2.6	<2.7	<2.8	<1.9	<2.1	<1.6

Table 7
Summary of Soil Analytical Results
Corrective Action Plan
Yellow Barn
281 VT Route 15 West
Hardwick, Vermont

Sample Location		VSL	USEPA RSL		SB-1		SB-2		SB-3	SB-4		SB-5	SB-6	SB-7A
Sample Date					25-Mar-19	25-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	25-Mar-19	26-Mar-19	26-Mar-19
Sample ID					SB-1 (0.5-1.5)	SB-1 (8-11)	SB-2 (0.5-1.5)	SB-2 (10-14)	SB-3 (8-11)	SB-4 (10-15)	DUP	SB-5 (15-17)	SB-6 (5-9)	SB-7A (5-7)
Sample Depth		Residential	Residential	Industrial	0.5 - 1.5 ft	8 - 11 ft	0.5 - 1.5 ft	10 - 14 ft	8 - 11 ft	10 - 15 ft	10 - 15 ft	15 - 17 ft	5 - 9 ft	5 - 7 ft
Sample Type	Units	A	B	C	Primary	Primary	Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary
Naphthalene	µg/kg	1,420	n/a	17,000	-	<0.48	-	<0.44	<0.75	<0.76	<0.78	<0.54	<0.60	<0.44
Propylbenzene, n-	µg/kg	n/v	380,000	2,400,000	-	<0.12	-	<0.12	<0.20	<0.20	<0.21	<0.14	<0.16	<0.12
Styrene	µg/kg	n/v	600,000	3,500,000	-	<0.14	-	<0.13	<0.23	<0.23	<0.24	<0.16	<0.18	<0.13
Tetrachloroethane, 1,1,1,2-	µg/kg	n/v	2,000	8,800	-	<0.10	-	<0.09	<0.15	<0.15	<0.16	<0.11	<0.12	<0.09
Tetrachloroethane, 1,1,2,2-	µg/kg	n/v	600	2,700	-	<0.12	-	<0.11	<0.19	<0.19	<0.20	<0.14	<0.15	<0.11
Tetrachloroethene (PCE)	µg/kg	1,460	n/a	39,000	-	<0.14	-	<0.13	<0.23	<0.23	<0.24	<0.16	<0.18	<0.13
Tetrahydrofuran	µg/kg	n/v	1,800,000	9,400,000	-	<1.2	-	<1.1	<1.8	<1.8	<1.9	<1.3	<1.5	<1.1
Toluene	µg/kg	4,640,000	n/a	4,700,000	-	<0.40	-	<0.37	<0.63	<0.63	<0.66	<0.45	<0.50	<0.37
Trichlorobenzene, 1,2,3-	µg/kg	n/v	6,300	93,000	-	<0.24	-	<0.22	<0.37	<0.37	<0.39	<0.27	<0.30	<0.22
Trichlorobenzene, 1,2,4-	µg/kg	n/v	5,800	26,000	-	<0.20	-	<0.18	<0.32	<0.32	<0.33	<0.22	<0.25	<0.18
Trichloroethane, 1,1,1-	µg/kg	n/v	810,000	3,600,000	-	<0.12	-	<0.11	<0.19	<0.19	<0.20	<0.14	<0.15	<0.11
Trichloroethane, 1,1,2-	µg/kg	n/v	150	630	-	<0.20	-	<0.18	<0.31	<0.31	<0.32	<0.22	<0.25	<0.18
Trichloroethene (TCE)	µg/kg	442	n/a	1,900	-	<0.10	-	<0.09	<0.16	<0.16	<0.16	<0.11	<0.13	<0.09
Trichlorofluoromethane (Freon 11)	µg/kg	n/v	2,300,000	35,000,000	-	<0.51	-	<0.47	<0.81	<0.81	<0.84	<0.57	<0.64	<0.47
Trichloropropane, 1,2,3-	µg/kg	3.24	n/a	110	-	<0.09	-	<0.09	<0.15	<0.15	<0.15	<0.10	<0.12	<0.09
Trimethylbenzene, 1,2,4-	µg/kg	264,000	n/a	180,000	-	<0.24	-	<0.23	<0.39	<0.39	<0.40	<0.28	<0.31	<0.23
Trimethylbenzene, 1,3,5-	µg/kg	264,000	n/a	150,000	-	<0.14	-	<0.13	<0.22	<0.22	<0.23	<0.16	<0.18	<0.13
Total Trimethylbenzenes	µg/kg	264,000	n/v	n/v	-	0	-	0	0	0	0	0	0	0
Vinyl Acetate	µg/kg	n/v	91,000	380,000	-	<1.6	-	<1.5	<2.5	<2.5	<2.6	<1.8	<2.0	<1.5
Vinyl Chloride	µg/kg	n/v	59	1,700	-	<0.24	-	<0.23	<0.39	<0.39	<0.40	<0.28	<0.31	<0.23
Xylene, m & p-	µg/kg	n/v	n/v	n/v	-	<0.41	-	<0.38	<0.65	<0.65	<0.68	<0.46	<0.52	<0.38
Xylene, o-	µg/kg	n/v	65,000	280,000	-	<0.21	-	<0.20	<0.34	<0.34	<0.35	<0.24	<0.27	<0.20
Xylenes, Total	µg/kg	575,000	n/a	250,000	-	<0.21	-	<0.20	<0.34	<0.34	<0.35	<0.24	<0.27	<0.20

Notes:

VSL	Vermont Screening Levels, Investigation and Remediation of Contaminated Properties Rule, July 27, 2017 (Appendix A - Soil Screening Levels).
A	Vermont Soil Screening Levels
USEPA RSL	United States Environmental Protection Agency Regional Screening Levels (RSLs)
B	Resident Soil Screening Levels (TR=1E-06, THQ=0.1) (May 2018)
C	Industrial Soil Screening Levels (TR=1E-06, THQ=0.1) (May 2018)
6.5	Concentration exceeds the indicated standard A.
6.5	Concentration exceeds the indicated standard C.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Non-detect value exceeds the most stringent of all criteria.
<0.03	Analyte was not detected at a concentration greater than the laboratory method detection limit.
n/a	Vermont Screening Levels (VSLs) for residential soil concentrations used; EPA Residential RSL not applicable.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
TEQ	Toxic Equivalence Quotient
TPH	Total petroleum hydrocarbons
	Soil results are reported on a dry-weight basis.
	Total Trihalomethanes: comprised of bromodichloromethane, bromoform, chloroform, and dibromochloromethane.
	Total Trimethylbenzenes: 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene.

Data Validation Qualifiers:

J The reported result is an estimated value.

Table 7
Summary of Soil Analytical Results
Corrective Action Plan
Yellow Barn
281 VT Route 15 West
Hardwick, Vermont

Sample Location		VSL	USEPA RSL		SB-8		SS-1		SS-2	
Sample Date					25-Mar-19	25-Mar-19	29-Mar-19	29-Mar-19	29-Mar-19	29-Mar-19
Sample ID					SB-8 (0.5-1.5)	SB-8 (10-14)	SS-1 (0-0.5)	SS-1 (3.0-3.5)	SS-2 (0-0.5)	SS-2 (36-43)
Sample Depth		Residential	Residential	Industrial	0.5 - 1.5 ft	10 - 14 ft	0 - 0.5 ft	3 - 3.5 ft	0 - 0.5 ft	3.0 - 3.6 ft
Sample Type	Units				Primary	Primary	Primary	Primary	Primary	Primary
		A	B	C						
Metals										
Arsenic	mg/kg	n/v	0.68	3.0	**7.64**	**11.1**	**6.61**	**8.28**	**5.58**	**5.77**
Barium	mg/kg	11,700	n/a	22,000	**23.8**	**6.91**	**28.6**	**47.8**	**26.8**	**38.7**
Cadmium	mg/kg	7.15	n/a	n/v	<0.043	<0.043	**1.10**	**1.45**	**4.16**	**0.945**
Chromium	mg/kg	n/v	n/v	n/v	**12.4**	**19.1**	**12.2**	**25.2**	**11.4**	**29.2**
Lead	mg/kg	n/v	400	800	**20.8**	**6.89**	**95.8**	**159**	**127**	**6.58**
Mercury	mg/kg	10.9	n/a	4.6	<0.015	<0.015	<0.017	**0.020 J**	<0.017	<0.018
Selenium	mg/kg	382	n/a	580	**0.436 J**	**0.312 J**	<0.125	<0.143	<0.128	<0.129
Silver	mg/kg	247	n/a	580	<0.123	<0.123	<0.137	<0.157	**0.916**	**0.175 J**
Pesticides (8081B)										
Aldrin	µg/kg	20.2	n/a	180	<0.611	-	-	-	-	-
BHC, alpha-	µg/kg	n/v	86	360	<0.205	-	-	-	-	-
BHC, beta-	µg/kg	n/v	300	1,300	<0.658	-	-	-	-	-
BHC, delta-	µg/kg	n/v	n/v	n/v	<0.340	-	-	-	-	-
Camphechlor (Toxaphene)	µg/kg	n/v	490	2,100	<9.11	-	-	-	-	-
Chlordane (Total)	µg/kg	n/v	1,700	7,700	<5.75	-	-	-	-	-
Chlordane, alpha-	µg/kg	n/v	n/v	n/v	<0.604	-	-	-	-	-
Chlordane, trans- (gamma-Chlordane)	µg/kg	n/v	n/v	n/v	<0.572	-	-	-	-	-
DDD (p,p'-DDD)	µg/kg	n/v	190	2,500	<0.619	-	-	-	-	-
DDE (p,p'-DDE)	µg/kg	n/v	2,000	9,300	<0.401	-	-	-	-	-
DDT (p,p'-DDT)	µg/kg	n/v	1,900	8,500	<1.40	-	-	-	-	-
Dieldrin	µg/kg	n/v	34	140	<0.542	-	-	-	-	-
Endosulfan I	µg/kg	n/v	n/v	n/v	<0.410	-	-	-	-	-
Endosulfan II	µg/kg	n/v	n/v	n/v	<0.580	-	-	-	-	-
Endosulfan Sulfate	µg/kg	n/v	n/v	n/v	<0.344	-	-	-	-	-
Endrin	µg/kg	n/v	1,900	25,000	<0.296	-	-	-	-	-
Endrin Aldehyde	µg/kg	n/v	n/v	n/v	<0.759	-	-	-	-	-
Endrin Ketone	µg/kg	n/v	n/v	n/v	<0.447	-	-	-	-	-
Heptachlor	µg/kg	n/v	130	630	<0.389	-	-	-	-	-
Heptachlor Epoxide	µg/kg	n/v	70	330	<0.976	-	-	-	-	-
Lindane (Hexachlorocyclohexane, gamma)	µg/kg	n/v	570	2,500	<0.323	-	-	-	-	-
Methoxychlor (4,4'-Methoxychlor)	µg/kg	n/v	32,000	410,000	<1.01	-	-	-	-	-
Herbicides (8151A)										
2,4,5-TP (Silvex)	µg/kg	n/v	51,000	660,000	<5.02	-	-	-	-	-
2,4-DB	µg/kg	n/v	190,000	2,500,000	<9.69	-	-	-	-	-
Dicamba	µg/kg	n/v	190,000	2,500,000	<6.34	-	-	-	-	-
Dichlorophenoxy acetic acid, 2,4- (2,4-D)	µg/kg	n/v	70,000	960,000	<11.9	-	-	-	-	-
Dichloropropionic acid, 2,2- (Dalapon)	µg/kg	n/v	190,000	2,500,000	<12.3	-	-	-	-	-
Dichlorprop	µg/kg	n/v	n/v	n/v	<10.8	-	-	-	-	-
MCPA (2-Methyl-4-Chlorophenoxyacetic Acid)	µg/kg	n/v	3,200	41,000	<1,070	-	-	-	-	-
MCPP (2-(2-Methyl-4-chlorophenoxy) propionic acid)	µg/kg	n/v	6,300	82,000	<1,190	-	-	-	-	-
Trichlorophenoxy acetic acid, 2,4,5- (2,4,5-T)	µg/kg	n/v	63,000	820,000	<5.84	-	-	-	-	-
Semi-Volatile Organic Compounds (8270D)										
Acenaphthene	µg/kg	n/v	360,000	4,500,000	<19	<20	<62	<68	<62	<23
Acenaphthylene	µg/kg	n/v	n/v	n/v	<28	<29	<93	<100	<93	<34
Anthracene	µg/kg	n/v	1,800,000	23,000,000	<36	<37	<120	<130	<120	<43
Benzo(a)anthracene	µg/kg	n/v	1,100	21,000	**54 J**	<22	<68	<74	<68	<25
Benzo(a)pyrene	µg/kg	76	n/a	2,100	**56 J**	<47	<150	<160	<150	<54
Benzo(b)fluoranthene	µg/kg	n/v	1,100	21,000	**72 J**	<32	<100	<110	<100	<37
Benzo(g,h,i)perylene	µg/kg	n/v	n/v	n/v	**35 J**	<22	**160 J**	<77	**410 J**	<26
Benzo(k)fluoranthene	µg/kg	n/v	11,000	210,000	<29	<30	<96	<100	<96	<35
Chloronaphthalene, 2-	µg/kg	n/v	480,000	6,000,000	<18	<19	<60	<65	<60	<22
Chrysene	µg/kg	n/v	110,000	2,100,000	**53 J**	<20	<62	<68	<63	<23
Dibenzo(a,h)anthracene	µg/kg	n/v	110	2,100	<21	<22	<70	<76	<70	<25
Fluoranthene	µg/kg	n/v	240,000	3,000,000	**100 J**	<22	<69	<76	<69	<25
Fluorene	µg/kg	n/v	240,000	3,000,000	<18	<18	<58	<64	<58	<21
Indeno(1,2,3-cd)pyrene	µg/kg	n/v	1,100	21,000	**39 J**	<27	<84	<92	**140 J**	<31
Methylnaphthalene, 1-	µg/kg	n/v	18,000	73,000	<21	<22	<70	<76	<70	<26

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Summary of Soil Analytical Results
Corrective Action Plan
Yellow Barn
281 VT Route 15 West
Hardwick, Vermont

Sample Location	Units	VSL	USEPA RSL		SB-8		SS-1		SS-2	
Sample Date					25-Mar-19	25-Mar-19	29-Mar-19	29-Mar-19	29-Mar-19	29-Mar-19
Sample ID					SB-8 (0.5-1.5)	SB-8 (10-14)	SS-1 (0-0.5)	SS-1 (3.0-3.5)	SS-2 (0-0.5)	SS-2 (36-43)
Sample Depth		Residential	Residential	Industrial	0.5 - 1.5 ft	10 - 14 ft	0 - 0.5 ft	3 - 3.5 ft	0 - 0.5 ft	3.0 - 3.6 ft
Sample Type					Primary	Primary	Primary	Primary	Primary	Primary
		A	B	C						
Methylnaphthalene, 2-	µg/kg	n/v	24,000	300,000	<22	<23	<73	<80	<73	<26
Naphthalene	µg/kg	1,420	n/a	17,000	<22	<23	<73	<80	<73	<27
Phenanthrene	µg/kg	n/v	n/v	n/v	**40 J**	<23	<73	<80	<73	<27
Pyrene	µg/kg	n/v	180,000	2,300,000	**100 J**	<19	<60	<65	**63 J**	<22
Benzo(a)pyrene TEQ	µg/kg	76	n/a	2,100	**73**	0	0	0	**14**	0
Volatile Organic Compounds (8260C)										
Acetone	µg/kg	39,900,000	n/a	67,000,000	-	**4.3 J**	<390	<610	<390	**440 J**
Acrylonitrile	µg/kg	n/v	250	1,100	-	<0.70	<93	<150	<92	<100
Benzene	µg/kg	442	n/a	5,100	-	<0.10	<13	<21	<13	<14
Bromobenzene	µg/kg	n/v	29,000	180,000	-	<0.09	<12	<18	<12	<13
Bromodichloromethane	µg/kg	n/v	290	1,300	-	<0.07	<8.8	<14	<8.8	<9.5
Bromoform (Tribromomethane)	µg/kg	n/v	19,000	86,000	-	<0.15	<20	<31	<20	<22
Bromomethane (Methyl bromide)	µg/kg	n/v	680	3,000	-	<0.36	<47	<74	<47	<51
Butylbenzene, n-	µg/kg	n/v	390,000	5,800,000	-	<0.10	<14	<21	<13	<14
Butylbenzene, sec- (2-Phenylbutane)	µg/kg	n/v	780,000	12,000,000	-	<0.09	<12	<18	<12	<13
Butylbenzene, tert-	µg/kg	n/v	780,000	12,000,000	-	<0.07	<9.6	<15	<9.5	<10
Carbon Disulfide	µg/kg	n/v	77,000	350,000	-	<2.8	<370	<580	<360	<400
Carbon Tetrachloride (Tetrachloromethane)	µg/kg	247	n/a	2,900	-	<0.14	<19	<29	<18	<20
Chlorobenzene (Monochlorobenzene)	µg/kg	273,000	n/a	130,000	-	<0.08	<10	<16	<10	<11
Chlorobromomethane	µg/kg	129,000	n/a	63,000	-	<0.12	<17	<26	<16	<18
Chloroethane (Ethyl Chloride)	µg/kg	n/v	1,400,000	5,700,000	-	<0.28	<37	<57	<36	<40
Chloroform (Trichloromethane)	µg/kg	n/v	320	1,400	-	<0.09	<11	<18	<11	<12
Chloromethane	µg/kg	n/v	11,000	46,000	-	<0.57	<76	<120	<75	<81
Chlorotoluene, 2-	µg/kg	n/v	160,000	2,300,000	-	<0.12	<16	<24	<15	<17
Chlorotoluene, 4-	µg/kg	n/v	160,000	2,300,000	-	<0.07	<8.8	<14	<8.7	<9.4
Dibromo-3-Chloropropane, 1,2- (DBCP)	µg/kg	3.27	n/a	64	-	<0.61	<81	<130	<80	<87
Dibromochloromethane	µg/kg	n/v	8,300	39,000	-	<0.09	<11	<18	<11	<12
Dibromomethane (Methylene Bromide)	µg/kg	n/v	2,400	9,900	-	<0.15	<19	<30	<19	<21
Dichloro-2-Butene, trans-1,4-	µg/kg	n/v	7.4	32	-	<0.87	<120	<180	<110	<120
Dichlorobenzene, 1,2-	µg/kg	n/v	180,000	930,000	-	<0.09	<12	<18	<12	<12
Dichlorobenzene, 1,3-	µg/kg	n/v	n/v	n/v	-	<0.09	<12	<19	<12	<13
Dichlorobenzene, 1,4-	µg/kg	n/v	2,600	11,000	-	<0.10	<14	<22	<14	<15
Dichlorobutane, 1,4-	µg/kg	n/v	n/v	n/v	-	<0.14	<18	<29	<18	<20
Dichlorodifluoromethane (Freon 12)	µg/kg	n/v	8,700	37,000	-	<0.56	<74	<120	<74	<80
Dichloroethane, 1,1-	µg/kg	n/v	3,600	16,000	-	<0.09	<12	<18	<12	<13
Dichloroethane, 1,2-	µg/kg	175	n/a	2,000	-	<0.16	<21	<33	<21	<22
Dichloroethene, 1,1-	µg/kg	n/v	23,000	100,000	-	<0.15	<19	<30	<19	<21
Dichloroethene, cis-1,2-	µg/kg	146,000	n/a	230,000	-	<0.11	<14	<22	<14	<15
Dichloroethene, trans-1,2-	µg/kg	1,460,000	n/a	2,300,000	-	<0.08	<11	<17	<11	<12
Dichloroethene-1,2- (sum)	µg/kg	n/v	n/v	n/v	-	<0.08	<11	<17	<11	<12
Dichloropropane, 1,2-	µg/kg	n/v	1,600	6,600	-	<0.08	<10	<16	<10	<11
Dichloropropane, 1,3-	µg/kg	n/v	160,000	2,300,000	-	<0.10	<14	<21	<13	<14
Dichloropropane, 2,2-	µg/kg	n/v	n/v	n/v	-	<0.12	<16	<26	<16	<18
Dichloropropene, 1,1-	µg/kg	n/v	n/v	n/v	-	<0.10	<13	<20	<13	<14
Dichloropropene, 1,3- (sum of isomers cis + trans)	µg/kg	n/v	1,800	8,200	-	<0.10	<13	<20	<13	<14
Dichloropropene, cis-1,3-	µg/kg	n/v	n/v	n/v	-	<0.10	<13	<20	<13	<14
Dichloropropene, trans-1,3-	µg/kg	n/v	n/v	n/v	-	<0.17	<22	<35	<22	<24
Ethyl Ether (Diethyl ether)	µg/kg	n/v	1,600,000	23,000,000	-	<0.21	<28	<43	<27	<30
Ethyl Methacrylate	µg/kg	n/v	180,000	760,000	-	<0.97	<130	<200	<130	<140
Ethylbenzene	µg/kg	2,210	n/a	25,000	-	<0.09	<11	<18	<11	<12
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/kg	n/v	36	160	-	<0.17	<23	<35	<22	<24
Hexachlorobutadiene (Hexachloro-1,3-butadiene)	µg/kg	n/v	1,200	5,300	-	<0.10	<14	<21	<14	<15
Hexanone, 2- (Methyl Butyl Ketone)	µg/kg	n/v	20,000	130,000	-	<0.72	<96	<150	<95	<100
Isopropylbenzene	µg/kg	n/v	190,000	990,000	-	<0.07	<8.8	<14	<8.8	<9.5
Isopropyltoluene, p- (Cymene)	µg/kg	n/v	n/v	n/v	-	<0.07	<8.8	<14	<8.8	<9.5
Methyl Ethyl Ketone (MEK) (2-Butanone)	µg/kg	26,000,000	n/a	19,000,000	-	<1.4	<180	<280	<180	<190
Methyl Isobutyl Ketone (MIBK)	µg/kg	n/v	3,300,000	14,000,000	-	<0.78	<100	<160	<100	<110
Methyl tert-butyl ether (MTBE)	µg/kg	n/v	47,000	210,000	-	<0.12	<16	<26	<16	<18
Methylene Chloride (Dichloromethane)	µg/kg	n/v	35,000	320,000	-	<1.4	<180	<290	<180	<200

Table 7
Summary of Soil Analytical Results
Corrective Action Plan
Yellow Barn
281 VT Route 15 West
Hardwick, Vermont

Sample Location		VSL	USEPA RSL		SB-8		SS-1		SS-2	
Sample Date					25-Mar-19	25-Mar-19	29-Mar-19	29-Mar-19	29-Mar-19	29-Mar-19
Sample ID					SB-8 (0.5-1.5)	SB-8 (10-14)	SS-1 (0-0.5)	SS-1 (3.0-3.5)	SS-2 (0-0.5)	SS-2 (36-43)
Sample Depth		Residential	Residential	Industrial	0.5 - 1.5 ft	10 - 14 ft	0 - 0.5 ft	3 - 3.5 ft	0 - 0.5 ft	3.0 - 3.6 ft
Sample Type	Units	A	B	C	Primary	Primary	Primary	Primary	Primary	Primary
Naphthalene	µg/kg	1,420	n/a	17,000	-	<0.40	<53	<82	<52	<57
Propylbenzene, n-	µg/kg	n/v	380,000	2,400,000	-	<0.10	<14	<22	<14	<15
Styrene	µg/kg	n/v	600,000	3,500,000	-	<0.12	<16	<25	<16	<17
Tetrachloroethane, 1,1,1,2-	µg/kg	n/v	2,000	8,800	-	<0.08	<11	<17	<11	<12
Tetrachloroethane, 1,1,2,2-	µg/kg	n/v	600	2,700	-	<0.10	<13	<21	<13	<14
Tetrachloroethene (PCE)	µg/kg	1,460	n/a	39,000	-	<0.12	<16	<25	<16	<17
Tetrahydrofuran	µg/kg	n/v	1,800,000	9,400,000	-	<0.98	<130	<200	<130	<140
Toluene	µg/kg	4,640,000	n/a	4,700,000	-	<0.33	<44	<69	<44	<47
Trichlorobenzene, 1,2,3-	µg/kg	n/v	6,300	93,000	-	<0.20	<26	<41	<26	<28
Trichlorobenzene, 1,2,4-	µg/kg	n/v	5,800	26,000	-	<0.17	<22	<34	<22	<24
Trichloroethane, 1,1,1-	µg/kg	n/v	810,000	3,600,000	-	<0.10	<14	<21	<13	<14
Trichloroethane, 1,1,2-	µg/kg	n/v	150	630	-	<0.16	<22	<34	<21	<23
Trichloroethene (TCE)	µg/kg	442	n/a	1,900	-	<0.08	<11	<17	<11	<12
Trichlorofluoromethane (Freon 11)	µg/kg	n/v	2,300,000	35,000,000	-	<0.43	<56	<88	<56	<61
Trichloropropane, 1,2,3-	µg/kg	3.24	n/a	110	-	<0.08	<10	<16	<10	<11
Trimethylbenzene, 1,2,4-	µg/kg	264,000	n/a	180,000	-	<0.20	<27	<42	<27	<29
Trimethylbenzene, 1,3,5-	µg/kg	264,000	n/a	150,000	-	<0.12	<16	<24	<16	<17
Total Trimethylbenzenes	µg/kg	264,000	n/v	n/v	-	0	0	0	0	0
Vinyl Acetate	µg/kg	n/v	91,000	380,000	-	<1.3	<170	<270	<170	<190
Vinyl Chloride	µg/kg	n/v	59	1,700	-	<0.20	<27	<42	<27	<29
Xylene, m & p-	µg/kg	n/v	n/v	n/v	-	<0.34	<45	<71	<45	<49
Xylene, o-	µg/kg	n/v	65,000	280,000	-	<0.18	<24	<37	<23	<25
Xylenes, Total	µg/kg	575,000	n/a	250,000	-	<0.18	<24	<37	<23	<25

Notes:

VSL	Vermont Screening Levels, Investigation and Remediation of Contaminated Properties Rule, July 27, 2017 (Ap[illegible]
A	Vermont Soil Screening Levels
USEPA RSL	United States Environmental Protection Agency Regional Screening Levels (RSLs)
B	Resident Soil Screening Levels (TR=1E-06, THQ=0.1) (May 2018)
C	Industrial Soil Screening Levels (TR=1E-06, THQ=0.1) (May 2018)
6.5	Concentration exceeds the indicated standard A.
6.5	Concentration exceeds the indicated standard C.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Non-detect value exceeds the most stringent of all criteria.
<0.03	Analyte was not detected at a concentration greater than the laboratory method detection limit.
n/a	Vermont Screening Levels (VSLs) for residential soil concentrations used; EPA Residential RSL not applicable.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
TEQ	Toxic Equivalence Quotient
TPH	Total petroleum hydrocarbons
	Soil results are reported on a dry-weight basis.
	Total Trihalomethanes: comprised of bromodichloromethane, bromoform, chloroform, and dibromochlorometha
	Total Trimethylbenzenes: 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene.

Data Validation Qualifiers:

J The reported result is an estimated value.

Table 8
Summary of Groundwater Analytical Results
Corrective Action Plan
Yellow Barn
281 VT Route 15 West
Hardwick, Vermont

Sample Location			TW-1	TW-2	TW-3	TW-4		TW-5	TW-8
Sample Date		VSL	27-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19	28-Mar-19	28-Mar-19
Sample ID		A	TW-1	TW-2	TW-3	TW-4	DUP-GW	TW-5	TW-8
Sample Type	Units		Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary
Total Metals (6020B/7470A)									
Arsenic	mg/L	0.01	**0.00084**	**0.00085**	**0.00317**	**0.00711**	**0.00744**	**0.00259**	**0.00042 J**
Barium	mg/L	2.0	**0.00104**	**0.00423**	**0.03004**	**0.1208**	**0.1248**	**0.01632**	**0.00693**
Cadmium	mg/L	0.005	<0.00005	<0.00005	**0.00012 J**	**0.00022**	**0.00025**	**0.00008 J**	<0.00005
Chromium	mg/L	0.10	**0.00069 J**	**0.00114**	**0.00094 J**	**0.01144**	**0.01366**	**0.00179**	**0.00097 J**
Lead	mg/L	0.015	<0.00034	**0.00035 J**	<0.00034	**0.00742**	**0.00784**	**0.00366**	<0.00034
Mercury	mg/L	0.002	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Selenium	mg/L	0.05	<0.00173	<0.00173	<0.00173	<0.00173	<0.00173	<0.00173	<0.00173
Silver	mg/L	0.05	<0.00016	<0.00016	<0.00016	<0.00016	<0.00016	<0.00016	<0.00016
Pesticides (8081B)									
Aldrin	µg/L	0.05	<0.002	<0.002	-	-	-	-	<0.002
BHC, alpha-	µg/L	n/v	<0.003	<0.003	-	-	-	-	<0.003
BHC, beta-	µg/L	n/v	<0.004	<0.004	-	-	-	-	<0.004
BHC, delta-	µg/L	n/v	<0.003	<0.003	-	-	-	-	<0.003
Camphechlor (Toxaphene)	µg/L	3.0	<0.045	<0.045	-	-	-	-	<0.045
Chlordane (Total)	µg/L	2.0	<0.033	<0.033	-	-	-	-	<0.033
Chlordane, alpha-	µg/L	n/v	<0.005	<0.005	-	-	-	-	<0.005
Chlordane, trans- (gamma-Chlordane)	µg/L	n/v	<0.004	<0.004	-	-	-	-	<0.004
DDD (p,p'-DDD)	µg/L	n/v	<0.003	<0.003	-	-	-	-	<0.003
DDE (p,p'-DDE)	µg/L	n/v	<0.003	<0.003	-	-	-	-	<0.003
DDT (p,p'-DDT)	µg/L	n/v	<0.003	<0.003	-	-	-	-	**0.019 J**
Dieldrin	µg/L	0.02	<0.003	<0.003	-	-	-	-	<0.003
Endosulfan I	µg/L	n/v	<0.002	<0.002	-	-	-	-	<0.002
Endosulfan II	µg/L	n/v	<0.004	<0.004	-	-	-	-	<0.004
Endosulfan Sulfate	µg/L	n/v	<0.003	<0.003	-	-	-	-	<0.003
Endrin	µg/L	2.0	<0.003	<0.003	-	-	-	-	<0.003
Endrin Aldehyde	µg/L	n/v	<0.006	<0.006	-	-	-	-	<0.006
Endrin Ketone	µg/L	n/v	<0.003	<0.003	-	-	-	-	<0.003
Heptachlor	µg/L	0.4	<0.002	<0.002	-	-	-	-	<0.002
Heptachlor Epoxide	µg/L	0.2	<0.003	<0.003	-	-	-	-	<0.003
Lindane (Hexachlorocyclohexane, gamma)	µg/L	0.2	<0.003	<0.003	-	-	-	-	<0.003
Methoxychlor (4,4'-Methoxychlor)	µg/L	40	<0.005	<0.005	-	-	-	-	<0.005
Herbicides (8151A)									
2,4,5-TP (Silvex)	µg/L	50	<0.539	<0.539	-	-	-	-	<0.539
2,4-DB	µg/L	n/v	<0.729	<0.729	-	-	-	-	<0.729
Dicamba	µg/L	189	<0.243	<0.243	-	-	-	-	<0.243
Dichlorophenoxy acetic acid, 2,4- (2,4-D)	µg/L	70	<0.498	<0.498	-	-	-	-	<0.498
Dichloropropionic acid, 2,2- (Dalapon)	µg/L	200	<0.810	<0.810	-	-	-	-	<0.810
Dichlorprop	µg/L	140	<0.564	<0.564	-	-	-	-	<0.564
Dinitrobutyl Phenol (Dinoseb)	µg/L	7.0	<0.573	<0.573	-	-	-	-	<0.573
MCPA (2-Methyl-4-Chlorophenoxyacetic Acid)	µg/L	10	<63.2	<63.2	-	-	-	-	<63.2
MCPP (2-(2-Methyl-4-chlorophenoxy) propionic acid)	µg/L	n/v	<58.5	<58.5	-	-	-	-	<58.5
Trichlorophenoxy acetic acid, 2,4,5- (2,4,5-T)	µg/L	70	<0.531	<0.531	-	-	-	-	<0.531
Polycyclic Aromatic Hydrocarbons (8270D-SIM)									
Acenaphthene	µg/L	n/v	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Acenaphthylene	µg/L	n/v	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Anthracene	µg/L	2,100	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Benzo(a)anthracene	µg/L	n/v	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)pyrene	µg/L	0.2	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Benzo(b)fluoranthene	µg/L	n/v	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(g,h,i)perylene	µg/L	n/v	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Benzo(k)fluoranthene	µg/L	n/v	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Chloronaphthalene, 2-	µg/L	n/v	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Chrysene	µg/L	n/v	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Dibenzo(a,h)anthracene	µg/L	n/v	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Fluoranthene	µg/L	280	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Fluorene	µg/L	280	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Indeno(1,2,3-cd)pyrene	µg/L	n/v	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Methylnaphthalene, 1-	µg/L	n/v	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Methylnaphthalene, 2-	µg/L	n/v	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	µg/L	20	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Phenanthrene	µg/L	n/v	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	µg/L	n/v	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Benzo(a)pyrene TEQ	µg/L	0.2	0	0	0	0	0	0	0
Volatile Organic Compounds (8011/8260C)									
Acetone	µg/L	700	<1.5	**2.2 J**	**1.6 J**	**8.1**	**7.4**	<1.5	<1.5
Acrylonitrile	µg/L	n/v	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
Benzene	µg/L	5.0	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Bromobenzene	µg/L	n/v	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Bromodichloromethane	µg/L	80	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Bromoform (Tribromomethane)	µg/L	80	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Bromomethane (Methyl bromide)	µg/L	10	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	**0.26 UB**
Butylbenzene, n-	µg/L	n/v	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Butylbenzene, sec- (2-Phenylbutane)	µg/L	n/v	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Butylbenzene, tert-	µg/L	n/v	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Carbon Disulfide	µg/L	n/v	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride (Tetrachloromethane)	µg/L	5.0	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Chlorobenzene (Monochlorobenzene)	µg/L	100	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Chlorobromomethane	µg/L	90	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Chloroethane (Ethyl Chloride)	µg/L	n/v	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Chloroform (Trichloromethane)	µg/L	80	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Chloromethane	µg/L	30	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorotoluene, 2-	µg/L	100	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Chlorotoluene, 4-	µg/L	100	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Dibromo-3-Chloropropane, 1,2- (DBCP)	µg/L	n/v	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35
Dibromochloromethane	µg/L	80	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Dibromomethane (Methylene Bromide)	µg/L	n/v	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36
Dichloro-2-Butene, trans-1,4-	µg/L	n/v	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
Dichlorobenzene, 1,2-	µg/L	600	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Dichlorobenzene, 1,3-	µg/L	600	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Dichlorobenzene, 1,4-	µg/L	75	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Dichlorobutane, 1,4-	µg/L	n/v	<0.46	<0.46	<0.46	<0.46	<0.46	<0.46	<0.46
Dichlorodifluoromethane (Freon 12)	µg/L	1,000	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Dichloroethane, 1,1-	µg/L	70	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
Dichloroethane, 1,2-	µg/L	5.0	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Dichloroethene, 1,1-	µg/L	7.0	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Dichloroethene, cis-1,2-	µg/L	70	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Dichloroethene, trans-1,2-	µg/L	100	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Dichloroethene-1,2- (sum)	µg/L	n/v	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Dichloropropane, 1,2-	µg/L	5.0	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Dichloropropane, 1,3-	µg/L	0.5	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
Dichloropropane, 2,2-	µg/L	n/v	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dichloropropene, 1,1-	µg/L	n/v	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Dichloropropene, 1,3- (sum of isomers cis + trans)	µg/L	n/v	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Dichloropropene, cis-1,3-	µg/L	n/v	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Dichloropropene, trans-1,3-	µg/L	n/v	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Ethyl Ether (Diethyl ether)	µg/L	n/v	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Ethyl Methacrylate	µg/L	n/v	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61	<0.61
Ethylbenzene	µg/L	700	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/L	0.05	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Hexachlorobutadiene (Hexachloro-1,3-butadiene)	µg/L	n/v	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Hexanone, 2- (Methyl Butyl Ketone)	µg/L	n/v	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52
Isopropylbenzene	µg/L	n/v	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Isopropyltoluene, p- (Cymene)	µg/L	n/v	<0.19	<0.19	**0.24 J**	<0.19	<0.19	<0.19	<0.19
Methyl Ethyl Ketone (MEK) (2-Butanone)	µg/L	4,200	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9

Stantec

Table 8
Summary of Groundwater Analytical Results
Corrective Action Plan
Yellow Barn
281 VT Route 15 West
Hardwick, Vermont

Sample Location			TW-1	TW-2	TW-3	TW-4		TW-5	TW-8
Sample Date		VSL	27-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19	28-Mar-19	28-Mar-19
Sample ID		A	TW-1	TW-2	TW-3	TW-4	DUP-GW	TW-5	TW-8
Sample Type	Units		Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary
Methyl Isobutyl Ketone (MIBK)	µg/L	n/v	<0.42	<0.42	**4.1 J**	<0.42	<0.42	<0.42	<0.42
Methyl tert-butyl ether (MTBE)	µg/L	2.0	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Methylene Chloride (Dichloromethane)	µg/L	5.0	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68
Naphthalene	µg/L	20	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Propylbenzene, n-	µg/L	n/v	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Styrene	µg/L	100	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36
Tetrachloroethane, 1,1,1,2-	µg/L	70	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Tetrachloroethane, 1,1,2,2-	µg/L	n/v	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Tetrachloroethene (PCE)	µg/L	5.0	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Tetrahydrofuran	µg/L	n/v	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52
Toluene	µg/L	1,000	<0.20	<0.20	**0.63 J**	<0.20	<0.20	<0.20	<0.20
Trichlorobenzene, 1,2,3-	µg/L	100	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
Trichlorobenzene, 1,2,4-	µg/L	70	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Trichloroethane, 1,1,1-	µg/L	200	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Trichloroethane, 1,1,2-	µg/L	5.0	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Trichloroethene (TCE)	µg/L	5.0	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Trichlorofluoromethane (Freon 11)	µg/L	2,100	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Trichloropropane, 1,2,3-	µg/L	5.0	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Trimethylbenzene, 1,2,4-	µg/L	350	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Trimethylbenzene, 1,3,5-	µg/L	350	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Total Trimethylbenzenes	µg/L	350	0	0	0	0	0	0	0
Total Trihalomethanes	µg/L	80	0	0	0	0	0	0	0
Vinyl Acetate	µg/L	n/v	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Vinyl Chloride	µg/L	2.0	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Xylene, m & p-	µg/L	n/v	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Xylene, o-	µg/L	n/v	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
Xylenes, Total	µg/L	10,000	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33

Notes:

VSL	Vermont Groundwater Quality Standards, Chapter 12 of the Environmental Protection Rules: Groundwater Protection Rule, dated July 11, 2018. Appendix One, Table 1 (Primary Groundwater Quality Standards).
A	Vermont DEC Groundwater Qualiity Standard
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Non-detect value exceeds the criteria.
<0.03	Analyte was not detected at a concentration greater than the laboratory method detection limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
	Total Trihalomethanes: comprised of bromodichloromethane, bromoform, chloroform, and dibromochloromethane.
	Total Trimethylbenzenes: 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene.

Data Validation Qualifiers:

J — The reported result is an estimated value.

Table 9
Summary of Soil Vapor Analytical Results
Corrective Action Plan
Yellow Barn
281 VT Route 15 West
Hardwick, Vermont

Sample Location Sample Date Sample ID Sample Type	Units	VSL A	SG-1 29-Mar-19 SG-1 Primary	SG-2 29-Mar-19 SG-2 Primary
Volatile Organic Compounds (TO-15)				
Acetone	µg/m3	1,100,000	**15.8**	**36.8**
Allyl chloride (3-Chloropropene)	µg/m3	16	<1.40	<1.51
Benzene	µg/m3	4.3	<1.43	<1.54
Benzyl Chloride	µg/m3	1.9	<2.31	<2.49
Bromodichloromethane	µg/m3	1,400	<2.99	<3.22
Bromoform (Tribromomethane)	µg/m3	85	<4.62	<4.97
Bromomethane (Methyl bromide)	µg/m3	170	<1.74	<1.87
Butadiene, 1,3-	µg/m3	3.1	<0.989	<1.06
Carbon Disulfide	µg/m3	24,000	<1.39	**4.52**
Carbon Tetrachloride (Tetrachloromethane)	µg/m3	16	<2.81	<3.03
Chlorobenzene (Monochlorobenzene)	µg/m3	1,700	<2.06	<2.22
Chloroethane (Ethyl Chloride)	µg/m3	350,000	<1.18	<1.27
Chloroform (Trichloromethane)	µg/m3	4.1	<2.18	<2.35
Chloromethane	µg/m3	3,100	<0.923	<0.993
Cyclohexane	µg/m3	210,000	<1.54	<1.66
Dibromochloromethane	µg/m3	n/v	<3.81	<4.10
Dichlorobenzene, 1,2-	µg/m3	7,000	<2.69	<2.89
Dichlorobenzene, 1,3-	µg/m3	n/v	<2.69	<2.89
Dichlorobenzene, 1,4-	µg/m3	8.5	<2.69	<2.89
Dichlorodifluoromethane (Freon 12)	µg/m3	3,500	<2.21	<2.38
Dichloroethane, 1,1-	µg/m3	58	<1.81	<1.95
Dichloroethane, 1,2-	µg/m3	3.6	<1.81	<1.95
Dichloroethene, 1,1-	µg/m3	7,000	<1.77	<1.91
Dichloroethene, cis-1,2-	µg/m3	n/v	<1.77	<1.91
Dichloroethene, trans-1,2-	µg/m3	n/v	<1.77	<1.91
Dichloroethene-1,2- (sum)	µg/m3	n/v	<1.77	<1.91
Dichloropropane, 1,2-	µg/m3	9.4	<2.07	<2.22
Dichloropropene, 1,3- (sum of isomers cis + trans)	µg/m3	n/v	<2.03	<2.18
Dichloropropene, cis-1,3-	µg/m3	n/v	<2.03	<2.18
Dichloropropene, trans-1,3-	µg/m3	n/v	<2.03	<2.18
Dichlorotetrafluoroethane, 1,2- (Freon 114)	µg/m3	n/v	<3.12	<3.36
Dioxane, 1,4-	µg/m3	19	<1.61	<1.73
Ethanol	µg/m3	n/v	**31.3**	<22.6
Ethyl Acetate	µg/m3	2,400	<4.04	<4.32
Ethylbenzene	µg/m3	37	<1.94	<2.09
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/m3	0.16	<3.44	<3.70
Ethyltoluene, 4-	µg/m3	n/v	<2.20	<2.36
Heptane (C7)	µg/m3	n/v	<1.83	<1.97
Hexachlorobutadiene (Hexachloro-1,3-butadiene)	µg/m3	4.3	<4.77	<5.13
Hexane (n-Hexane)	µg/m3	24,000	<1.58	**2.39**
Hexanone, 2- (Methyl Butyl Ketone)	µg/m3	1,000	<1.83	<1.97
Isopropyl Alcohol (2-Propanol)	µg/m3	7,000	**16.7**	<2.95
Methyl Ethyl Ketone (MEK) (2-Butanone)	µg/m3	170,000	<3.30	**5.75**
Methyl Isobutyl Ketone (MIBK)	µg/m3	100,000	<4.59	<4.92
Methyl tert-butyl ether (MTBE)	µg/m3	360	<1.61	<1.73
Methylene Chloride (Dichloromethane)	µg/m3	3,400	<3.89	<4.17
Naphthalene	µg/m3	1	<2.34	<2.52
Propene	µg/m3	100,000	<1.93	**5.01**
Styrene	µg/m3	35,000	**62.6**	<2.05
Tetrachloroethane, 1,1,2,2-	µg/m3	1.6	<3.07	<3.30
Tetrachloroethene (PCE)	µg/m3	21	<3.03	<3.26
Tetrahydrofuran	µg/m3	70,000	<3.30	<3.54
Toluene	µg/m3	170,000	**2.63**	**2.48**
Trichlorobenzene, 1,2,4-	µg/m3	70	<3.32	<3.57
Trichloroethane, 1,1,1-	µg/m3	170,000	<2.44	<2.62
Trichloroethane, 1,1,2-	µg/m3	5.8	<2.44	<2.62
Trichloroethene (TCE)	µg/m3	6.7	<2.40	<2.59
Trichlorofluoromethane (Freon 11)	µg/m3	n/v	**5.15**	<2.70
Trichlorotrifluoroethane (Freon 113)	µg/m3	1,000,000	<3.43	<3.69
Trimethylbenzene, 1,2,4-	µg/m3	240	<2.20	**3.13**
Trimethylbenzene, 1,3,5-	µg/m3	n/v	<2.20	<2.36
Trimethylpentane, 2,2,4-	µg/m3	n/v	<2.09	<2.25
Vinyl Acetate	µg/m3	7,000	<7.85	<8.45
Vinyl Bromide (Bromoethene)	µg/m3	2.9	<1.95	<2.10
Vinyl Chloride	µg/m3	3.7	<1.14	<1.23
Xylene, m & p-	µg/m3	n/v	<3.88	<4.17
Xylene, o-	µg/m3	n/v	<1.94	<2.09
Xylenes, Total	µg/m3	3,500	<1.94	<2.09

Notes:

VSL	Vapor Intrusion Screening Values - Sub-Slab Soil Gas - Residential, Investigation and Remediation of Contaminated Properties Rule, July 27, 2017 (Appendix A - Vapor Intrusion Values).
A	DEC Soil Gas Target Levels - Residential Soil Gas
16.4	Concentration exceeds the criteria.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Non-detect value exceeds the criteria.
<0.03	Analyte was not detected at a concentration greater than the reporting limit.
n/v	No standard/guideline value.
µg/m3	microgram per cubic meter

APPENDICES

APPENDIX A

Draft Neighboring Parcel Notification Letter

VERMONT
Department of Environmental Conservation

OFFICIAL NOTICE

Hello Neighbor,

This letter is an official notice that the Town of Hardwick, Vermont intends to apply for one or more permits from the Agency of Natural Resources, Department of Environmental Conservation (DEC). Because your property borders the location of the activity as described below, Vermont law requires the applicant to provide you with notice of the application(s).

Once each application has been submitted and deemed complete by DEC to begin the review, it will be posted to the DEC Environmental Notice Bulletin (ENB) at ENB.VERMONT.GOV, where you may register to receive notifications to stay informed as each application moves through the review process. Although the application(s) may not yet be received or processed by the DEC upon receipt of this letter from the applicant below, you may register now to receive notifications using a specified mile/distance radius from your address location *(see next page for detailed instructions on how to register).*

In the meantime, you may also contact the property owner/applicant with questions about the activity using the contact information provided below. For background, the permit process includes a public comment period and an opportunity to request a public meeting, all which can be done through the ENB link above once permit applications are posted. Note that to appeal a final permit decision you must submit comments during the public comment period.

For additional information please visit the following website: DEC.VERMONT.GOV/PERMITS/ENB/GENERAL. For general questions or assistance with registering on the ENB please call DEC's main line at (802) 828-1535 and plan to provide the permit types that are being applied for as listed below.

PROPERTY OWNER(S)/APPLICANT(S) NAME

Town of Hardwick, Vermont

PROPERTY OWNER(S)/APPLICANT(S) CONTACT INFORMATION (MUST PROVIDE TELEPHONE NUMBER AND/OR EMAIL)

Shaun Fielder, Town Manager, shaun.fielder@hardwickvt.org, (802) 472-6120

PROPOSED ACTIVITY STREET ADDRESS/ROUTE

Yellow Barn Site, 281 VT Route 15 West, Hardwick, VT 05836

PROPOSED TOWN(S)

Hardwick, VT

PERMIT TYPE(S) (INDICATE FOR EACH PERMIT TYPE NEW OR RENEWAL)

Corrective Action Plan (New)

VERMONT
Department of Environmental Conservation

To register on the ENB and set up your subscription: please go through the following steps. There are illustrated instructions on Page 12 of the ENB User Guide:

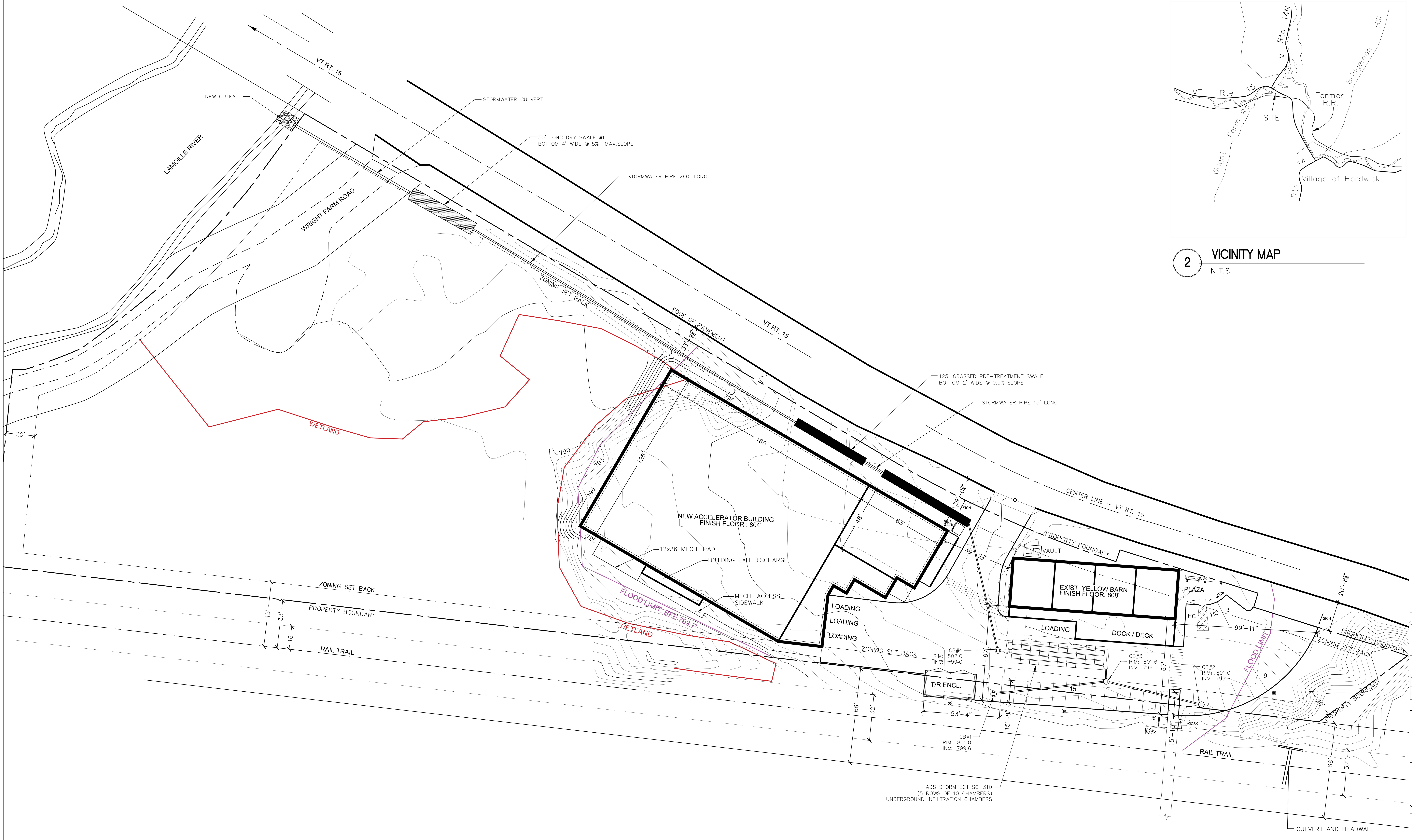
1. Go to ENB.VERMONT.GOV
2. Click **Register** on the upper right-hand side of the home page
3. Enter the required information (name, email address and create password) and click Register
4. You will receive an email confirmation for your email address. Once confirmed you will be able to log-in and set up your subscription.
5. Log into ENB and then click **My Subscription** at the top left-hand side of the home page
6. Click **Modify Alerts** on the My Subscription page
7. Click **Edit** for Alert #1
8. Choose the permits being applied for from the **Activity Types of Interest** list by checking the check boxes.
9. Next, choose the location using **Distance from a Point** and click the map icon to set your location.
10. Enter your own address, including Town in the **Search Address** field and set the distance large enough to capture the project activity (1 mile, 5 miles, etc.)
11. Click **OK** once the radius has been set
12. Click **SAVE** on the next page, then Click **OK** to return the main subscription page.
13. Once you receive an alert for an activity, you can choose to **Follow** the activity from your subscription page.
14. For additional instructions see the **User Guide** on ENB.VERMONT.GOV.
15. For help with registration please contact the ENB Administrator: ANR.ENBAdministrator@vermont.gov.

APPENDIX B

Proposed Site Redevelopment Plans

HARDWICK YELLOW BARN BUSINESS ACCELERATOR

281 VT. RT. 15 HARDWICK VERMONT 05843



1 SITE PLAN
1" = 30'-0"

2 VICINITY MAP
N.T.S.

ARCHITECT
COE + COE ARCHITECTURE
2342 ANDERSONVILLE ROAD
WEST GLOVER, VT 05875
JAMES.N.COE@GMAIL.COM
802.673.4184

PROJECT NUMBER:
2018–15

REV.	STATUS	DATE
	SCHEMATIC	8/1/19

OWNER
TOWN OF HARDWICK
20 CHURCH STREET
HARDWICK VT 05843

PROJECT:
HARDWICK YELLOW BARN BUSINESS ACCELERATOR
Project Manager: JON JEWETT
(802) 793–5627
yellowbarn@hardwickagriculture.org

DRAWN BY: JC
CHECKED BY: JC

COVER SHEET

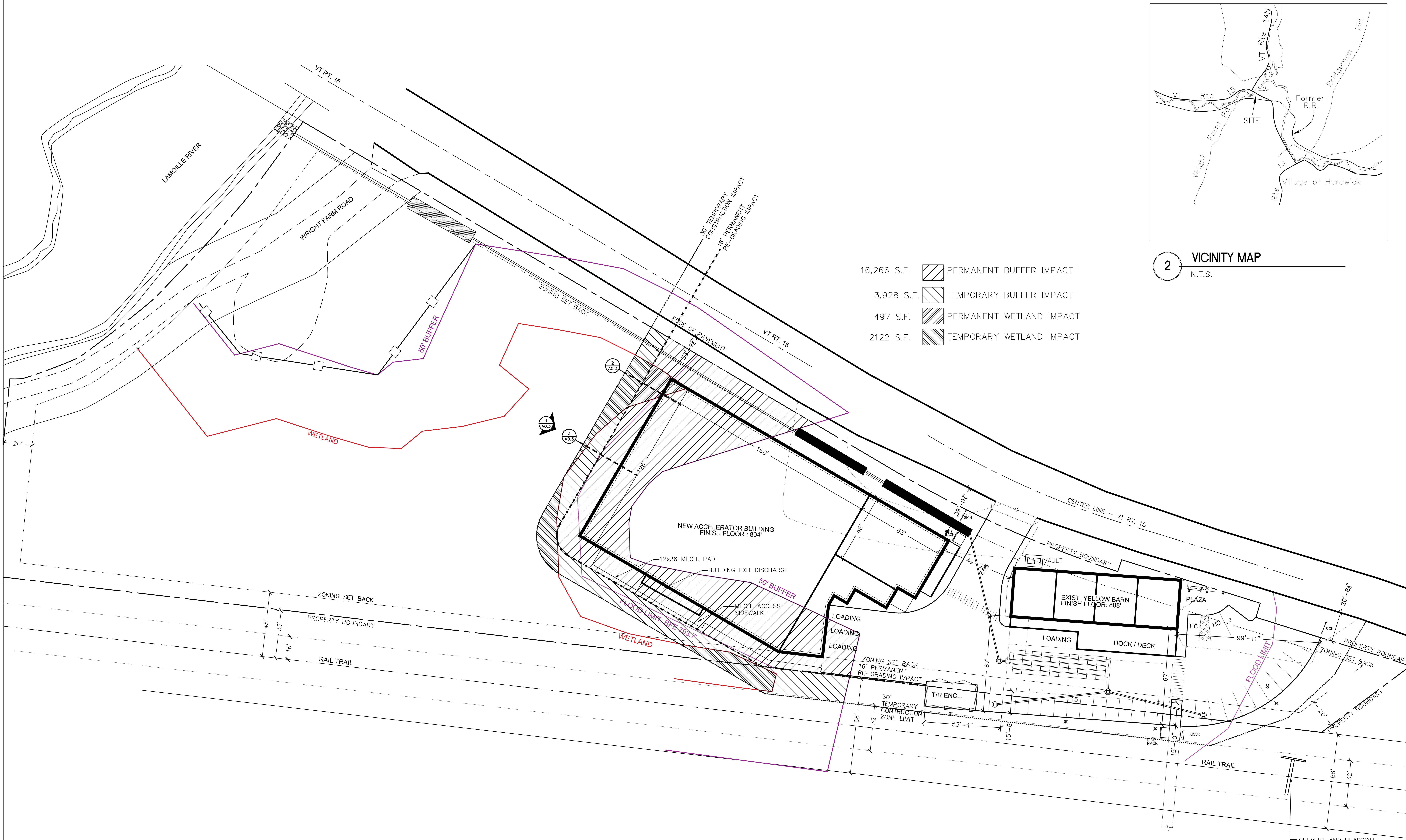
SITE PLAN

A0.1

HARDWICK YELLOW BARN BUSINESS ACCELERATOR

281 VT. RT. 15 HARDWICK VERMONT 05843

2 VICINITY MAP
N.T.S.



1 SITE PLAN
1" = 30'-0"

ARCHITECT
COE + COE ARCHITECTURE
2342 ANDERSONVILLE ROAD
WEST GLOVER, VT 05875
JAMES.N.COE@GMAIL.COM
802.673.4184

PROJECT NUMBER:
2018-15

REV.	STATUS	DATE
	SCHEMATIC	8/1/19

OWNER
TOWN OF HARDWICK
20 CHURCH STREET
HARDWICK VT 05843

PROJECT:
HARDWICK YELLOW BARN BUSINESS ACCELERATOR
Project Manager: JON JEWETT
(802) 793-5627
yellowbarn@hardwickagriculture.org

DRAWN BY:
JC

CHECKED BY:
JC

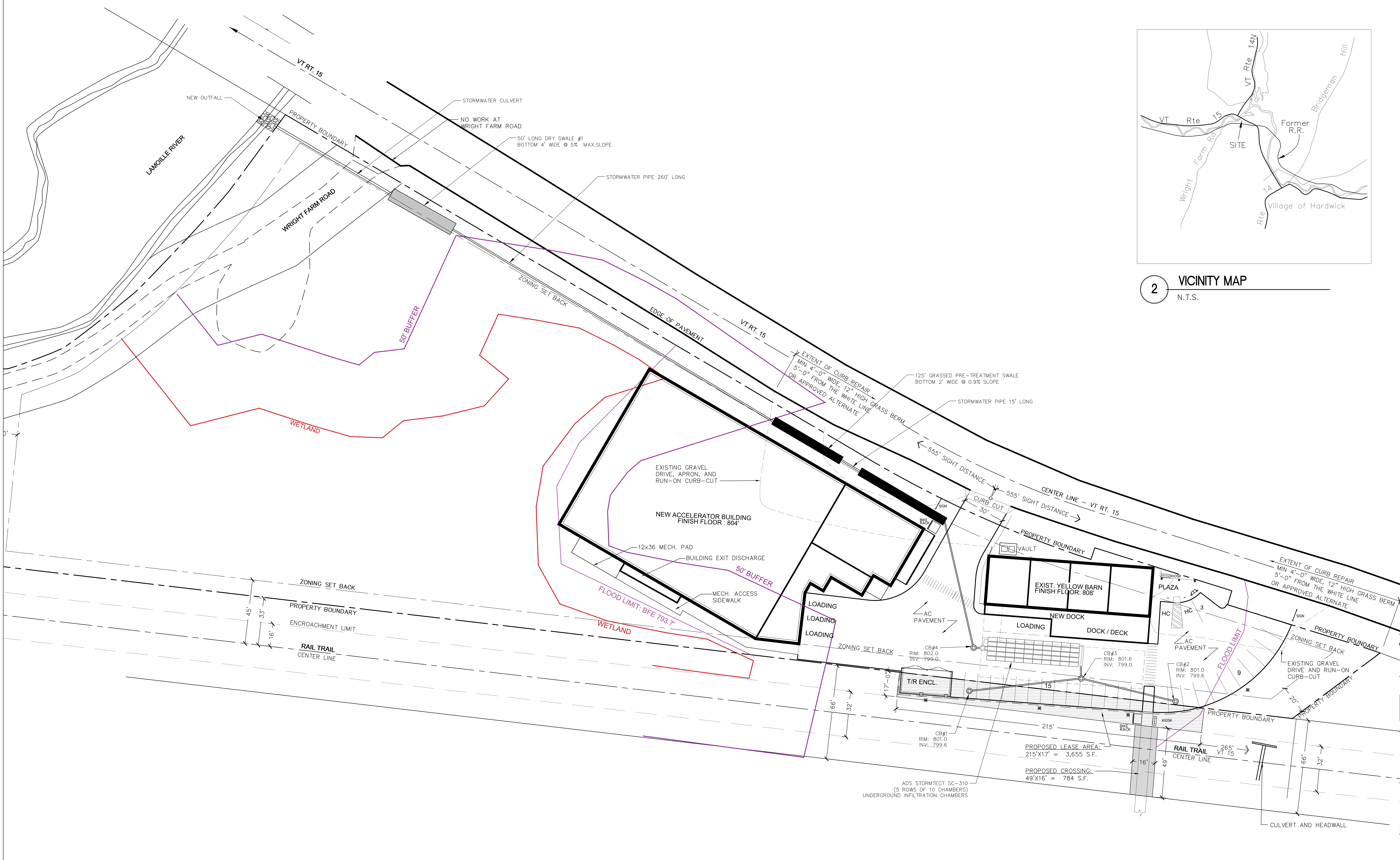
WETLANDS

WETLAND IMPACT SITE PLAN

A0.1

HARDWICK YELLOW BARN BUSINESS ACCELERATOR

281 VT. RT. 15 HARDWICK VERMONT 05843



1 SITE PLAN
1" = 30'-0"
N

2 VICINITY MAP
N.T.S.

ARCHITECT
COE + COE ARCHITECTURE
2342 ANDERSONVILLE ROAD
WEST GLOVER, VT 05875
JAMES.N.COE@GMAIL.COM
802.673.4184

PROJECT NUMBER:
2018-15

REV.	STATUS	DATE
	SCHEMATIC	8/1/19
	REVISED	7/31/19

OWNER
TOWN OF HARDWICK
20 CHURCH STREET
HARDWICK VT 05843

PROJECT:
HARDWICK YELLOW BARN BUSINESS ACCELERATOR
Project Manager: JON JEWETT
(802) 793-5627
yellowbarn@hardwickagriculture.org

DRAWN BY:
JC

CHECKED BY:
JC

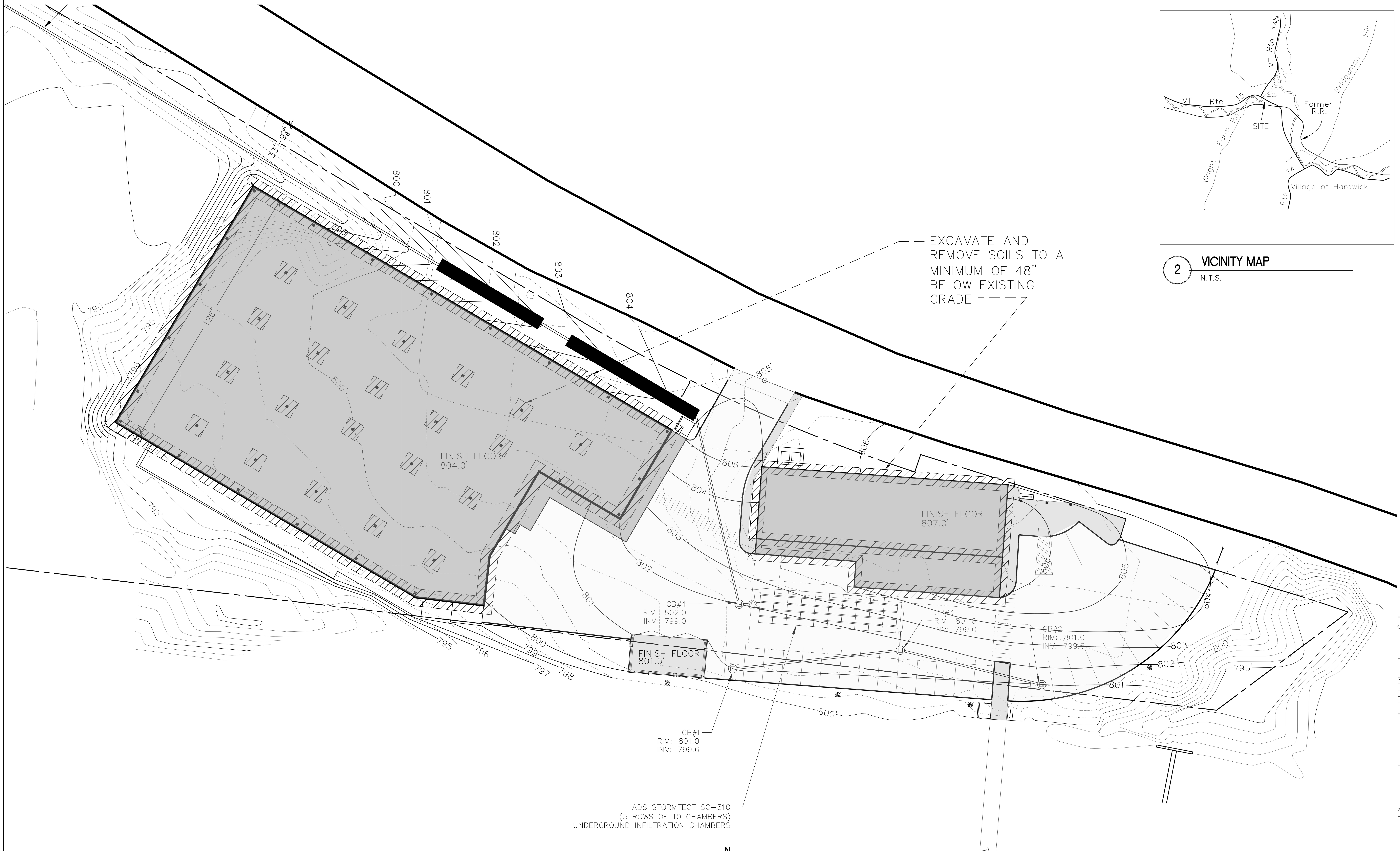
V-TRANS

STATE HIGHWAY SITE PLAN

T0.1

HARDWICK YELLOW BARN BUSINESS ACCELERATOR

281 VT. RT. 15 HARDWICK VERMONT 05843



1 SCHEMATIC GRADING PLAN
1" = 20'-0"
N

2 VICINITY MAP
N.T.S.

ARCHITECT
COE + COE ARCHITECTURE
2342 ANDERSONVILLE ROAD
WEST GLOVER, VT 05875
JAMES.N.COE@GMAIL.COM
802.673.4184

PROJECT NUMBER:
2018-15

REV.	STATUS	DATE
	SCHEMATIC	8/7/19

V-T
WE
HIST

OWNER
TOWN OF HARDWICK
20 CHURCH STREET
HARDWICK VT 05843

PROJECT:
HARDWICK YELLOW BARN BUSINESS ACCELERATOR
Project Manager: JON JEWETT
(802) 793-5627
yellowbarn@hardwickagriculture.org

DRAWN BY:
JC

CHECKED BY:
JC

SCHEMATIC GRADING PLAN

A0.1

APPENDIX C

Annual Institutional Control Inspection Form

VERMONT

LAND USE RESTRICTIONS – ANNUAL INSTITUTIONAL CONTROL INSPECTION FORM

Our records indicate that this property maintains institutional or engineering controls associated with a land use restriction. Please indicate the state of the following controls, as applicable, on the property.

SMS Site #: 2019-4834

Owner Name: 1781 Group LLC

Site/Property Name: The Yellow Barn Site

Site/Property Address: 281 VT Route 15 West Hardwick, VT 05836

	YES	NO	COMMENTS
Paved Caps:			
1. Is there any cracking, fractures, or breaking of the pavement?			
2. Has the pavement been punctured, providing a risk of direct contact?			
Buildings/Structures:			
1. Are there visible cracks or fractures in the foundation?			
2. Have there been additions or improvements to the structure?			
3. Has there been standing water or flood in the basement of the structure (since receipt of the Certificate of Completion)?			
Sub-slab Depressurization System (SSD):			
1. Has the SSD been operational and appropriately maintained for the past year, as described in the Certificate of Completion?			
Soil/Grass Caps:			
1. Is there any evidence of erosion?			
2. Are monitoring wells at the site damaged, un-locatable, or otherwise in unacceptable condition?			
3. Have survey pins been repositioned or removed?			
4. Is there any evidence of burrowing wildlife?			
5. Are there bare spots larger than 3 square feet in grassy areas?			
6. Has there been any subsurface work conducted on the property?			

I certify that I have responded to each of the questions above to the best of my knowledge.

Signature: ______________________ **Date:** ______________

Submit by email or submit original form to the SMS Project Manager at the address listed below:
Vermont Department of Environmental Conservation
Waste Management & Prevention Division/Sites Management Section
1 National Life Drive – Davis 1
Montpelier, VT 05620-3704

SMS Project Manager: Sarah Bartlett

Clear Form

APPENDIX D

Standard Operating Procedures

APPENDIX D TABLE OF CONTENTS
Field SOPs

SOP No.	Title	Location
ES-RR&IH-001	Soil Sampling	Generic QAPP
ES-RR&IH-002	Decontamination Procedures	Generic QAPP
ES-RR&IH-008	Waste Sampling	Generic QAPP
ESPA-011	Field Notebook	Generic QAPP
10.9	Chain of Custody Procedures	Limited Phase II Work Plan, Yellow Barn Site, Hardwick, VT

SOP 7.8
DIRECT PUSH DRILLING

1.0 PURPOSE

Direct push drilling techniques (commonly referred to as Geoprobe® drilling) are generally employed to advance a soil boring to obtain subsurface information and to install overburden monitoring wells. Typically, direct push drilling is completed to obtain soil information related to environmental contamination and can be less expensive and more efficient than hollow stem auger (HSA) drilling for collecting soil information. However, monitoring well installation is typically not as efficient due to boring collapse and the construction of monitoring wells can be compromised. Note that Standard Penetration Test (SPT) soil sampling cannot be preformed using this method and therefore soil density information cannot be obtained.

2.0 HEALTH AND SAFETY

As described in the general drilling standard operation procedure (SOP), Stantec SOP 7.0, health and safety procedures to be following shall be documented in the site-specific health and safety plan.

3.0 EQUIPMENT

a. Industry-standard drilling equipment.

- Drill rig capable of required site access.
- Drill rig capable of performing direct push techniques.

b. Typical Sampling Equipment.

- Macrocore® sampler liner in four- or five-foot lengths

4.0 DRILLING PROCEDURES

Advancement of the boring is completed using a drive point attached to hollow drill rods. A Macrocore® sampler liner is inserted into the drill rods and a drive cap is placed on top of the drill rods. The drill rods are then driven the length of the rod (typically four- or five-feet below grade) using a pneumatic hammer collecting a soil sample simultaneously. The drill rods are then removed from the boring using the drill head and the sampler liner is extracted from the rods manually. This process is repeated until the desired total depth is reached, or refusal is encountered.

5.0 WELL INSTALLATION PROCEDURES

Once the desired depth is reached to install a monitoring well, based on observations of saturated soils during sampling, a measured depth to groundwater inside the boring (after removal of the drill rods), or a combination of these observations, a monitoring well can be installed. Typically, nominal one-inch diameter monitoring wells are installed; however, 2-inch monitoring wells can be installed.

To install the well, the driller removes the drill rods and soil sample from the boring and inserts the polyvinyl chloride (PVC), stainless steel, or other well material into the boring to the total depth of the boring, with the top of the well slightly below the planned elevation of the protective casing. If the protective casing to be used is a standpipe (or casing installed above the ground surface), the well material typically extends 2 to 4 feet above the ground surface. If the protective casing to be used is a flush-mounted road box, the well material typically extends to approximately less than one inch below the ground surface. Once the well material is in place, annular materials are cautiously added to the boring while the driller using a weighted tape measure to gauge the depth of annular materials. Since the drill rods must be removed to entirely to install the well, borehole collapse (particularly for granular materials) is common. The Stantec representative shall require the driller to measure the depth of the annular space following well material placement to gauge the extent of borehole collapse. The Stantec representative shall also instruct the driller to identify additional areas of borehole collapse during well construction, if observed.

An alternative method for well installation using direct push drilling techniques is available, if larger boring diameters are completed. The driller can install casing of various sizes to the base of the boring after removing the drill rods. However, borehole collapse may occur prior to installation of casing. If installing a monitoring well using casing, the driller will install the casing to the total depth of the boring, and then will install the monitoring well material to the total depth of the boring. The total depth of the annular space shall then be measured to gauge borehole collapse. The casing will then be raised a short distance (approximately 2 feet) and annular materials (e.g., sand, bentonite) will be placed in the boring up to the depth of the current base of casing (as measured by the driller). The casing will then be raised a short distance followed by further addition of annular materials. This process will be repeated until the bentonite seal is placed, when the casing can be entirely removed from the boring and the well can be completed at the surface as described above.

6.0 DECONTAMINATION

Decontamination procedures should be employed whenever environmental monitoring wells are installed or environmental sampling is being performed. Decontamination procedures shall be followed in accordance with the general drilling SOP, Stantec SOP 7.0. Note that based on the required procedure to complete direct push drilling, drill rods cannot be effectively decontaminated between sample intervals, due to the extraction and insertion of the entire drill string for each sample collection interval. Therefore, decontamination procedures described in other Stantec SOPs for soil sample collection while drilling do not apply to this method.

7.0 DOCUMENTATION/LOG

Documentation of each day's progress, site visits by personnel, and general site occurrences shall be kept in a field log as described in Stantec SOP 7.0. Boring / monitoring well logs shall also be completed in accordance with Stantec SOP 7.0, where applicable (i.e., blow counts shall not be recorded since SPT sampling cannot be performed).

8.0 QA/QC PROCEDURES

As described in the general drilling SOP (Stantec SOP 7.0), quality assurance / quality control (QA/QC) procedures to be followed shall be described in the site-specific or general quality assurance project plan (QAPP).

SOP 10.8
GAS SAMPLING

1.0 PROCEDURE FOR GAS SAMPLING FROM GAS MONITORING PROBES

1.1 Purpose

The purpose of this procedure is to establish uniform guidelines for collection of gas samples, from the gas monitoring probes.

1.2 Definitions

Summa Passivated Cylinder: A stainless steel cylinder with an inlet valve where the surfaces which contact the sample have been conditioned to reduce reactivity of the sample.

Vacuum Flow Regulator: A flow regulator which attaches to the Summa Cylinder and allows the air sample to enter the cylinder at a controlled rate. A vacuum gauge is attached to the flow regulator.

1.3 Equipment

The following equipment and materials are required to perform this procedure:

- Sample location map;
- Keys for well locks;
- Landfill Gas Monitoring Data Sheets;
- Combustible Gas Indicator (Methane, O_2, CO_2);
- Pressure Gauge;
- Appropriate tubing and connectors;
- Summa passivated cylinders equipped with vacuum flow regulators and vacuum gauges;
- Battery operated sampling pump capable of drawing 1 liter of air per minute through 10 ml of absorbing solution;
- Calibrated glass Microimpinger with absorbing solution;
- Air ultra zero; and
- Teflon or stainless steel tubing and connections for summa canisters

1.4 Procedures

1.4.1 Vacuum and Total Combustable Gas Measurements

- Unlock the lid to the probe cover, and asses the head of the gas probe for damage. Note accordingly.
- Record the probe reference number, the date of sampling and the name of the sampler in field book.
- Record the type of monitoring instruments and date and time of most recent calibration on the data sheet.
- Calibrate all sampling equipment including flow regulator to manufacturers specifications. Equipment that does not meet calibration shall be replaced or repaired to meet calibration requirements.
- Note current weather conditions, ground conditions, and other pertinent information.
- Attach the pressure gauge lead tube to the quick-connect coupling on the well cap. Measure the pressure and record in field book.
- Remove the lead tube of the pressure gauge from the quick-connect coupling.
- Connect the lead tube of the combustible gas indicator to the quick-connect coupling on the PVC end cap and switch the combustible gas indicator to the HIGH scale. Turn on the instrument pump and record the MAXIMUM percent methane. If the percent methane is less than five percent on the HIGH scale switch the methane indicator to the LOW scale. Record the MAXIMUM percent methane on the LOW scale. Follow similar procedure for percent O_2 and CO_2.

- Remove the lead tube of the combustible gas indicator. Purge the combustible gas indicator with fresh air and turn the instrument off.

1.4.2 Collection of Summa Canister Samples

The analytical laboratory will have prepared (cleaned) the Summa canisters and calibrated the inlet flow rate prior to sampling. The vacuum pressure of the canister should be checked prior to sampling to ensure that it has not leaked during transit from the laboratory to the site. Chain-of-custody documentation should also be reviewed and completed in accordance with the QAPP.

Attach a length of Teflon or stainless steel tubing to the brass fitting at the top of the riser pipe and connect the other end to the Summa canister inlet using Swagelock (or equivalent) compression fittings. The end of the tubing should extend 12 inches upstream of the vent access port which should be sealed during sampling.

The inlet to the Summa canister should be opened to begin sampling. Sampling will proceed without the need for any operator attendance. At the end of the designated sampling period (usually

8 or 24 hours depending upon the size of the canister and the sampling flow rate) the inlet valve to the canister should be closed and the vacuum pressure in the canister recorded.

The canister should be shipped to the laboratory in accordance with the chain-of-custody procedures given in the QAPP. Special care should be used when handling and packing the canister to prevent damage to the valves.

Notes should be kept of the date and time that sampling was initiated and terminated at each location, weather conditions such as cloud cover, temperature, humidity, precipitation (including any recent precipitation prior to sampling), and barometric pressure. All notes and paperwork should include the project name and number, the samplers name, and the date.

1.4.3 Microimpinger Samples

The analytical laboratory will prepare each impinger with 10 ml of the absorbing solution. The laboratory shall also provide at least one extra impinger to be used for calibration of the sampling flow rate.

Connect a length of teflon or stainless steel tubing to the top of the gas monitoring probe using a Swagelock (or equivalent) compression fitting. Connect the other end of the tubing to the inlet of the impinger. The sampling pump should be located downstream of the impinger.

Prior to initiating sampling, the extra impinger should be used to calibrate the flow rate, set the sampling flow rate at 1 liter per minute (lpm). Following calibration, remove the impinger used for calibration and replace it with the impinger to be used for sample collection. Draw the sample through the impinger at a flow rate of 1 lpm for a period of 10 to 15 minutes. At the end of the sampling period record the flow rate, length of the sampling period and the total volume of the gas sampled on the chain-of-custody form and in the field book. Ship the impinger to the laboratory with the chain-of-custody procedures given in the QAPP.

SOP 10.9
SAMPLE CUSTODY PROCEDURES

1.0 Purpose

Stantec's procedures for sample-type identifications, handling, shipping, chain-of-custody, and related matters are presented in this section of the document. The purpose of these procedures is to maintain the integrity (i.e., quality) of all samples during collection, transportation, analysis and reporting. The sample numbering procedure for identifying individual samples is described below. Procedures stated herein are necessary to validate the history of sample data collection through reporting by providing adequate documentation.

Samples are physical evidence collected from a facility or the environment. Sample data generated during environmental projects may be used as evidence in legal enforcement proceedings. In support of potential litigation, chain-of-custody procedures have been established to ensure sample traceability from the time of collection through completion of analysis.

2.0 Sample Identification and Handling

The sample identification scheme will be determined by the Project Manager or field personnel in charge of sampling and testing. Sample identification should be assigned in such a way that two separate sample identification parts could be used to determine a sample's true identity if part of the sample identification is either misread or obliterated. For example, a sample identification that includes the date of sampling and the sample sequence number would satisfy the above criteria.

Each sample bottle should be labeled with the sample identification number, project name or identification, the sampler's name and Stantec's (as the laboratory's client), the sample date and time (military time), the requested analysis, and any preservatives added to the sample.

3.0 Custody Procedures and Documentation

Sample identification documents must be carefully prepared so that identification and chain-of-custody can be maintained, and sample deposition can be controlled. The sample identification documents utilized by Stantec identifying samples will be:

* Sample tags/labels;
* Chain-of-custody records;
* Custody seals; and
* Field notebooks.

4.0 Chain-of-Custody

A chain-of-custody procedure is followed to document sample possession. The procedures used by Stantec are outlined in the paragraphs below. Chain-of-custody is usually initiated at the laboratory when sample containers are prepared and shipped to the project site. Sometimes chain-of-custody is initiated in the field by the sampling team. When chain-of-custody is initiated at the laboratory, the laboratory personnel responsible for shipping sampling containers will have initiated and signed the chain-of-custody form and sealed the shipping container with a chain-of-custody seal. It is preferable for the custody seal to be signed and dated by the laboratory and to have a unique serial number which is recorded on the chain-of-custody form by the lab. In such cases, field staff should check this information to assess the potential for tampering with sample containers prior to receipt in the field. The field staff should acknowledge receipt and container integrity by signing the chain-of-custody form, and noting any discrepancies.

It is preferable to use laboratory-supplied sample containers. However, if a situation arises where the field team uses any sample containers not supplied by the laboratory (such as pre-cleaned and certified I-Chem bottles), this should be noted on the chain-of-custody form for the particular samples in question. It should be noted that the laboratory might not stand by the reliability of the analyses if non laboratory-supplied sample containers are used.

Samples and sample containers must be kept under proper chain-of-custody during field sampling. The National Enforcement Investigations Center (NEIC) of USEPA considers a sample in custody under the following conditions:

1. It is in your actual possession, or

2. It is in your view, after being in your physical possession, or

3. It was in your possession and then you locked or sealed it to prevent tampering, or

4. It is in a secure area (such as a locked site trailer, or a locked site vehicle).

Field Custody Procedures - Enough samples are collected to provide a good representation of the media being sampled. To the extent possible, the quantity and types of samples and sample locations are determined before the actual field work. As few people as possible should handle samples.

The field sampler is personally responsible for the care and custody of the samples collected until they are transferred or dispatched properly. If custody of the samples (and sample bottles) is exchanged during field sampling, such transfer must be documented on the chain-of-custody form. The departing field staff should sign indicating the custody has been relinquished, and the arriving field staff should sign indicating responsibility for the custody of the samples.

If possible, chain-of-custody seals should be signed and dated, and the serial numbers listed on the chain-of-custody form. At least two seals should be used on each shipping container. Check with the Stantec project manager to determine if overnight courier pickup has been scheduled for the project site. If not, the field team should determine the nearest pickup (or drop-off) location.

Field staff should return their copy of the chain-of-custody form to the project office as soon as possible. If it is sent via U.S. mail or overnight courier, the field staff should keep another copy of the form until receipt by the project office has been confirmed.

The Project Manager determines whether the proper custody procedures were followed during the field work and decides if additional samples are required.

Transfer of Custody and Shipment - Samples are accompanied by a Chain-of-Custody Record. When transferring samples, the individuals relinquishing and receiving samples sign, date and note the time on the record. This record documents sample custody transfer. The original Chain-of-Custody form remains with the samples. Copies of the form following each sample transfer will be made and retained by the persons transferring the samples.

Samples are packaged properly for shipment and dispatched to the appropriate laboratory for analysis, with a Chain-of-Custody Record accompanying each shipment. The method of shipment, courier name(s), and other pertinent information are entered in the "Remarks" section of the Chain-of-Custody Record. Freight bills, postal service receipts and bills of lading are retained as part of the permanent documentation. Samples should be packed into a shipping container (usually a cooler) in a manner which will minimize potential breakage of sample bottles. This might include use of laboratory-supplied bubble wrap designed to fit the particular bottle, polystyrene chips, or vermiculite. The sampling technician should sign the chain-of-custody form relinquishing custody to the laboratory. If called for by the work plan, be sure the samples have been preserved and shipped with ice. If samples are shipped by overnight courier, record the airbill number on the chain-of-custody form in the comments section. The field sampling crew should keep one copy of the completed chain-of-custody form along with a copy of the airbill. The chain-of-custody form should be sealed inside the shipping container with the samples. The courier does not need to sign the chain-of-custody form if the shipping container remains unopened with the form inside. If ice is used to cool the samples during shipping, the paperwork should be sealed inside a Ziploc bag to prevent damage; ice should also be contained within Ziploc bags to limit leakage of water from the cooler. If samples are hand delivered to the laboratory by the field staff, the chain-of-custody form should be signed at the laboratory when the samples are delivered. If samples are hand delivered by the field staff, the shipping container does not need to be sealed as long as it is kept under proper chain-of-custody until delivered to the laboratory.

Laboratory Custody Procedures - A designated sample custodian accepts custody of the shipped sample and verifies that the information on the Sample Identification number matches that on the Chain-of-Custody Records, and that other information on the Chain-of-Custody record (such as courier names) is correct. The custodian then enters the sample identification number date into a bound log book, which cross-references field- and laboratory-assigned sample identification numbers.

The laboratory custodian uses the sample identification number or assigns a unique laboratory number to each sample and ensures that all samples are transferred to the proper analyst or stored in the appropriate secure area.

Laboratory personnel are responsible for the care and custody of samples from the time they are received until the sample is exhausted or returned to the custodian.

When sample analyses and necessary QA checks have been completed in the laboratory, the unused portion of the sample must be disposed of properly after a minimum period of 180 days after data is reported. All identifying tags, data sheets, and laboratory records are retained as part of the permanent documentation.

APPENDIX E

Opinion of Probable Cost

Appendix E - OPC for CAP Implementation
Corrective Action Plan
Yellow Barn Site
281 VT Route 15 W
Hardwick, VT 05836

Prepatory Costs	**Unit**	**Quantity**	**Unit Cost**	**Total Cost**
Meeting/Coordination with Contractor	LS	1	$ 300.00	$ 300.00
Site-specific Health and Safety Plan	LS	1	$ 1,000.00	$ 1,000.00
Project Management	LS	1	$ 1,000.00	$ 1,000.00
			Subtotal Prepatory Costs	$ 2,300.00

SS-1/SS-2/Septic System Soil Sampling	**Unit**	**Quantity**	**Unit Cost**	**Total Cost**
Soil Sampling	Day	2	$ 1,500.00	$ 3,000.00
Equipment and Field/Travel-Related Expenses	Day	2	$ 200.00	$ 400.00
Sample Analysis	LS	1	$ 2,000.00	$ 2,000.00
			Subtotal Sampling Costs	$ 5,400.00

Assumptions: Includes project kickoff meeting, 10 hours field time on-site, 1 hour project management, and 120 miles roundtrip mileage per day. Septic system sampling will include 10 locations for analysis of arsenic, cadmium, and lead, plus 1 duplicate QA/QC sample. SS-1/SS-2 sampling will include two locations for PAHs by EPA Method 8270 SIM, plus 1 duplicate QA/QC sample on 5-day turnaround from laboratory. Contractor costs for septic system excavation and removal not included in CAP cost as this is a task included in the site redevelopment plan and is not solely required for soil sample collection as part of the CAP.

Reporting	**Unit**	**Quantity**	**Unit Cost**	**Total Cost**
Corrective Action Construction Completion Report Preparation	LS	1	$ 5,000.00	$ 5,000.00
QA/QC Review	LS	1	$ 1,000.00	$ 1,000.00
Report Revisions	LS	1	$ 2,000.00	$ 2,000.00
			Subtotal Reporting Costs	$ 8,000.00

Assumptions: Includes one round of client and one round of regulator revisions.

TOTAL PROBABLE COST OF CAP TASKS, INCLUDING 20% CONTINGENCY: $18,840.00

OPTIONAL TASK BELOW TO BE IMPLEMENTED ONLY IF SOIL SAMPLE RESULTS INDICATE NEED FOR SOIL EXCAVATION AND OFF-SITE DISPOSAL

Impacted Soil Excavation and Off-site Disposal	**Unit**	**Quantity**	**Unit Cost**	**Total Cost**
Contractor Mob/Demob	LS	1	$ 1,500.00	$ 1,500.00
Contractor Soil Excavation and Stockpiling	Day	1	$ 3,800.00	$ 3,800.00
Contractor Soil Loading, Transportation and Disposal at VT-permitted Facility	Ton	113	$ 80.00	$ 9,040.00
Consultant Oversight of Soil Excavation, Stockpiling, Characterization, and Loading	Day	2	$ 1,500.00	$ 3,000.00
Stockpiled Soil Characterization Laboratory Analysis per Disposal Facility	LS	1	$ 1,000.00	$ 1,000.00
Confirmatory Soil Sample Analysis following Impacted Soil Excavation	LS	1	$ 1,000.00	$ 1,000.00
Project Management including interaction with Disposal Facility, Regulators, Client	LS	1	$ 1,000.00	$ 1,000.00
Reporting (add-on to reporting in soil sampling task)	LS	1	$ 2,000.00	$ 2,000.00
			Subtotal Soil Disposal Costs	$ 22,340.00

Assumptions: Includes project kickoff meeting, 10 hours field time on-site per day, 1 hour project management per day, soil is determined to be non-hazardous for disposal purposes, maximum of 113 tons (75 cubic yards) of soil is disposed, five confirmatory soil samples collected after impacted soil is excavated, only one soil characterization soil sample is required by disposal facility.

TOTAL PROBABLE COST OF CAP TASKS IF SOIL DISPOSAL REQUIRED, INCLUDING 20% CONTINGENCY: $45,648.00